APPENDIX A
Shade/Shadow Study

Shade | Shadow Study

Arroyo Village Residential Condominium Project

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EXECUTIVE SUMMARY

The purpose of this Shade/Shadow Study (Study) is to describe the existing sunlight exposure and shade/shadow conditions at the proposed Arroyo Village Residential Condominium Project ("project") site and in the immediate vicinity, as well as analyzing the introduction of new sources of shade/shadow associated with the proposed project. The proposed project is located at 235 South Arroyo Drive in the City of San Gabriel (Assessor's Parcel Numbers [APNs] 5346-011-001, -011-004, and -011-006). A limited portion of the project site is located in the City of Alhambra at APNs 5346-008-031, -009-008, and -009-010. The project site is situated within the City of San Gabriel's Mission District Specific Plan.

The project site encompasses approximately 1.16 acres (50,343 square feet) and has an irregular shape. The northern portion of the project site is currently developed with an existing two-story single-family residential building totaling approximately 2,895 square feet. The Los Angeles County Flood Control District-owned Alhambra Wash traverses the project site in a northeast to southeast direction. The remainder of the project site is vacant land. On-site topography varies and slopes to the southeast and southwest toward the wash.

Overall, the project proposes to demolish the existing on-site single-family residential building in order to construct a new four-story residential building (up to 48 feet in height from top of plate). The building would have 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. A vehicular bridge with a pedestrian walkway would be installed at the southern portion of the project site to provide project access at South Arroyo Drive. The access bridge over the wash would include two lanes for vehicular ingress and egress directly to the parking garage. The project would require a total of 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide four surface-level parking spaces.

The proposed project would result in new shadows cast onto surrounding residential uses and roads, as well as the Alhambra Wash. As discussed in Section 4.1, *Thresholds of Significance*, a significant impact would result if shadow-sensitive use areas (where sunlight is important to its function, such as outdoor backyard spaces for residences) would be shaded by project-related structures for more than three hours between 9:00 a.m. and 3:00 p.m. Pacific Standard Time (between late October and early April), or for more than four hours between 9:00 a.m. and 5:00 p.m. Pacific Daylight Time (between early April and late October), compared to existing conditions.

Early April to Late October

Summer Months. The proposed project would cast minimal shadows onto single-family residential uses to the north during the morning (9:00 a.m.) hour. During the mid-day (12:00 p.m.) hour, shadows cast by the proposed project would primarily be contained within the project's boundary, except for a small portion of the Alhambra Wash to the east. During the afternoon (3:00 p.m.) hour, shadows cast by the proposed project would nominally be cast onto the Alhambra Wash to the east. Shadows cast during the evening (6:00 p.m.) hour would spill onto the Alhambra Wash, South Arroyo Drive, and a small portion of a residential front yard area to the east. The project would not result in the shading of any shadow-sensitive uses for more than four hours between 9:00 a.m. and 5:00 p.m. Thus, during the summer months, surrounding uses would not experience significant shadow impacts as a result of the proposed project.

Fall Months. The proposed project would cast shade to off-site uses for greater than four hours between the hours of 9:00 a.m. and 6:00 p.m. during the fall months. The narrow and limited side/back yard area associated with the residential use to the north would be shaded for more than four hours between 9:00 a.m. and 6:00 p.m. However, this area is not considered a shadow-sensitive use (as sunlight is not important to its function). This shaded area is utilized for side yard, driveway, and garage uses and therefore is not considered a routinely usable outdoor space, where sunlight is important to its function. Further, this area already experiences shading under existing conditions. Thus, during the fall months, surrounding uses would not experience significant shadow impacts as a result of the proposed project.

Late October to Early April

Winter Months. The proposed project would cast shade for greater than three hours between 9:00 a.m. and 3:00 p.m. at off-site areas in the winter months. These areas shaded for more than three hours include the side/back yard area, paved driveway, detached garage, and residential structure associated with the single-family residential use to the north, as well as a small portion of the Alhambra Wash to the east. These areas are not considered shadow-sensitive (as sunlight is not important to their function) and/or routinely usable outdoor spaces. In addition, the areas associated with the single-family residential use to the north experience shading under existing conditions as a result of the residential and ancillary structures at the residential use to the north. Therefore, the project would not result in significant shade/shadow impacts during the winter months.

Spring Months. The proposed project would cast shadows onto the front and side/back yard area associated with the residence to north of the project site for greater than three hours between 9:00 a.m. and 3:00 p.m. during the spring months. These narrow and limited areas are not considered shadow-sensitive (as sunlight is not important to their function). This shaded area is utilized for side yard, driveway, and garage uses, and therefore is not considered routinely useable outdoor space where sunlight is important to its function. Further, this area already experiences shading under existing conditions as a result of the residential and ancillary structures at the residential use to the north. Therefore, the project would not result in significant shade/shadow impacts during the spring months.

As discussed above, the proposed project would not result in significant shading of the any shadow-sensitive uses for more than three hours between 9:00 a.m. and 3:00 p.m. Pacific Standard Time (between late October and early April), or for more than four hours between 9:00 a.m. and 5:00 p.m. Pacific Daylight Time (between early April and late October). Although the side/back yard area, paved driveway, and residential structure to the north and a small portion of the Alhambra Wash would experience significant shading as a result of the project, these uses are not considered shadow-sensitive (as these areas are not dependent on sunlight for its function, and these areas are not routinely usable outdoor spaces). As discussed, the majority of the areas associated with the residence to the north are utilized for side yard, driveway, and garage uses and therefore are not considered routinely useable outdoor space where sunlight is important to its function. Further, this area already experiences shading under existing conditions. As such, a less than significant shade/shadow impact would occur with implementation of the proposed project.

Shading of On-Site Courtyard

The proposed project includes a central courtyard to be used by on-site residents. During the summer months, the on-site courtyard area would experience some shading during the morning, afternoon, and evening hours, but would receive sunlight in the majority of the courtyard for most of the day. During the fall months, the on-site courtyard area would be completely shaded during the morning and evening hours and would be partially shaded during the mid-day and afternoon hours. This area would be shaded at all hours during the winter months. During the spring months, this area would be fully shaded during the morning hours and would be partially shaded during the mid-day and afternoon hours.

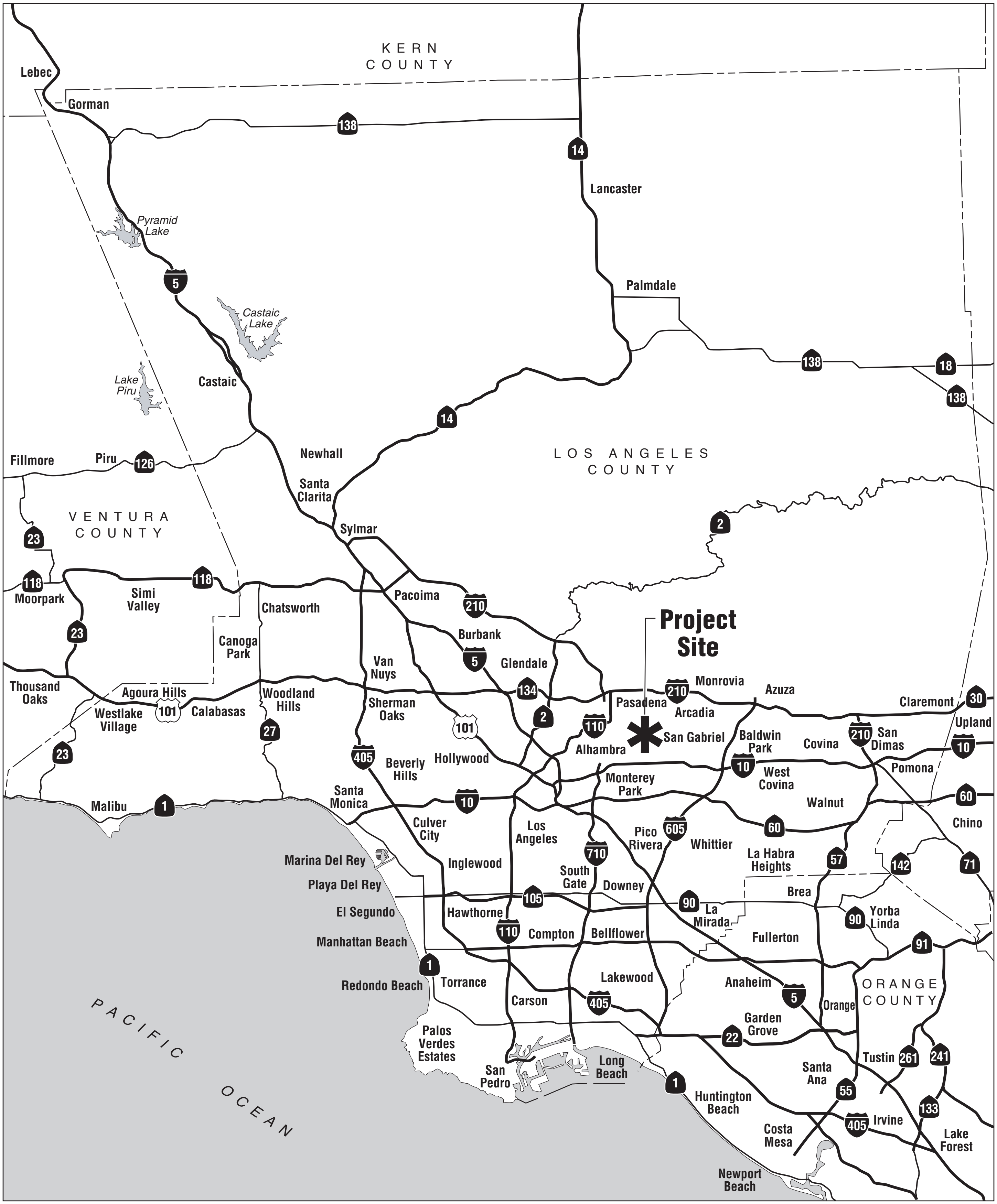
1.0 PURPOSE OF THE STUDY

The purpose of this Shade/Shadow Study (Study) is to describe the existing sunlight exposure and shade/shadow conditions at the proposed Arroyo Village Residential Condominium Project (project) site and in the immediate vicinity, as well as analyzing the introduction of new sources of shade/shadow associated with the proposed project. The information upon which this Study is based was compiled from site photographs, Google Earth 2018 satellite imagery, and shade/shadow diagrams prepared by Digital Preview in May 2019 for both the existing and proposed conditions.

1.1 PROJECT LOCATION/SETTING

The City of San Gabriel (City) is located in the San Gabriel Valley of Los Angeles County, approximately 11 miles east of the Los Angeles Civic Center; refer to Exhibit 1, *Regional Vicinity*. The City consists of 4.09 square miles. Surrounding jurisdictions include the cities of San Marino and Temple City to the north, Temple City, unincorporated County of Los Angeles, and Rosemead to the east, Rosemead to the south, and Alhambra to the west.

The proposed project site is approximately 1.16 acres and is located at 235 South Arroyo Drive in the City of San Gabriel (APNs 5346-011-001, -011-004, and -011-006); refer to Exhibit 2, *Site Vicinity*. A limited portion of the project site is located in the City of Alhambra at APNs 5346-008-031, -009-008, and -009-010. Regional access to the project site is provided via the San Bernardino Freeway (Interstate 10) or the Foothill Freeway (Interstate 210). Local access to the project site is provided by Arroyo Drive.



SHADE / SHADOW STUDY

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Regional Vicinity

Exhibit 1

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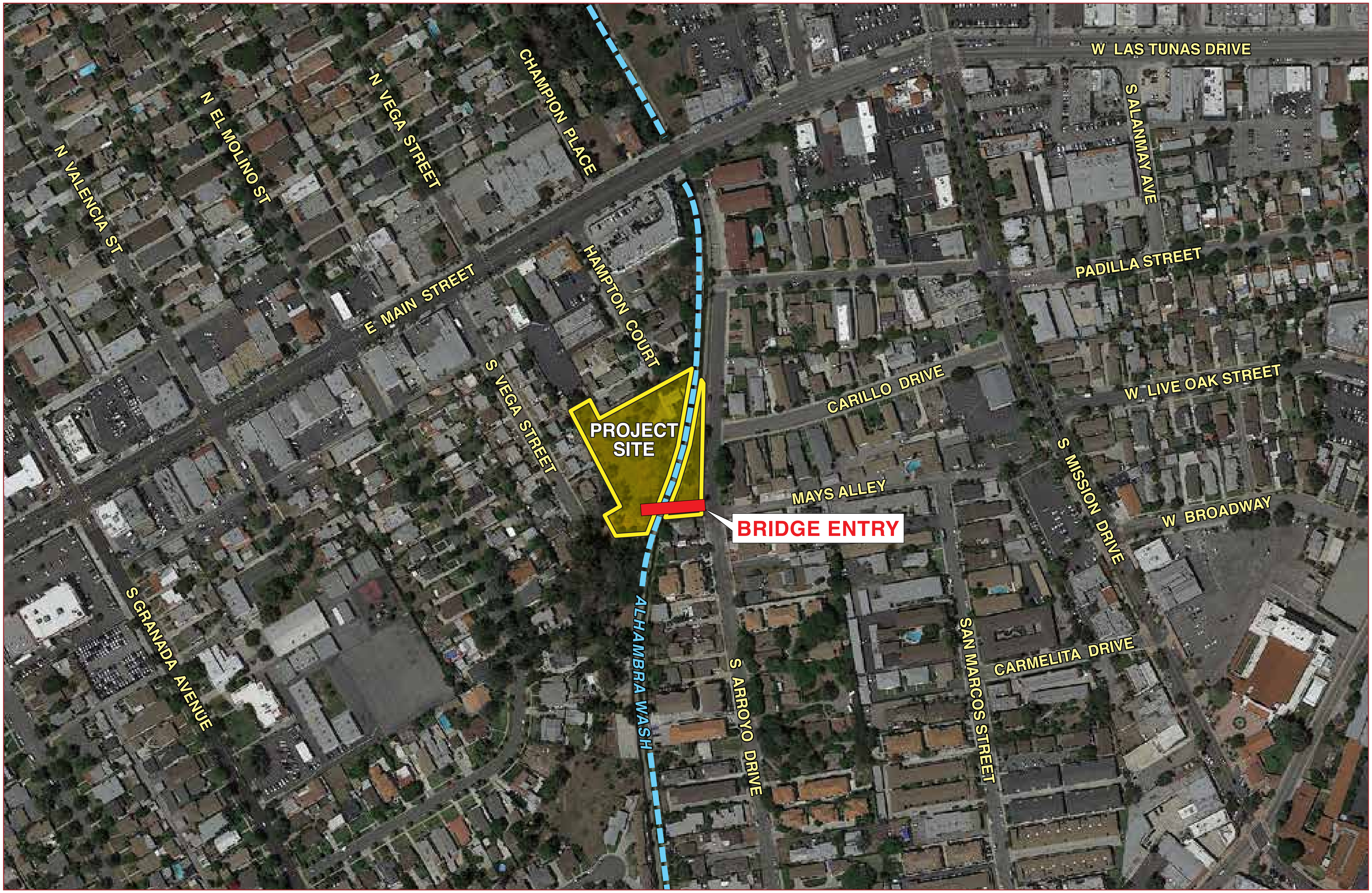

Source: Google Earth, April 2019.

SHADE / SHADOW STUDY
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Site Vicinity

NOT TO SCALE

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Exhibit 2

The northern portion of the project site is currently developed with an existing two-story single-family residential building totaling approximately 2,895 square feet. The Los Angeles County Flood Control District-owned Alhambra Wash traverses the project site in a northeast to southeast direction. The remainder of the project site is vacant land. The project site topography varies and slopes to the southeast and southwest toward the wash.

1.2 PROJECT DESCRIPTION

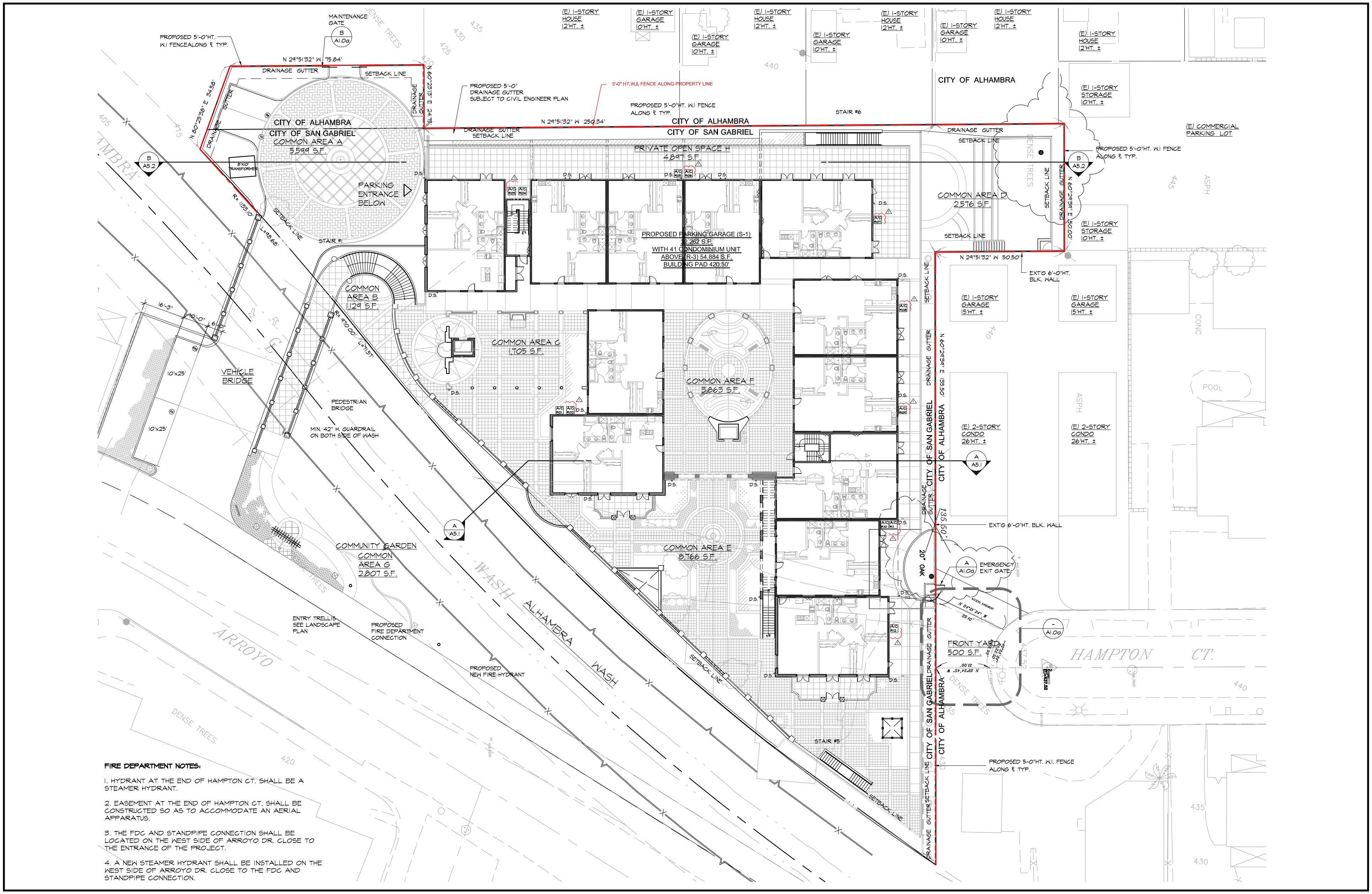
Overall, the project proposes to demolish the existing on-site single-family residential building in order to construct a new four-story residential building (up to 48 feet in height from top of plate). The building would have 41 condominium units totaling approximately 55,000 square feet with a 36,000-square foot underground parking garage; refer to Exhibit 3, *Conceptual Site Plan*. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. A vehicular bridge with a pedestrian walkway would be installed at the southern portion of the project site to provide project access at South Arroyo Drive. The access bridge over the wash would include two lanes for vehicular ingress and egress directly to the parking garage. The project would require a total of 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide four surface-level parking spaces.

2.0 METHODOLOGY

Shading refers to the effect of shadows cast upon adjacent areas by proposed structures. Consequences of shadows upon land uses may be positive, including cooling effects during warm weather, or negative, such as the loss of natural light necessary for solar energy purposes or the loss of warming influences during cool weather. Shadow effects are dependent upon several factors, including the local topography, the height and bulk of the project's structural elements, sensitivity of adjacent land uses, season, and duration of shadow projection. Facilities and operations sensitive to the effects of shading include: routinely usable outdoor spaces associated with residential, recreational, or institutional (e.g., schools, convalescent homes) land uses; commercial uses such as pedestrian-oriented outdoor spaces or restaurants with outdoor eating areas; nurseries; and existing solar collectors. These uses are considered sensitive because sunlight is important to function, physical comfort, or commerce.

To identify the proposed project's potential shadow-related impacts, existing and project-generated morning, mid-day, afternoon, and evening shade patterns were compared for each of the four seasons. Specifically, four dates were used for analysis purposes:

- Winter and summer solstices (December 21 and June 21), when the sun is at its lowest and highest point, respectively, and
- Spring and fall equinoxes (March 21 and September 21), when day and night are of approximately equal length.



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

SHADE / SHADOW STUDY
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Site Plan

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Exhibit 3

The longest shadows are cast during the winter months and the shortest shadows are cast during the summer months. The following discussion describes the summer/winter solstice and vernal/autumnal equinox phenomenon, local topography, and some general assumptions that affect shadow patterns in the project vicinity. Note that the analysis considers shadow effects associated with proposed building massing only and the shadow patterns associated with proposed landscaping are not addressed.

SUMMER AND WINTER SOLSTICE

"Solstice" is defined as either of the two points on the ecliptic that lie midway between the equinoxes (separated from them by an angular distance of 90°). At the solstices, the sun's apparent position on the celestial sphere reaches its greatest distance above or below the celestial equator, about 23.5° of the arc. At the time of summer solstice, approximately June 21, the sun is directly overhead at noon at the Tropic of Cancer. In the Northern Hemisphere, the longest day and shortest night of the year occur on this date, marking the beginning of summer. At winter solstice, approximately December 21, the sun is overhead at noon at the Tropic of Capricorn; this marks the beginning of winter in the Northern Hemisphere. Measuring shadow lengths for the winter and summer solstices represents the extreme shadow patterns that occur throughout the year. Shadows cast on the summer solstice are the shortest shadows during the year, becoming progressively longer until winter solstice when the shadows are the longest they are all year.

VERNAL AND AUTUMNAL EQUINOX

An equinox is the moment when the sun passes over the equator. The event occurs twice a year, approximately March 21 and September 21. The equinoxes are the two days each year when the middle of the sun is an equal amount of time above and below the horizon for every location on Earth. In the Northern Hemisphere, the March equinox is known as the vernal equinox and the September equinox is the autumnal equinox. In the Southern Hemisphere, the names are reversed. In practice, at the equinox, the day is longer than the night.

The equinoxes can be interpreted as virtual points in the sky. As Earth moves around the sun, the apparent position of the sun relative to the other stars moves in a full circle over the period of a year. This circle is called the ecliptic, and is also the plane of Earth's orbit projected against the whole sky. Other bright planets like Venus, Mars, and Saturn also appear to move along the ecliptic, because their orbits are in a similar plane to Earth's. Another virtual circle in the sky is the celestial equator, or the projection of the plane of Earth's equator against the whole sky. Because Earth's axis of rotation is tilted relative to the plane of Earth's orbit around the sun, the celestial equator is inclined to the ecliptic by about 23.5°.

SHADE/SHADOW DIAGRAMS

The shade/shadow diagrams are composed of a series of three-dimensional rendered site plans. The site plans consist of the project massing models, as well as the surrounding context and geography. Upon receiving the electronic site plan files (AutoCAD) and project description, a 3D model is created to the correct heights. The 3D model is then merged with an ortho-rectified aerial photograph into AutoCAD at the correct coordinates, creating a base for the model. The existing surrounding buildings are modeled to height and included with the project model. The model is then set to include the model location, times, and dates, and then the shadow conditions are rendered. The model illustrates the shadow effects of existing building and new buildings proposed as part of the project application. The orientation of the model was set to represent the orientation of the project site. Dates selected for each season were: summer/winter solstices and the vernal/autumnal equinoxes. For each of those days selected, the time periods were 9:00 a.m., 12:00 p.m., and 3:00 p.m., as well as 6:00 p.m. (for summer solstice and autumnal equinox only).

3.0 EXISTING CONDITIONS

The northern portion of the project site is currently developed with an existing two-story single-family residential building totaling approximately 2,895 square feet. The Los Angeles County Flood Control District-owned Alhambra Wash traverses the project site in a northeast to southeast direction. The remainder of the project site is vacant land.

The project site is generally located within a developed area of the City, surrounded by the following land uses:

- North: High density single- and multi-family residential (up to two stories in height) and commercial/office uses are located to the north of the project site;
- East: The Alhambra Wash bounds the project site to the east with multi-family residential uses located east of the Alhambra Wash;
- South: Areas to the south of the project site include vacant land associated with the Alhambra Wash; and
- West: Areas to the west of the project site are located within the City of Alhambra's jurisdiction and include single-family residential uses.

3.1 CLIMATE

The general region lies in the semipermanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The climate consists of a semiarid environment with mild winters, warm summers, moderate temperatures, and comfortable humidity. Precipitation is limited to a few winter storms. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The average annual temperature varies little throughout the area (which encompasses the project site), averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the project's geographical area show greater variability in annual minimum and maximum temperatures. All portions of the area have had recorded temperatures over 100°F in recent years.

Although the project's geographical area has a semi-arid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the area by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. The local climate is typically warm during summer when temperatures tend to be in the 80s and cool during winter when temperatures tend to be in the 60s. The warmest month of the year is August with an average maximum temperature of 87 degrees Fahrenheit, while the coldest month of the year is December with an average minimum temperature of 44 degrees Fahrenheit. The annual average precipitation in San Gabriel is 18.06 inches. Rainfall occurs most frequently in February, with an average rainfall of 4.66 inches.[1]

3.2 EXISTING SHADOW-SENSITIVE USES

As noted above, facilities and operations sensitive to the effects of shading include: routinely usable outdoor spaces associated with residential, recreational, or institutional (e.g., schools, convalescent homes) land uses; commercial uses such as pedestrian-oriented outdoor spaces or restaurants with outdoor eating areas; nurseries; and existing solar collectors. Shadow-sensitive uses in the vicinity of the project site include single-family residential yard areas surrounding the project site. These areas are dependent on sunlight for the physical comfort of this use (outdoor space for residence).

3.3 EXISTING SHADE/SHADOW CONDITIONS

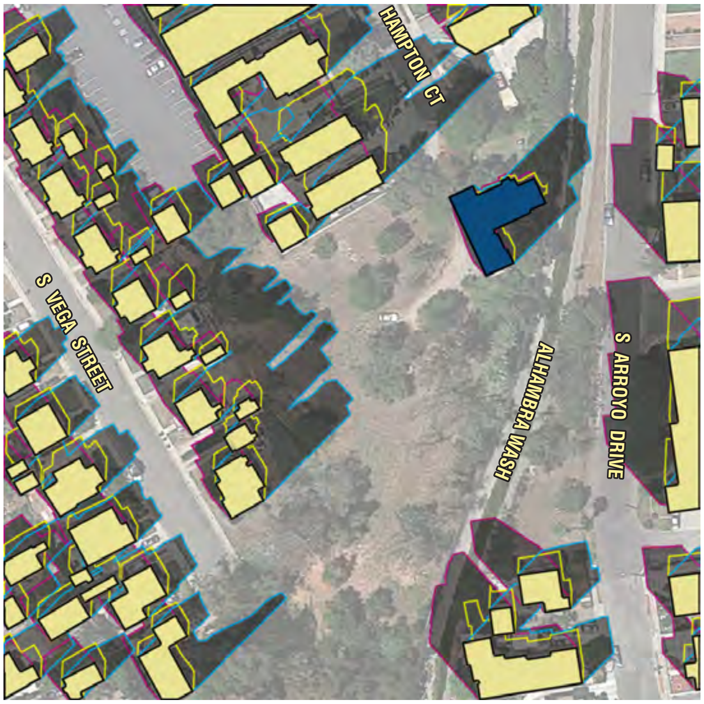
A two-story residential building, vacant land, and areas with mature vegetation currently present within the boundaries of the project site. The Alhambra Wash traverses the project site in a northeast-southwest direction. Existing shade/shadow diagrams were created for the existing two-story residential structure within the project site. The following describes the existing shadow conditions of the project site during the summer/winter solstices and the vernal/autumnal equinoxes.

Winter Solstice. During the winter solstice, shadows cast by the on-site residential building from 9:00 a.m. to 3:00 p.m. are confined to the boundaries of the project site, although a small portion of the Alhambra Wash to the northeast/east is shaded during the afternoon hour (3:00 p.m.); refer to Exhibit 4, *Existing Shade/Shadow Patterns*. This shaded area at the Alhambra Wash to the east/northeast is not considered shadow-sensitive. The existing on-site residential structure does not currently shade any sensitive uses during the winter solstice; refer to Exhibit 4.

Vernal Equinox. Shadows cast by the existing on-site residential structure during the vernal equinox are similar to the shadows cast during the winter solstice, although to a lesser extent. Shadows cast between 9:00 a.m. and 3:00 p.m. during the vernal equinox are predominantly confined to the boundaries of the project site. However, a small portion of the Alhambra Wash

[1] The Weather Channel, *San Gabriel, CA Monthly Weather*, https://weather.com/weather/monthly/l/72c00ef93e5739c7c8de446fb391b845057190926d9522da9ba4aa6ada34493a, accessed May 6, 2019.

Late October to Early April



Winter Solstice

Vernal Equinox

Early April to Late October

Summer Solstice

Autumnal Equinox

LEGEND

- 9 a.m. Shadow Pattern
- 12 p.m. Shadow Pattern
- 3 p.m. Shadow Pattern
- 6 p.m. Shadow Pattern

Note: Based on the daytime lighting conditions throughout the year, the Summer Solstice and Autumnal Equinox shadow patterns are represented from 9:00 a.m. and 6:00 p.m. and the Winter Solstice and Vernal Equinox shadow patterns are represented from 9:00 a.m. to 3:00 p.m.

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SHADE / SHADOW STUDY • ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Existing Shade/Shadow Patterns

Exhibit 4

to the east is shaded during the afternoon (3:00 p.m.) hour. No shadows-sensitive uses are currently shaded by the on-site residential structure during the vernal equinox; refer to Exhibit 4.

Summer Solstice. During the summer solstice, shadows cast between the morning (9:00 a.m.) and afternoon (3:00 p.m.) hours from the on-site single-family residential building would be predominantly contained within the boundaries of the project site, although a small portion of the Alhambra Wash to the east would be shaded during the afternoon (3:00 p.m.) hour; refer to Exhibit 4. During the evening (6:00 p.m.) hour, more extensive shadows are cast onto the Alhambra Wash to the east. However, the Alhambra Wash is not considered a shadow-sensitive use. The existing on-site residential structure does not currently shade any sensitive uses during the summer solstice.

Autumnal Equinox. Shadows cast from the on-site single-family residential building are fully contained within the project site between the morning (9:00 a.m.) and mid-day (12:00 p.m.) hours. Shadows are nominally cast onto the Alhambra Wash to the east during the afternoon (3:00 p.m.) hour; refer to Exhibit 4. Shadows from the on-site single-family residential building are further cast onto the Alhambra Wash and South Arroyo Drive to the east during the evening (6:00 p.m. hour). The Alhambra Wash and South Arroyo Drive are not considered shadow-sensitive uses. Combined shadows from the on-site residential structure and off-site residential structures to the northwest cast shadows onto the Alhambra Wash, South Arroyo Drive, and residential uses to the east during the evening hour. However, the Alhambra Wash and South Arroyo Drive are not considered shadow-sensitive uses and the residential uses to the east are not shaded for more than four hours. Shadow patterns cast by the existing on-site residential building do not shade any off-site shadow-sensitive uses for more than four hours during the autumnal equinox.

4.0 SHADE/SHADOW ANALYSIS

4.1 THRESHOLDS OF SIGNIFICANCE

A project would have a significant impact pertaining to the degradation of character/quality if it would substantially block surrounding shadow-sensitive areas. Since the City of San Gabriel does not have a specific adopted threshold to determine whether or not increased shade/shadow patterns are considered significant, Michael Baker International has utilized the City of Los Angeles' adopted threshold. Further, the urbanized character of the City is similar to that of Los Angeles (pertaining to potential shade/shadow concerns) and Los Angeles is one of the few cities in southern California with an adopted threshold of significance for shade/shadow impacts. Thus, for the purposes of this analysis, a project would have a significant impact if:

- Shadow-sensitive use areas (where sunlight is important to its function) would be shaded by project-related structures for more than three hours between the hours of 9:00 a.m. and 3:00 p.m. Pacific Standard Time (between late October and early April), or for more than four hours between the hours of 9:00 a.m. and 5:00 p.m. Pacific Daylight Time (between early April and late October), compared to existing conditions.[2]

[2] City of Los Angeles, *L re d u de*, 2006.

For the purposes of this analysis, facilities and operations sensitive to the effects of shading include: routinely useable outdoor spaces associated with residential, recreational, or institutional (e.g., schools, convalescent homes) land uses; commercial uses such as pedestrian-oriented outdoor spaces or restaurants with outdoor eating areas; nurseries; and existing solar collectors. These uses are considered sensitive because sunlight is important to function, physical comfort, or commerce.

4.2 IMPACTS AND MITIGATION MEASURES

SS-1 ***Result in shading of shadow-sensitive use areas (where sunlight is important to its function) by project-related structures for more than three hours between the hours of 9:00 a.m. and 3:00 p.m. Pacific Standard Time (between late October and early April), or for more than four hours between the hours of 9:00 a.m. and 5:00 p.m. Pacific Daylight Time (between early April and late October), compared to existing conditions?***

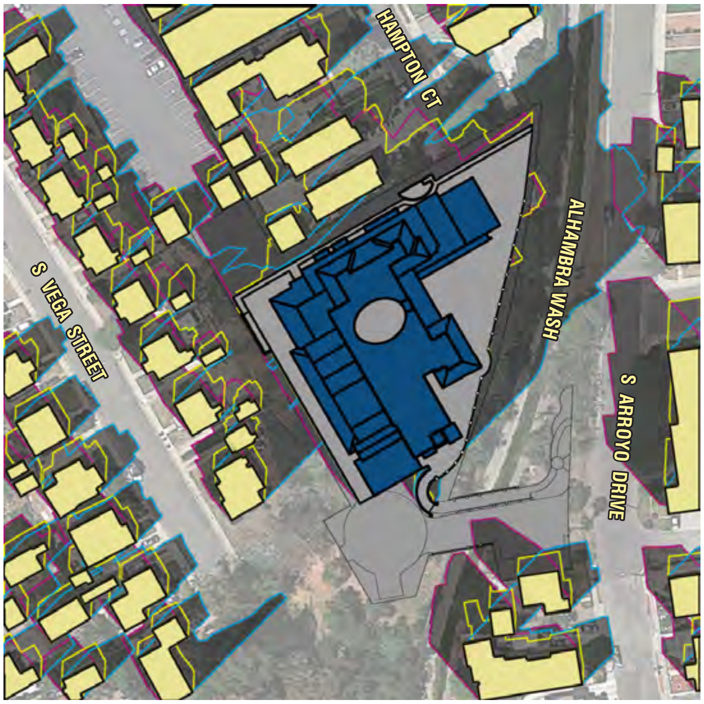
Level of Significance Before Mitigation: *Less Than Significant Impact.*

The proposed project would demolish the existing on-site single-family residential building and construct a new 55,000 square-foot, four-story residential building encompassing 41 condominium units. Construction of the new four-story building would cast shadows on nearby residential uses. The following analysis describes the shadow conditions from the proposed project onto surrounding uses during the summer/winter solstices and the vernal/autumnal equinoxes.

Winter Solstice. On December 21, shadows are widespread within and around the project site from the morning (9:00 a.m.) to the afternoon (3:00 p.m.) hours; refer to Exhibit 5, *Proposed Shade/Shadow Patterns*. Morning shadows (9:00 a.m.) would spill onto the residential front and side yard areas, paved driveway/parking areas, and residential structures to the north, as well as a small portion of the Alhambra Wash to the east.

At mid-day (12:00 p.m.), shadows cast from the project site would be similar to those cast during the morning hour. Shadows cast during the afternoon (3:00 p.m.) would also cast onto the front and narrow and limited side/back yard areas, and the paved driveway at residential uses to the north; refer to Exhibit 5. Shadows would also be cast onto Hampton Court to the north, and the Alhambra Wash and South Arroyo Drive to the northeast/east during the afternoon (3:00 p.m.) hour. Hampton Court, the Alhambra Wash, and South Arroyo Drive are not considered shadow-sensitive uses. As noted above, the front and side/back yard areas associated with the residences to the north of the project site would be shaded for more than three hours between the morning (9:00 a.m.) and afternoon (3:00 p.m.). These areas are not considered shadow-sensitive, as sunlight is not important to its function, and these areas are not considered routinely outdoor usable spaces. The majority of these areas are utilized for driveway and garage uses. In addition, a portion of front and side/back yards currently experience shading as a result of the existing

Late October to Early April

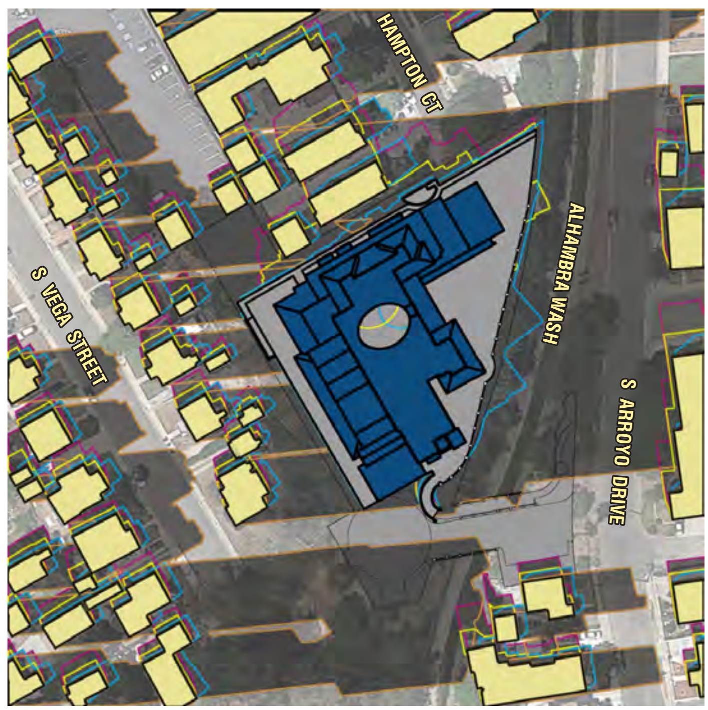


Winter Solstice

Vernal Equinox

Early April to Late October

Summer Solstice



Autumnal Equinox

LEGEND

- 9 a.m. Shadow Pattern
- 12 p.m. Shadow Pattern
- 3 p.m. Shadow Pattern
- 6 p.m. Shadow Pattern

Note: Based on the daytime lighting conditions throughout the year, the Summer Solstice and Autumnal Equinox shadow patterns are represented from 9:00 a.m. and 6:00 p.m. and the Winter Solstice and Vernal Equinox shadow patterns are represented from 9:00 a.m. to 3:00 p.m.

Proposed Shade/Shadow Patterns

Exhibit 5

residential structure and existing ancillary structure at the residential use to the north; refer to Exhibit 4. A less than significant impact would occur in this regard.

Vernal Equinox. Shadows generated by the proposed project on March 21, when the sun shines at a moderate angle at noon, would cast shadows to the north, northeast, east, west, and northwest between the hours of 9:00 a.m. and 3:00 p.m.; refer to Exhibit 5. The proposed project would cast shadows onto the front and side/back yard area associated with the single-family residential use to the north of the project site during the morning (9:00 a.m.) and mid-day (12:00 p.m.) hours. During the afternoon (3:00 p.m.) hour, shadows cast by the proposed project would primarily be contained within the project's boundary, except for a small portion of the Alhambra Wash to the east.

As seen on Exhibit 5, the project would cast shadows onto the front and narrow and limited side/back yard area of the single-family residential use to the north for greater than three hours between 9:00 a.m. and 3:00 p.m. during the spring months. The areas shaded for more than three hours include the front and side/back yard area associated with the residence to north of the project site. However, this area is not considered shadow-sensitive (as sunlight is not important to their function). This shaded area is utilized for side yard, driveway, and garage uses and therefore is not considered a routinely usable outdoor space where sunlight is important to its function. Further, the areas associated with the single-family residential use to the north experience shading under existing conditions as a result of the residential and ancillary structures at the residential use to the north. A less than significant impact would occur in this regard.

Summer Solstice. During the summer solstice, shadows would be cast onto the single-family residential use to the north during the morning hour (9:00 a.m.). During the mid-day hour (12:00 p.m.), shadows cast by the proposed project would be completely confined within the boundaries of the project site, except for a small portion of the Alhambra Wash to the east. Shadows cast during the afternoon (3:00 p.m.) would be similar to the mid-day (12:00 p.m. hour), with limited spillover onto the Alhambra Wash to the east. Shadows cast during the evening (6:00 p.m.) hour would spill onto the Alhambra Wash, South Arroyo Drive, and a small portion of a residential front yard area to the east. As shown in Exhibit 5, shadows cast by the project during summer solstice would not shade any off-site shadow-sensitive uses for more than four hours. A less than significant impact would occur in this regard.

Autumnal Equinox. Shadows generated by the proposed project on September 21 would occur when the sun shines at a moderate angle at noon and would cast shadows to the north, east, and southeast between the hours of 9:00 a.m. and 6:00 p.m.; refer to Exhibit 5. Morning shadows (9:00 a.m.) would spill onto the front and side/back yard areas, paved driveway, detached garage, and residential structure associated with the single-family residential use to the north. At mid-day (12:00 p.m.), shadows cast by the project would be similar to those cast in the morning hour, although to a lesser extent.

During the afternoon hour (3:00 p.m.), shadows cast by the proposed project would primarily be contained within the project's boundary, except for a small portion of the Alhambra Wash to the east. During the evening (6:00 p.m.) hour, shadows would be cast onto Alhambra Wash, South

Arroyo Drive and a small portion of residential uses to the east. As seen in Exhibit 5, the project would cast shade to off-site uses for greater than four hours between the hours of 9:00 a.m. and 6:00 p.m. during the fall months. Specifically, the narrow and limited side/back yard area associated with the residential use to the north would be shaded for more than four hours between 9:00 a.m. and 6:00 p.m. However, this area is not considered a shadow-sensitive use (as sunlight is not important to its function). This shaded area is utilized for side yard, driveway, and garage uses and therefore is not considered a routinely useable outdoor space where sunlight is important to its function. Further, this area already experiences shading under existing conditions. Thus, during the fall months, surrounding uses would not experience significant shadow impacts as a result of the proposed project.

Impact Conclusion

The proposed project would result in new shadows cast onto surrounding residential uses, as well as onto the Alhambra Wash, adjacent roadways, and sidewalks. As discussed in Section 4.1, *Thresholds of Significance*, a significant impact would result if shadow-sensitive use areas (where sunlight is important to its function) would be shaded by project-related structures for more than three hours between 9:00 a.m. and 3:00 p.m. Pacific Standard Time (between late October and early April), or for more than four hours between 9:00 a.m. and 5:00 p.m. Pacific Daylight Time (between early April and late October), compared to existing conditions.

Early April to Late October

Summer Months. As illustrated on Exhibit 5, the proposed project would cast minimal shadows onto single-family residential uses to the north during the morning (9:00 a.m.) hour. During the mid-day (12:00 p.m.) hour, shadows cast by the proposed project would primarily be contained within the project's boundary, except for a small portion of the Alhambra Wash to the east. During the afternoon (3:00 p.m.) hour, shadows cast by the proposed project would nominally be cast onto the Alhambra Wash to the east. Shadows cast during the evening (6:00 p.m.) hour would spill onto the Alhambra Wash, South Arroyo Drive, and a small portion of a residential front yard area to the east. As shown in Exhibit 5, the project would not result in the shading of any shadow-sensitive uses for more than four hours between 9:00 a.m. and 5:00 p.m. Thus, during the summer months, surrounding uses would not experience significant shadow impacts as a result of the proposed project.

Fall Months. As illustrated on Exhibit 5, the proposed project would cast shade to off-site uses for greater than four hours between the hours of 9:00 a.m. and 6:00 p.m. during the fall months. The narrow and limited side/back yard area associated with the residential use to the north would be shaded for more than four hours between 9:00 a.m. and 6:00 p.m. However, this area is not considered a shadow-sensitive use (as sunlight is not important to its function). This shaded area is utilized for side yard, driveway, and garage uses and therefore is not considered a routinely useable outdoor space where sunlight is important to its function. Further, this area already experiences shading under existing conditions. Thus, during the fall months, surrounding uses would not experience significant shadow impacts as a result of the proposed project.

Late October to Early April

Winter Months. As illustrated on Exhibit 5, the proposed project would cast shadows for greater than three hours between 9:00 a.m. and 3:00 p.m. at off-site areas in the winter months. These areas shaded for more than three hours include the side/back yard area, paved driveway, and detached garage, and residential structure associated with the single-family residential use to the north, as well as a small portion of the Alhambra Wash to the east. These areas are not considered shadow-sensitive (as sunlight is not important to their function) and/or routinely usable outdoor spaces. In addition, the areas associated with the residential use to the north experience shading under existing conditions as a result of the residential and ancillary structures at the single-family residential use to the north. Therefore, the project would not result in significant shade/shadow impacts during the winter months.

Spring Months. As illustrated on Exhibit 5, the proposed project would cast shadows onto the front and side/back yard area associated with the residence to north of the project site for greater than three hours between 9:00 a.m. and 3:00 p.m. during the spring months. These narrow and limited areas are not considered shadow-sensitive (as sunlight is not important to their function). This shaded area is utilized for side yard, driveway, and garage uses and therefore is not considered routinely usable outdoor space where sunlight is important to its function. In addition, the areas associated with the single-family residential use to the north experience shading under existing conditions as a result of the residential and ancillary structures at the residential use to the north. Therefore, the project would not result in significant shade/shadow impacts during the spring months.

As discussed above, the proposed project would not result in significant shading of the any shadow-sensitive uses for more than three hours during the winter and spring months, and for more than four hours during the fall and summer months. Although the side/back yard area, paved driveway, and residential structure to the north as well as a small portion of the Alhambra Wash to the east would experience significant shading as a result of the project during the winter months, these uses are not considered shadow-sensitive (as these areas are not dependent on sunlight for its function, and these areas are not routinely usable outdoor spaces). As discussed, the majority of the areas associated with the residence to the north are utilized for side yard, driveway, and garage uses and therefore are not considered routinely useable outdoor space where sunlight is important to its function. Further, this area already experiences shading under existing conditions. As such, a less than significant shade/shadow impact would occur with implementation of the proposed project.

Shading of On-Site Courtyard

The proposed project includes a central courtyard to be used by on-site residents. As shown on Exhibit 5, the on-site courtyard area would experience some shading during the morning, afternoon, and evening hours, but would receive sunlight in the majority of the courtyard for most of the day during the summer months. During the fall months, the on-site courtyard area would be completely shaded during the morning and evening hours and would be partially shaded during the mid-day and afternoon hours. This area would be shaded at all hours during the winter months. During the spring months, this area would be fully shaded during the morning hours and would be partially shaded during the mid-day and afternoon hours.

Mitigation Measures: No mitigation measures are required.

5.0 REFERENCES

5.1 PREPARERS

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Richard Johnston, Simulation Specialist (Digital Preview)

5.2 DOCUMENTS

1. City of Los Angeles, *L.A. CEQA Thresholds Guide*, 2006.

2. City of San Gabriel, *The Comprehensive General Plan of the City of San Gabriel, California*, adopted by Resolution No. 04-16, May 18, 2004.

3. City of San Gabriel, *San Gabriel Municipal Code*, current though Ordinance 650, passed February 5, 2019.

4. Design Inspiration Group, Inc., *AutoCAD files*, multiple dates.

5. Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

5.3 WEBSITES

1. Google Earth, 2018.

2. The Weather Channel, *San Gabriel, CA Monthly Weather*, https://weather.com/weather/monthly/l/72c00ef93e5739c7c8de446fb391b845057190926d9522da9ba4aa6ada34493a, accessed May 6, 2019.

APPENDIX B
Air Quality/Greenhouse Gas Assessment

Air Quality | Greenhouse Gas Assessment

Arroyo Village Residential Condominium Project

CONSULTANT:

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INTERNATIONAL

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AIR QUALITY/GREENHOUSE GAS ASSESSMENT

for the

Arroyo Village Residential Condominium Project

San Gabriel, California

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July 8, 2019

JN 172409

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TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF TABLES

SYMBOLS, ABBREVIATIONS, AND ACRONYMS

AB	Assembly Bill
APS	alternative planning strategy
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
ATCM	Airborne Toxic Control Measures
Basin	South Coast Air Basin
BAU	business as usual
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention Law
CAL/EPA	California Environmental Protection Agency
CalGreen	California Green Building Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CAT	Climate Action Team
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
City	City of San Gabriel
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
EAP	Energy Action Plan
EECAP	energy efficiency climate action plans
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
General Plan	Comprehensive General Plan of the City of San Gabriel
GHG	greenhouse gas
GWP	Global Warming Potential
H_2O	water vapor
HAPs	Hazardous Air Pollutants
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
HQTAs	High Quality Transit Areas
I-4	Environmental Justice Enhancement Initiative
I-10	San Bernardino Freeway
I-210	Interstate 210
IPCC	International Panel for Climate Change
lbs	pounds
LCFS	Low Carbon Fuel Standard
LOS	Level of Service

LSTs	Localized Significance Thresholds
Metro	Los Angeles County Metropolitan Transportation Authority
MPO	Metropolitan Planning Organization
$MTCO_2eq$	metric tons of carbon dioxide equivalents
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
PFCs	Perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
PST	Pacific Standard Time
RCP	Regional Comprehensive Plan
RH	relative humidity
ROG	Reactive Organic Gasses
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SF_6	Sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control Distrcit
SLCP	Short Lived Climate Pollutants
SO_2	sulfur dioxide
SO_x	sulfur oxides
SP	Service Population
SRA	Source Receptor Area
$\mu g/m^3$	micrograms per cubic meter
UV-B	ultraviolet B rays
VMT	vehicle miles traveled
VOC	Volatile Organic Compound
ZEVs	Zero-emission vehicles

EXECUTIVE SUMMARY

The purpose of this Air Quality/Greenhouse Gas Assessment is to evaluate potential short- and long-term air quality and greenhouse gas (GHG) impacts resulting from implementation of the proposed Arroyo Village Residential Condominium project ("project" or "proposed project"). The proposed project is located at 235 South Arroyo Drive in the City of San Gabriel. Overall, the project site is located within residential area of the City of San Gabriel and is within the City's Mission District Specific Plan area.

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. The underground parking garage would provide 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide seven surface-level parking spaces.

The site's existing driveway along Hampton Court would be abandoned, except for emergency access, and a new vehicular bridge with a pedestrian walkway would be installed over the Alhambra Wash at the southern portion of the project site. The vehicular bridge would provide site access at South Arroyo Drive.

<u>Temporary Impacts</u>. Mitigated construction emissions from project implementation would not exceed established regional or localized South Coast Air Quality Management District (SCAQMD) thresholds.

<u>Long-Term Impacts</u>. The analysis has demonstrated that project implementation would result in less than significant long-term regional and localized air quality impacts. Carbon monoxide hot-spots and air quality health impacts would also be less than significant. The proposed project would result in less than significant impacts for all long-term operational emissions.

<u>Cumulative Impacts</u>. The proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. The project would not result in significant operational emissions of criteria pollutants.

<u>Greenhouse Gas Impacts</u>. The proposed project would result in less than significant GHG impacts. Additionally, the project would not conflict with a plan, policy, or regulation adopted for the purposes of reducing GHG emissions.

1.0 INTRODUCTION

The purpose of this Air Quality and Greenhouse Gas Assessment is to evaluate potential short- and long-term air quality and greenhouse gas (GHG) impacts resulting from implementation of the proposed Arroyo Village Residential Condominium project ("project" or "proposed project") in the City of San Gabriel (City).

1.1 PROJECT LOCATION

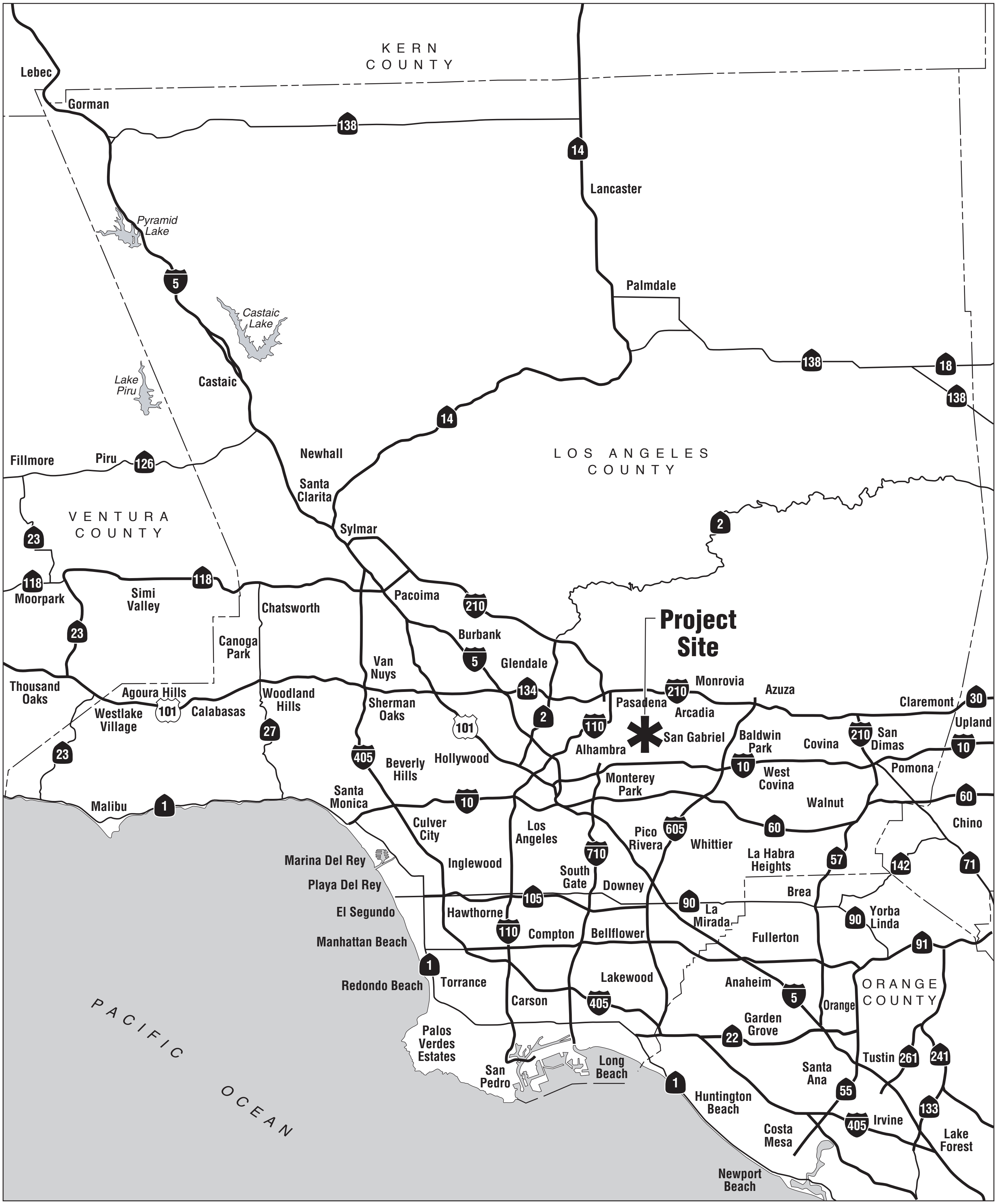
The City is located in the San Gabriel Valley of Los Angeles County, approximately 11 miles east of the Los Angeles Civic Center; refer to Exhibit 1, *Regional Vicinity*. The City consists of 4.09 square miles. Surrounding jurisdictions include the cities of San Marino and Temple City to the north, Temple City, unincorporated County of Los Angeles, and Rosemead to the east, Rosemead to the south, and Alhambra to the west.

The proposed project is approximately 1.12 acres and is located at 235 South Arroyo Drive in the City of San Gabriel (Assessor's Parcel Numbers [APN] 5346-011-001, 5346-011-004, and 5346-011-006); refer to Exhibit 2, *Site Vicinity*. A limited portion of the project site is located in the City of Alhambra at APN 5346-008-031, 5346-009-008, and 5346-009-010. Regional access to the project site is provided via the San Bernardino Freeway (Interstate 10 or I-10) or the Foothill Freeway (Interstate 210 or I-210). Local access to the project site is provided by Arroyo Drive.

1.2 PROJECT DESCRIPTION

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage; refer to Exhibit 3, *Conceptual Site Plan*. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. The underground parking garage would provide 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide seven surface-level parking spaces.

The site's existing driveway along Hampton Court would be abandoned, except for emergency access, and a new vehicular bridge with a pedestrian walkway would be installed over the Alhambra Wash at the southern portion of the project site; refer to Exhibit 4, *Conceptual Bridge Plan*. The vehicular bridge would provide site access at South Arroyo Drive.



AIR QUALITY/GREENHOUSE GAS ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Regional Vicinity

0 5 10 miles
APPROXIMATE

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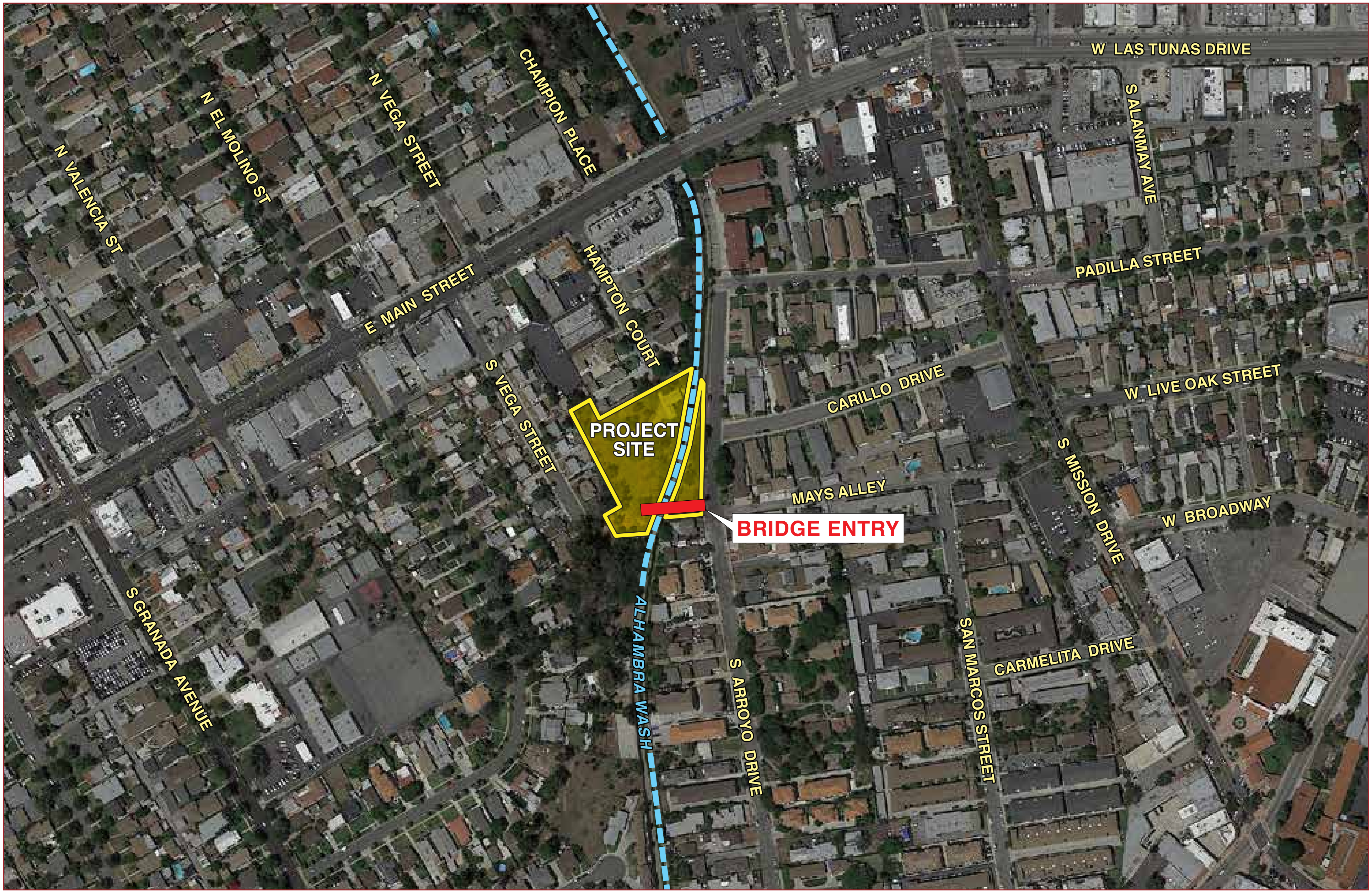
Exhibit 1



Source: Google Earth, April 2019.

Michael Baker INTERNATIONAL

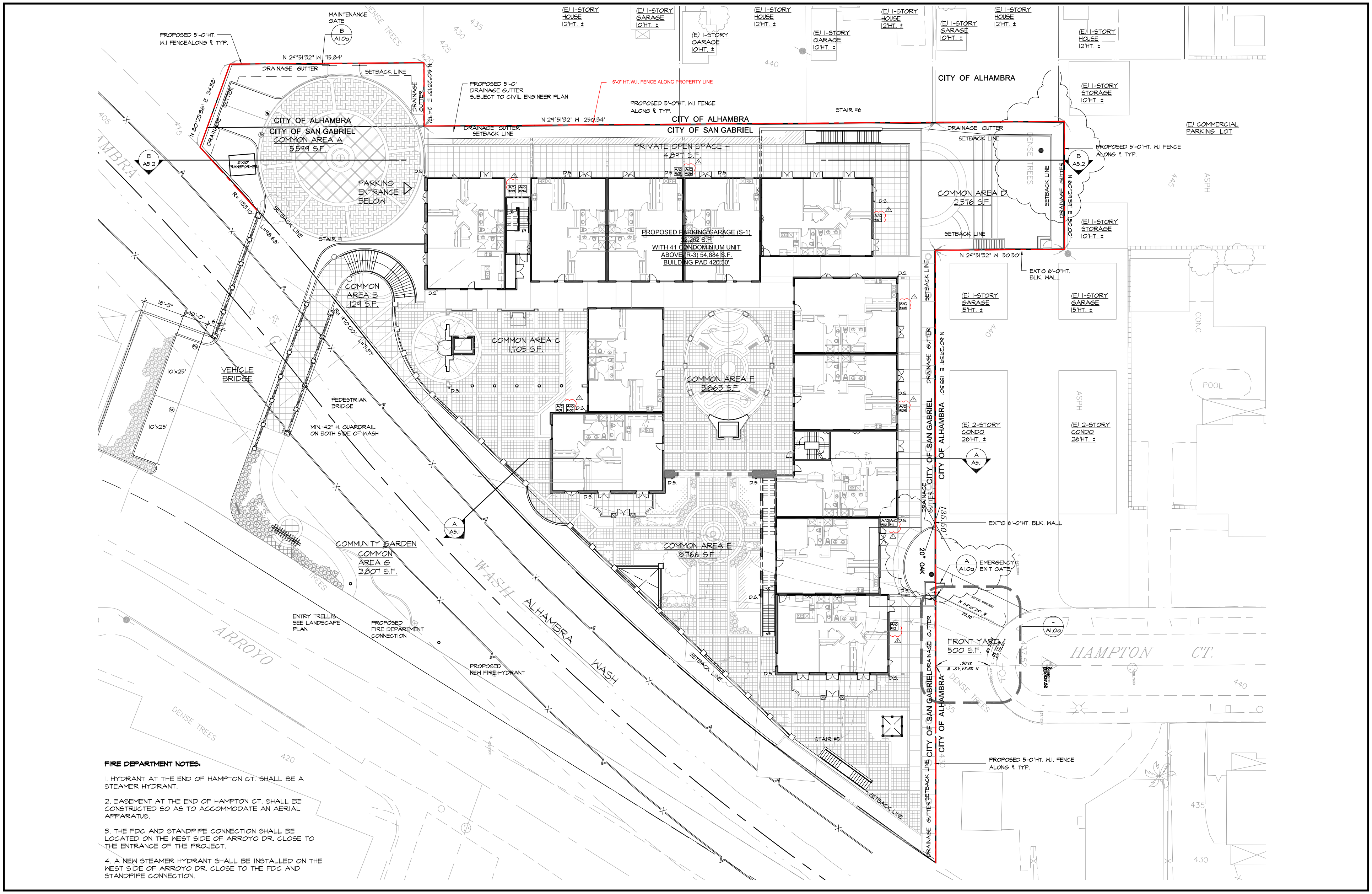
NOT TO SCALE

06/19 | JN 172409

AIR QUALITY/GREENHOUSE GAS ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Site Vicinity

Exhibit 2



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

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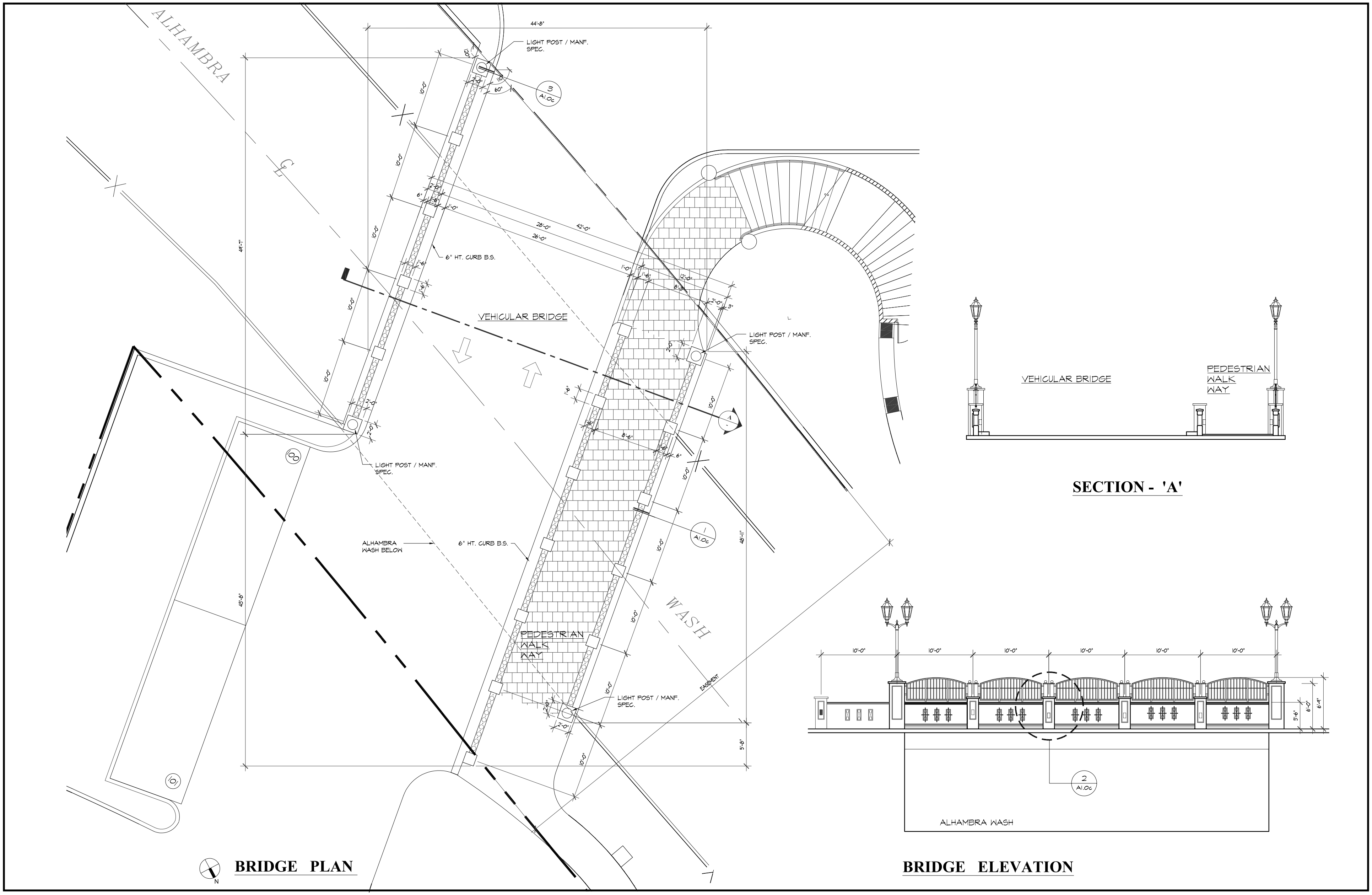
AIR QUALITY/GREENHOUSE GAS ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Site Plan

Exhibit 3



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0b, Bridge Plan, August 13, 2013.

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AIR QUALITY/GREENHOUSE GAS ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Bridge Plan

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Exhibit 4

MISSION DISTRICT SPECIFIC PLAN

The proposed project is within the *Mission District Specific Plan* (Specific Plan) (August 2004) area. The Environmental Impact Report (EIR), dated July 2004, for the Specific Plan determined that impacts related to short-term construction emissions and long-term operational emissions would be less than significant upon implementation of mitigation measures. Additionally, impacts in regard to cumulative air quality impacts and consistency with the Air Quality Management Plan were determined to be less than significant.

2.0 ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The project site lies within the northwestern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

2.1 CLIMATE

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The climate consists of a semiarid environment with mild winters, warm summers, moderate temperatures, and comfortable humidity. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. Precipitation is limited to a few winter storms. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100°F in recent years.

Although the Basin has a semi-arid climate, the air near the surface is moist due to the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation in the Basin is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the day. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the Basin. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the project is located offers clear skies and sunshine, yet is still susceptible to air inversions. These inversions trap a layer of stagnant air near the ground, where it is then further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

The City of San Gabriel experiences average high temperatures of up to 87 degrees (˚) Fahrenheit (F) during the month of August, and average low temperatures of 44 ˚F during the month of December. The City experiences approximately 17.87 inches of precipitation per year, with the most precipitation occurring in the month of February.[1]

[1] US Climate Data, *Monthly Averages for San Gabriel, CA*, http://www.usclimatedata.com/climate/san-gabriel/california/united-states/usca0988, accessed on May 14, 2019.

3.0 STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

3.1 AMBIENT AIR QUALITY STANDARDS

CARB and the U.S. Environmental Protection Agency (EPA) establish ambient air quality standards for major pollutants at thresholds intended to protect public health. The standards for some pollutants are based on other values such as protection of crops or avoidance of nuisance conditions. Table 1, *State and National Ambient Air Quality Standards and Attainment Status*, summarizes the State California Ambient Air Quality Standards (CAAQS) and the Federal National Ambient Air Quality Standards (NAAQS).

CARB designates all areas within the State as either attainment (having air quality better than the CAAQS) or nonattainment (having a pollution concentration that exceeds the CAAQS more than once in three years). Likewise, the EPA designates all areas of the U.S. as either being in attainment of the NAAQS or nonattainment if pollution concentrations exceed the NAAQS. Because attainment/nonattainment is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the State and national standards differ, an area could be classified as attainment for the Federal standard of a pollutant while it may be nonattainment for the State standard of the same pollutant. Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. The attainment status of SCAQMD for CAAQS and NAAQS for the area where the proposed project is located is shown in Table 1 and is discussed in more detail below under "Ambient Air Monitoring."

3.2 AMBIENT AIR MONITORING

CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations ten feet aboveground level; therefore, air quality is often referred to in terms of ground-level concentrations. The project site is located within Source Receptor Area (SRA) 8, West San Gabriel Valley. The closest air monitoring station to the project site is the Pasadena Monitoring Station. Local air quality data from 2015 to 2017 is provided in Table 2, *Summary of Air Quality Data*. This table lists the monitored maximum concentrations and number of exceedances of Federal/State air quality standards for each year.

Table 1
State and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California[1]		Federal[2]	
		Standard[3]	Attainment Status	Standards[3,4]	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	**Nonattainment**	N/A	N/A[5]
	8 Hours	0.070 ppm (137 $\mu g/m^3$)	**Nonattainment**	0.070 ppm (137 $\mu g/m^3$)	**Nonattainment**
Particulate Matter (PM_{10})	24 Hours	50 $\mu g/m^3$	**Nonattainment**	150 $\mu g/m^3$	Attainment/Maintenance
	Annual Arithmetic Mean	20 $\mu g/m^3$	**Nonattainment**	N/A	N/A
Fine Particulate Matter ($PM_{2.5}$)	24 Hours	No Separate State Standard		35 $\mu g/m^3$	**Nonattainment**
	Annual Arithmetic Mean	12 $\mu g/m^3$	**Nonattainment**	12.0 $\mu g/m^3$	**Nonattainment**
Carbon Monoxide (CO)	8 Hours	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment/Maintenance
	1 Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment/Maintenance
Nitrogen Dioxide (NO_2)[5]	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)	N/A	53 ppb (100 $\mu g/m^3$)	Attainment/Maintenance
	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Attainment	100 ppb (188 $\mu g/m^3$)	Attainment/Maintenance
Lead (Pb)[7,8]	30 days Average	1.5 $\mu g/m^3$	Attainment	N/A	N/A
	Calendar Quarter	N/A	N/A	1.5 $\mu g/m^3$	**Nonattainment**
	Rolling 3-Month Average	N/A	N/A	0.15 $\mu g/m^3$	**Nonattainment**
Sulfur Dioxide (SO_2)[6]	24 Hours	0.04 ppm (105 $\mu g/m^3$)	Attainment	0.14 ppm (for certain areas)	Unclassified/Attainment
	3 Hours	N/A	N/A	N/A	N/A
	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Attainment	75 ppb (196 $\mu g/m^3$)	N/A
	Annual Arithmetic Mean	N/A	N/A	0.30 ppm (for certain areas)	Unclassified/Attainment
Visibility-Reducing Particles[9]	8 Hours (10 a.m. to 6 p.m., PST)	Extinction coefficient = 0.23 km@<70% RH	Unclassified	**No Federal Standards**	
Sulfates	24 Hour	25 $\mu g/m^3$	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Unclassified		
Vinyl Chloride[7]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	N/A		

$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million; ppb = parts per billion; km = kilometer(s); RH = relative humidity; PST = Pacific Standard Time; N/A = Not Applicable

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
6. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
7. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
8. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
9. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: California Air Resources Board and U.S. Environmental Protection Agency, *Ambient Air Quality Standards chart,* http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, May 4, 2016.

Table 2
Summary of Air Quality Data

Pollutant	California Standard	Federal Primary Standard	Year	Maximum Concentration[3]	Days (Samples) State/Federal Std. Exceeded
Ozone (O_3)[1] (1-hour)	0.09 ppm for 1 hour	NA[6]	2015 2016 2017	0.111 ppm 0.126 0.139	5/0 8/0 2/0
Ozone (O_3)[1] (8-hour)	0.070 ppm for 8 hours	0.070 ppm for 8 hours	2015 2016 2017	0.084 ppm 0.090 0.100	18/18 19/18 38/36
Carbon Monoxide (CO)[1] (1-hour)	20 ppm for 1 hour	35 ppm for 1 hour	2015 2016 2017	2.57 ppm 1.54 2.24	0/0 0/0 0/0
Nitrogen Dioxide (NO_2)[1]	0.18 ppm for 1 hour	0.100 ppm for 1 hour	2015 2016 2017	74.9 ppm 71.9 72.3	0/0 0/0 0/0
Fine Particulate Matter ($PM_{2.5}$)[1, 5]	No Separate Standard	35 μg/m^3 for 24 hours	2015 2016 2017	48.5 μg/m^3 29.2 22.8	6/6 0/0 0/0
Particulate Matter (PM_{10})[2, 4, 5]	50 μg/m^3 for 24 hours	150 μg/m^3 for 24 hours	2015 2016 2017	88.5 μg/m^3 74.6 96.2	14/0 NA/0 NA/0

ppm = parts per million; PM_{10} = particulate matter 10 microns in diameter or less; NM = not measured; μg/m^3 = micrograms per cubic meter; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; NA = not applicable.

Notes:

1. Data collected from the Pasadena Monitoring Station located at 752 South Wilson Avenue, Pasadena, California 91106.
2. Data collected from the Los Angeles-North Main Street Monitoring Station located at 1630 North Main Street, Los Angeles, California 90012.
3. Maximum concentration is measured over the same period as the California Standards.
4. PM_{10} exceedances are based on State thresholds established prior to amendments adopted on June 20, 2002.
5. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.
6. The Federal standard was revoked in June 2005.

Sources:
California Air Resources Board, *ADAM Air Quality Data Statistics*, http://www.arb.ca.gov/adam/, accessed May 14, ,2019.
California Air Resources Board, *AQMIS2: Air Quality Data*, https://www.arb.ca.gov/aqmis2/aqdselect.php, accessed May 14, 2019.

Ozone. Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. The troposphere extends approximately 10 miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the "good" ozone) layer extends upward from about ten to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B). "Bad" ozone is a photochemical pollutant, and needs volatile organic compounds (VOCs), Nitrogen Oxides (NO_X) and sunlight to form; therefore, VOCs and NO_X are ozone precursors. VOCs and NO_X are emitted from various sources throughout the City. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight.

Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some man-made materials (such as rubber, paint, and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment and reduced crop yields.

Carbon Monoxide. Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, and unconsciousness.

Nitrogen Dioxide. Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level O_3, and react in the atmosphere to form acid rain. NO_2 (often used interchangeably with NO_X) is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_2 can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_2 concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

Coarse Particulate Matter (PM_{10}). PM_{10} refers to suspended particulate matter, which is smaller than ten microns or ten one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate the lungs and can potentially damage the respiratory tract. On June 19, 2003, CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (SB 25).

Fine Particulate Matter ($PM_{2.5}$). Due to recent increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with pre-existing cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the EPA, the U.S. Supreme Court reversed this decision and upheld the EPA's new standards.

On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.

Reactive Organic Gases and Volatile Organic Compounds. Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including reactive organic gases (ROGs) and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

3.3 GLOBAL CLIMATE CHANGE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[2] The greenhouse effect traps heat in the troposphere through a three-fold process as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHG in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO_2). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs normally associated with the project include the following:[3]

Water Vapor (H_2O). Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively. The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, it does not contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

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[2] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[3] All GWPs are given as 100-year GWP. Unless noted otherwise, all GWPs were obtained from the Intergovernmental Panel on Climate Change.

Carbon Dioxide (CO_2). Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, CO_2 emissions from fossil fuel combustion increased by a total of 1.3 percent between 1990 and 2017.[4] Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

Methane (CH_4). Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. The United States' top three methane sources are landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, used for space and water heating, steam production, and power generation. The GWP of methane is 25.

Nitrous Oxide (N_2O). Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 298.

Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is increasing, as the continued phase out of Chlorofluorocarbons (CFCs) and HCFCs gains momentum. The 100-year GWP of HFCs range from 124 for HFC-152 to 14,800 for HFC-23.[5]

Perfluorocarbons (PFCs). PFCs are compounds consisting of carbon and fluorine, and are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of CO_2, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[6] The GWP of PFCs range from 7,390 to 12,200.[7]

Sulfur hexafluoride (SF_6). SF_6 is a colorless, odorless, nontoxic, nonflammable gas. SF_6 is the most potent GHG that has been evaluated by the IPCC with a GWP of 22,800.[8] However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to CO_2 (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[9]

4 United States Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2016*7 April 2018, https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf, accessed May 21, 2019.

5 Ibid.

6 United States Environmental Protection Agency, *Overview of Greenhouse Gas Emissions*, https://www.epa.gov/ghgemissions/overview-greenhouse-gases, accessed May 21, 2019.

7 Ibid.

8 Ibid.

9 Ibid.

3.4 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Table 3, *Sensitive Receptors*, lists the distances and locations of sensitive receptors within the project vicinity. The distances depicted in Table 3 are based on the distance from the project site to the outdoor activity area of the closest receptor.

Table 3
Sensitive Receptors

Type	Name	Distance from Project Site (feet)	Direction from Project Site	Location
Residential	Residential Uses	Adjoining	North	Along Arroyo Drive and Hampton Court
		Adjoining	East	Along Arroyo Drive and Carillo Drive
		Adjoining	South	Along Arroyo Drive
		Adjoining	West	Along Vega Street
Schools	Paramount Academy	680	Northwest	1027 East Main Street, Alhambra, CA 91801
	Growing Time Montessori School	934	East	248 South Mission Drive, San Gabriel, CA 91776
	Granada Elementary School	770	Southwest	100 South Granada Avenue, Alhambra, CA 91801
	San Gabriel Mission High School	1,664	East	254 South Santa Anita Street, San Gabriel, CA 91776
	San Gabriel High School	1,945	South	801 South Ramona Street, San Gabriel, CA 91776
	Children's Montessori Center	1,985	Southwest	19 North Hidalgo Avenue, Alhambra, CA 91801
	St. Therese School Alhambra	2,417	Northwest	1106 East Alhambra Road, Alhambra, CA 91801
	Washington Elementary School	3,490	Northeast	300 North San Marino Avenue, San Gabriel, CA 91775
	Emmaus Lutheran School	4,506	South	840 South Almansor Street, Alhambra, CA 91801
	Martha Baldwin Elementary School	4,905	South	900 South Almansor Street, Alhambra, CA 91801
	Alhambra High School	5,033	Southwest	101 South 2nd Street, Alhambra, CA 91801
Library	Jack Miller Memorial Library	4,313	Southwest	20 West Commonwealth Avenue, Alhambra, CA 91801
	Alhambra Civic Center Library	4,641	Southwest	101 South 1st Street, Alhambra, CA 91801
Places of Worship	Church in San Gabriel	1,318	Southeast	615 West Santa Anita Street, San Gabriel, CA 91776
	San Gabriel Mission	1,579	Southeast	428 South Mission Drive, San Gabriel, CA 91776
	Alhambra First United Methodist	2,306	West	9 North Almansor Street, Alhambra, CA 91801
	Sacred Heart Retreat	2,400	Northwest	507 North Granada Avenue, Alhambra, CA 91801
	St. Therese Church	2,533	Northwest	1100 East Alhambra Road, Alhambra, CA 91801
	Alhambra Seventh Day Adventist	2,771	Southwest	220 South Chapel Avenue, Alhambra, CA 91801
	San Gabriel Presbyterian Church	3,308	East	200 West Las Tunas Drive, San Gabriel, CA 91776
	Church of Our Saviour	3,721	Northeast	535 West Roses Road, San Gabriel, Ca 91775
	Carmel of St Teresa	4,100	Northwest	215 East Alhambra Road, Alhambra, CA 91801
Parks	Plaza Park	1,802	Southeast	Along Mission Road
	Lindaraka Park	1,953	Northwest	North Cordova Street, Alhambra, CA
	Alhambra Golf Course	2,113	South	630 South Almansor Street, Alhambra, CA 91801
	Smith Park	2,635	East	232 West Broadway, San Gabriel, CA 91776
	Story Park	3,058	West	210 North Chapel Avenue, Alhambra, CA 91801
	Almansor Park	3,687	Southwest	800 South Almansor Street, Alhambra, CA 91801
	San Gabriel Country Club	5,100	Northeast	350 East Hermosa Drive, San Gabriel, CA 91775

Note:
1 – Distances are measured from the exterior project boundary only and not from individual construction areas within the interior of the project site.
Source: Google Earth, 2019.

4.0 REGULATORY SETTING

4.1 AIR QUALITY REGULATORY PROGRAMS

4.1.1 FEDERAL

Clean Air Act. The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the EPA to establish NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants. In 2007, the Supreme Court found that carbon dioxide is an air pollutant covered by the CAA; however, no NAAQS have been established for carbon dioxide.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The EPA 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. Table 1 lists the federal attainment status of the Basin for the criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants Program. Under federal law, 188 substances are listed as hazardous air pollutants (HAPs). Major sources of specific HAPs are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) program. The EPA is establishing regulatory schemes for specific source categories and requires implementation of MACTs for major sources of HAPs in each source category. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and is aimed at HAPs that are a problem in California. The state has formally identified 244 substances as TACs and is adopting appropriate control measures for each. Once adopted at the state level, each air district will be required to adopt a measure that is equally or more stringent.

4.1.2 STATE

California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588). The California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) is a state-wide program enacted in 1987. AB 2588 requires facilities that exceed recommended Office of Environmental Health Hazard Assessment (OEHHA) levels to reduce risks to acceptable levels.

Typically, land development projects generate diesel emissions from construction vehicles during the construction phase, as well as some diesel emissions from small trucks during the operational phase. Diesel exhaust is mainly composed of particulate matter and gases, which contain potential cancer-causing substances. Emissions from diesel engines currently include over 40 substances that are listed by EPA as hazardous air pollutants and by CARB as toxic air contaminants. In 1998, CARB identified particulate matter in diesel exhaust as a TAC, based on data linking diesel particulate emissions to increased risks of lung cancer and respiratory disease.

In 2000, CARB adopted a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020. As part of this plan, CARB identified Airborne Toxic Control Measures (ATCM) for mobile and stationary emissions sources. Each ATCM is codified in the California Code of Regulations, including the ATCM to limit diesel-fueled commercial motor vehicle idling, which puts limits on idling time for large diesel engines (13 CCR Chapter 10 Section 2485).

<u>California Clean Air Act</u>. The California Clean Air Act (CCAA) 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 Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California ambient air quality standards. 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 State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

In addition to standards set for the six criteria pollutants, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Further, in addition to primary and secondary ambient air quality standards, the State has established a set of episode criteria for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health. <u>Table 1</u> above lists the state attainment status of the Basin for the criteria pollutants.

<u>California State Implementation Plan</u>. The federal CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP is a living document that 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 CAA Amendments dictate that states containing areas violating the national ambient air quality standards 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 EPA has the responsibility to review all State Implementation Plans to determine if they conform to the requirements of the CAA.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the EPA for approval and publication in the Federal Register.

Senate Bill 1889, Accidental Release Prevention Law/California Accidental Release Prevention Program. Senate Bill (SB) 1889 required California to implement a new federally mandated program governing the accidental airborne release of chemicals promulgated under Section 112 of the CAA. In 1997, the California Accidental Release Prevention Law (CalARP) replaced the previous California Risk Management and Prevention Program and incorporated the mandatory federal requirements. CalARP addresses facilities that contain specified hazardous materials, known as regulated substances, which if involved in an accidental release, could result in adverse offsite consequences. CalARP defines regulated substances as chemicals that pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive.

4.1.3 REGIONAL

South Coast Air Quality Management District. The SCAQMD is one of 35 air quality management districts that have prepared AQMP's to accomplish a five-percent annual reduction in emissions. The *2016 Air Quality Management Plan* (2016 AQMP) is a regional blueprint for achieving air quality standards and healthful air. The 2016 AQMP represents a new approach, focusing on available, proven, and cost-effective alternatives to traditional strategies, while seeking to achieve multiple goals in partnership with other entities promoting reductions in greenhouse gases and toxic risk, as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP incorporates the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, Regional Transportation Plan/Sustainable Communities Strategy, and updated emission inventory methodologies for various source categories. The 2016 AQMP relies on a multi-level partnership of governmental agencies at the federal, State, regional, and local level. These agencies (EPA, CARB, local governments, Southern California Association of Governments [SCAG] and the SCAQMD) are the primary agencies that implement the AQMP programs.

Southern California Association of Governments. The Southern California Association of Governments (SCAG) adopted the *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy* (2016–2040 RTP/SCS) on April 7, 2016. The 2016–2040 RTP/SCS reaffirms the land use policies that were incorporated into the 2012–2035 RTP/SCS. These foundational policies, which guided the development of the 2016–2040 RTP/SCS's strategies for land use, include the following:

- Identify regional strategic areas for infill and investment;
- Structure the plan on a three-tiered system of centers development;[10]
- Develop "Complete Communities";
- Develop nodes on a corridor;
- Plan for additional housing and jobs near transit;
- Plan for changing demand in types of housing;
- Continue to protect stable, existing single-family areas;
- Ensure adequate access to open space and preservation of habitat; and
- Incorporate local input and feedback on future growth.

The 2016–2040 RTP/SCS recognizes that transportation investments and future land use patterns are inextricably linked, and continued recognition of this close relationship will help the region make choices that sustain existing resources and expand efficiency, mobility, and accessibility for people across the region. In particular, the 2016–2040 RTP/SCS draws a closer connection between where people live and work, and it offers a blueprint for how Southern California can grow more sustainably. The 2016–2040 RTP/SCS also includes strategies focused on compact infill development and economic growth by building the infrastructure the region needs to promote the smooth flow of goods and easier access to jobs, services, educational facilities, healthcare and more.

The 2016–2040 RTP/SCS states that the SCAG region is home to about 18.3 million people in 2012 and currently includes approximately 5.9 million homes and 7.4 million jobs.[11] By 2040, the integrated growth forecast projects that these figures will increase by 3.8 million people, with nearly 1.5 million more homes and 2.4 million more jobs. High Quality Transit Areas[12] (HQTAs) will account for 3 percent of regional total land but are projected to accommodate 46 percent and 55 percent of future household and employment growth respectively between 2012 and 2040. The 2016–2040 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in the region's HQTAs. HQTAs are a cornerstone of land use planning best practice in the SCAG region because they concentrate roadway repair investments, leverage transit and active transportation investments, reduce regional life cycle

[10] Complete language: "Identify strategic centers based on a three-tiered system of existing, planned and potential relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment." A more detailed description of these strategies and policies can be found on pp. 90–92 of the SCAG 2008 Regional Transportation Plan, adopted in May 2008.

[11] 2016-2040 RTP/SCS population growth forecast methodology includes data for years 2012, 2020, 2035 and 2040.

[12] Defined by the 2016–2040 RTP/SCS as generally walkable transit villages or corridors that are within 0.5 mile of a well-serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours.

infrastructure costs, improve accessibility, create local jobs, and have the potential to improve public health and housing affordability.

The 2016–2040 RTP/SCS is expected to reduce per capita transportation emissions by 8 percent by 2020 and 18 percent by 2035. This level of reduction would meet the region's GHG targets set by CARB of 8 percent per capita by 2020 and exceed the region's GHG target set by CARB of 13 percent per capita by 2035.[13] Furthermore, although there are no per capita GHG emission reduction targets for passenger vehicles set by CARB for 2040, the 2016–2040 RTP/SCS's GHG emission reduction trajectory shows that more aggressive GHG emission reductions are projected for 2040.[14] The 2016–2040 RTP/SCS would result in an estimated 21 percent decrease in per capita GHG emissions by 2040. By meeting and exceeding the SB 375 targets for 2020 and 2035, as well as achieving an approximately 21-percent decrease in per capita GHG emissions by 2040 (an additional 3-percent reduction in the five years between 2035 [18 percent] and 2040 [21 percent]), the 2016–2040 RTP/SCS is expected to fulfill and exceed its portion of SB 375 compliance with respect to meeting the state's GHG emission reduction goals.

4.2 GLOBAL CLIMATE CHANGE REGULATORY PROGRAMS

4.2.1 FEDERAL

To date, no national standards have been established for the nationwide GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. Various efforts have been promulgated at the Federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, requires the following, which would aid in the reduction of national GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.

- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.

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[13] Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, Executive Summary, p. 8, April 2016.

[14] Southern California Association of Governments, *Final Program Environmental Impact Report for 2016–2040, RTP/SCS*, Figure 3.8.4-1, April 2016.

- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

U.S. Environmental Protection Agency Endangerment Finding. The EPA authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act (CAA) and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, the EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs (carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing CAA and the EPA's assessment of the scientific evidence that form the basis for the EPA's regulatory actions.

4.2.2 STATE

Various Statewide and local initiatives to reduce the State's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is under way, and there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation is necessary to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-3-05. Executive Order S-3-05 set forth a series of target dates by which Statewide emissions of GHGs would be progressively reduced, as follows:

By 2010, reduce GHG emissions to 2000 levels;
By 2020, reduce GHG emissions to 1990 levels; and
By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary also submits biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on Statewide GHG emissions. AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that prescribe land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets are updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets.

Senate Bill 32 (SB 32). Signed into law on September 2016, SB 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes CARB to adopt an interim GHG emissions level target to be achieved by 2030. CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions.

CARB Scoping Plan. On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve the California GHG reductions required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California would implement to reduce the projected 2020 "Business as Usual" (BAU) emissions to 1990 levels, as required by AB 32. These strategies are intended to reduce CO_2eq[15] emissions by 174 million metric tons (MT). This reduction of 42 million MT CO_2eq, or almost ten percent from 2002 to 2004 average emissions, would be required despite the population and economic growth forecasted through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as those expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting

[15] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. When CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.
AB 32 requires CARB to update the Scoping Plan at least once every five years. CARB adopted the first major update to the Scoping Plan on May 22, 2014. The updated Scoping Plan summarizes recent science related to climate change, including anticipated impacts to California and the levels of GHG reduction necessary to likely avoid risking irreparable damage. It identifies the actions California has already taken to reduce GHG emissions and focuses on areas where further reductions could be achieved to help meet the 2020 target established by AB 32. The Scoping Plan update also looks beyond 2020 toward the 2050 goal, established in Executive Order S-3-05, and observes that "a mid-term statewide emission limit will ensure that the State stays on course to meet our long-term goal." The Scoping Plan update did not establish or propose any specific post-2020 goals, but identified such goals in water, waste, natural resources, clean energy, transportation, and land use.

On January 20, 2017, CARB released the proposed Second Update to the Scoping Plan, which identifies the State's post-2020 reduction strategy. The Second Update was approved on December 14, 2017 and reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32.[16] The 2017 Scoping Plan establishes a new emissions limit of 260 million $MTCO_2eq$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030. The 2017 Scoping Plan Update contains the following goals:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
   - Doubling of energy efficiency savings by 2030.

2. Low Carbon Fuel Standard (LCFS)
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).

3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.

4. Sustainable Freight Action Plan
   - Improve freight system efficiency.

16 California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf, accessed May 21, 2019.

   - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.

5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
   - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
   - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.

6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.

7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - CARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements.

8. 20 percent reduction in GHG emissions from the refinery sector.

9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

4.2.3 LOCAL

4.2.3.1 City of San Gabriel

General Plan. The *Comprehensive General Plan of the City of San Gabriel, California* (General Plan) Environmental Resources chapter discusses how the City plans on reducing poor air quality within its jurisdiction. The following lists applicable air quality goals and targets obtained from the General Plan*:*

Enhanced Air Quality

Goal 8.6: *Improve air quality within the City of San Gabriel.*

Target 8.6.1: *Reduce the amount of emissions from vehicles in San Gabriel.*

Target 8.6.2: *Encourage the use of mass transit, carpooling, bicycling, and other alternative transportation options.*

Target 8.6.5: *Encourage the planting of street trees and yard trees because of their air quality contribution.*

Target 8.6.16: Require new construction in Transit Oriented Design areas to be designed to incorporate the ideas of transit oriented design.

Energy Action Plan. The City has adopted an *Energy Action Plan* (EAP) (November 20, 2012), as part of a regional partnership between the City, Southern California Edison (SCE), and the San Gabriel Valley Council of Governments (SGVCOG). Past and current collaborative efforts between these partners have focused on improving energy efficiency by providing local governments with funding, technical support, and a forum for sharing information through the San Gabriel Valley Energy Wise Partnership (SGVEWP). This EAP meets the requirements of the Energy Leader Partnership Model and is part of a larger regional effort to develop GHG emissions inventories and energy efficiency climate action plans (EECAP) for 27 participating cities in the SGVCOG. The purpose of this EAP is to identify the City of San Gabriel's long-term vision and commitment to achieve energy efficiency in the City. The EAP notes that it could serve as the foundation for future climate action planning projects.

Sustainability Action Plan. On October 20, 2009, the San Gabriel City Council adopted the *San Gabriel Goes Green 2009 Sustainability Action Plan* (2009 Sustainability Action Plan). The 2009 Sustainability Action Plan identifies ways for the City to improve their sustainable practices. The 2009 Sustainability Action Plan also includes several categories the City will focus on to achieve their sustainability goals, including water conservation, building efficiency, energy conservation, green practices, resource conservation, and waste reduction. However, the 2009 Sustainability Action Plan does not include an emissions inventory or a method of quantifying the identified sustainable strategies.

5.0 POTENTIAL AIR QUALITY AND GREENHOUSE GAS IMPACTS

CEQA THRESHOLDS

Appendix G of the *CEQA Guidelines* contains the Environmental Checklist form that was used during the preparation of this Technical Study. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement AQ-1);
- 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 (refer to Impact Statement AQ-2);
- Expose sensitive receptors to substantial pollutant concentrations (refer to Impact Statement AQ-3);
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (refer to Impact Statement AQ-4);
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (refer to Impact Statement GHG-1); and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases (refer to Impact Statement GHG-2).

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts.

AIR QUALITY THRESHOLDS

Under CEQA, the SCAQMD is an expert commenting agency on air quality within its jurisdiction or impacting its jurisdiction. Under the Federal Clean Air Act (FCAA), the SCAQMD has adopted Federal attainment plans for O_3 and PM_{10}. The SCAQMD reviews projects to ensure that they would not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any Federal attainment plan.

The *CEQA Air Quality Handbook* also provides significance thresholds for both construction and operation of projects within the SCAQMD jurisdictional boundaries. If the SCAQMD thresholds are exceeded, a potentially significant impact could result. However, ultimately the lead agency determines the thresholds of significance for impacts. If a project proposes development in excess of the established thresholds, as outlined in Table 4, *South Coast Air Quality Management District Emissions Thresholds*, a significant air quality impact may occur and additional analysis is warranted to fully assess the significance of impacts.

Table 4
South Coast Air Quality Management District Emissions Thresholds

Phase	Pollutant (lbs/day)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction	75	100	550	150	150	55
Operational	55	55	550	150	150	55
Source: South Coast Air Quality Management District, CEQA Air Quality Handbook, November 1993.						

Local Carbon Monoxide Standards

A project would result in a local air quality impact if the project results in increased traffic volumes and/or decreases in Level of Service (LOS) that would result in an exceedance of the CO ambient air quality standards of 20 parts per million (ppm) for 1-hour CO concentration levels, and 9 ppm for 8-hour CO concentration levels. If the CO concentrations at potentially impacted intersections with the project are lower than the standards, then there is no significant impact. If future CO concentrations with the project are above the standard, then the project would have a significant local air quality impact.

Localized Significance Thresholds

Localized Significance Thresholds (LSTs) were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated July 2008) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific level proposed projects. The SCAQMD provides the LST lookup tables for one-, two-, and five-acre projects emitting CO, NO_X, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors.

Cumulative Emissions Thresholds

The SCAQMD's 2016 AQMP was prepared to accommodate growth, meet State and Federal air quality standards, and minimize the fiscal impact that pollution control measures have on the local economy. According to the *CEQA Air Quality Handbook*, project-related emissions that fall below the established construction and operational thresholds are considered less than significant.

SCAQMD rule development through the 1970s and 1980s resulted in dramatic improvement in Basin air quality. Nearly all control programs developed through the early 1990s relied on (i) the development and application of cleaner technology; (ii) add-on emission controls; and (iii) uniform CEQA review throughout the Basin. Industrial emission sources have been significantly reduced by this approach and vehicular emissions have been reduced by technologies implemented at the state level by CARB.

As discussed above, the SCAQMD is the lead agency charged with regulating air quality emission reductions for the entire Basin. SCAQMD created AQMPs, which represent a regional blueprint for achieving healthful air on behalf of the 16 million residents of the South Coast Basin. The historical improvement in air quality since the 1970s is the direct result of southern California's comprehensive, multiyear strategy of reducing air pollution from all sources as outlined in its AQMPs and by utilizing uniform CEQA review throughout the Basin.

Ozone, NO_x, VOC, and CO have been decreasing in the Basin since 1975 and are projected to continue to decrease through 2020. These decreases result primarily from motor vehicle controls and reductions in evaporative emissions. Although vehicle miles traveled in the Basin continue to increase, NO_x and VOC levels are decreasing because of the mandated controls on motor vehicles and the replacement of older polluting vehicles with lower-emitting vehicles. NO_x emissions from electric utilities have also decreased due to use of cleaner fuels and renewable energy. The overall trends of PM_{10} and $PM_{2.5}$ in the air (not emissions) show an overall improvement since 1975. Direct emissions of PM_{10} have remained somewhat constant in the Basin and direct emissions of $PM_{2.5}$ have decreased slightly since 1975. Area wide sources (fugitive dust from roads, dust from construction and demolition, and other sources) contribute the greatest amount of direct particulate matter emissions.

Part of the control process of the SCAQMD's duty to greatly improve the air quality in the Basin is the uniform CEQA review procedures required by SCAQMD's *CEQA Handbook*. The single threshold of significance used to assess direct and cumulative project impacts has in fact "worked" as evidenced by the track record of the air quality in the Basin dramatically improving over the course of the past decades. As stated by the SCAQMD, the SCAQMD thresholds of significance are based on factual and scientific data and are therefore appropriate thresholds of significance to use for this project.

Greenhouse Gas Emissions Thresholds

At this time, there is no absolute consensus in the State of California among CEQA lead agencies regarding the analysis of global climate change and the selection of significance criteria. In fact, numerous organizations, both public and private, have released advisories and guidance with recommendations designed to assist decision-makers in the evaluation of GHG emissions given the current uncertainty regarding when emissions reach the point of significance.

Lead agencies may elect to rely on thresholds of significance recommended or adopted by State or regional agencies with expertise in the field of global climate change (*CEQA Guidelines* Section 15064.7[c]). CEQA leaves the determination of significance to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. However, the City has not yet established specific quantitative significance thresholds for GHG emissions for development projects.

The SCAQMD has formed a GHG CEQA Significance Threshold Working Group (Working Group) to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. As of the last Working Group meeting (Meeting No. 15) held in September 2010, the SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency.[17]

With the tiered approach, the project is compared with the requirements of each tier sequentially and would not result in a significant impact if it complies with any tier. Tier 1 excludes projects that are specifically exempt from SB 97 from resulting in a significant impact. Tier 2 excludes projects that are consistent with a GHG reduction plan that has a certified final CEQA document and complies with AB 32 GHG reduction goals. Tier 3 excludes projects with annual emissions lower than a screening threshold. For all non-industrial projects, the SCAQMD is proposing a screening threshold of 3,000 $MTCO_2eq$ per year. SCAQMD concluded that projects with emissions less than the screening threshold would not result in a significant cumulative impact.

Tier 4 consists of three decision tree options. Under the Tier 4 first option, the project would be excluded if design features and/or mitigation measures resulted in emissions 30 percent lower than business as usual emissions. Under the Tier 4 second option the project would be excluded if it had early compliance with AB 32 through early implementation of CARB's Scoping Plan measures. Under the Tier 4 third option, the project would be excluded if it was below an efficiency-based threshold of 4.8 $MTCO_2eq$ per service population (SP) per year.[18] Tier 5 would exclude projects that implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level.

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[17] The most recent SCAQMD GHG CEQA Significance Threshold Working Group meeting was held on September 2010.

[18] The project-level efficiency-based threshold of 4.8 $MTCO_2eq$ per SP per year is relative to the 2020 target date. The SCAQMD has also proposed efficiency-based thresholds relative to the 2035 target date to be consistent with the GHG reduction target date of SB 375. GHG reductions by the SB 375 target date of 2035 would be approximately 40 percent. Applying this 40 percent reduction to the 2020 targets results in an efficiency threshold for plans of 4.1 $MTCO_2eq$ per SP per year and an efficiency threshold at the project level of 3.0 $MTCO_2eq$/year.

GHG efficiency metrics are utilized as thresholds to assess the GHG efficiency of a project on a per capita basis or on a "service population" basis (the sum of the number of jobs and the number of residents provided by a project) such that the project would allow for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020 and 2035). GHG efficiency thresholds can be determined by dividing the GHG emissions inventory goal of the State, by the estimated 2035 population and employment. This method allows highly efficient projects with higher mass emissions to meet the overall reduction goals of AB 32, and is appropriate, because the threshold can be applied evenly to all project types (residential or commercial/retail only and mixed-use).

GHG efficiency metrics are utilized as thresholds to assess the GHG efficiency of a project on a per capita basis or on a "service population" basis (the sum of the number of jobs and the number of residents provided by a project) such that a project would allow for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020 and 2035). GHG efficiency thresholds can be determined by dividing the GHG emissions inventory goal of the State, by the estimated 2035 population and employment. This method allows highly efficient projects with higher mass emissions to meet the overall reduction goals of AB 32, and is appropriate, because the threshold can be applied evenly to all project types (residential or commercial/retail only and mixed-use).

The project-level efficiency-based threshold of 4.8 $MTCO_2eq$ per SP per year is relative to the 2020 target date. The SCAQMD has also proposed efficiency-based thresholds relative to the 2035 target date to be consistent with the GHG reduction target date of SB 375. GHG reductions by the SB 375 target date of 2035 would be approximately 40 percent. Applying this 40 percent reduction to the 2020 targets results in an efficiency threshold for plans of 4.1 $MTCO_2eq$ per SP per year and an efficiency threshold at the project level of 3.0 $MTCO_2eq$/year per SP.

As the project will be built post 2020, the SCAQMD efficiency threshold at the project level of 3.0 MTCOeq/year per SP was utilized for this analysis.

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

On March 3, 2017, the SCAQMD Governing Board adopted the 2016 AQMP, which incorporates the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, 2016–2040 RTP/SCS, and updated emission inventory methodologies for various source categories. According to the SCAQMD's CEQA Air Quality Handbook, two main criteria must be addressed.

Criterion 1:

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

a) *Would the project result in an increase in the frequency or severity of existing air quality violations?*

   Since the consistency criteria identified under the first criterion pertain to pollutant concentrations, rather than to total regional emissions, an analysis of a project's pollutant emissions relative to localized pollutant concentrations associated with the CAAQS and NAAQS is used as the basis for evaluating project consistency. As discussed under Impact Statements AQ-2 and AQ-3, the project's short-term construction emissions, long-term operational emissions, and localized concentrations of CO, NO_X, PM_{10}, and $PM_{2.5}$ would be less than significant during project construction and operations. Therefore, the project would not result in an increase in the frequency or severity of existing air quality violations. Because VOCs are not a criteria pollutant, there is no ambient standard or localized threshold for VOCs. Due to the role VOC plays in O3 formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established. As such, the project would not cause or contribute to localized air quality violations or delay the attainment of air quality standard or interim emissions reductions specified in the AQMP.

b) *Would the project cause or contribute to new air quality violations?*

   As discussed in Impact Statement AQ-2, construction and operations of the proposed project would result in emissions that would be below the SCAQMD construction and operational thresholds. Therefore, the proposed project would not have the potential to cause or affect a violation of the ambient air quality standards.

c) *Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?*

   As discussed in Impact Statement AQ-3, the proposed project would result in less than significant impacts with regard to localized concentrations during project operations. As such, the proposed project would not delay the timely attainment of air quality standards or 2016 AQMP emissions reductions.

Criterion 2:

With respect to the second criterion for determining consistency with SCAQMD and SCAG air quality policies, it is important to recognize that air quality planning within the Basin focuses on attainment of ambient air quality standards at the earliest feasible date. Projections for achieving air quality goals are based on assumptions regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining project consistency focuses on whether or not the project exceeds the assumptions utilized in preparing the forecasts presented in the 2016 AQMP. Determining whether or not a project exceeds the assumptions reflected in the 2016 AQMP involves the evaluation of the following criterion.

a) *Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?*

In the case of the 2016 AQMP, three sources of data form the basis for the projections of air pollutant emissions: the General Plan, SCAG's *Growth Management* Chapter of the *Regional Comprehensive Plan* (RCP), and SCAG's 2016-2040 RTP/SCS. The 2016–2040 RTP/SCS also provides socioeconomic forecast projections of regional population growth. The project site is designated "High Density Residential" by the *Land Use Plan* of the General Plan and "Multiple Family Residence District (R-3)" by the *Zoning Map*. The project site is also designated R-3 Arroyo Residential Zone in the Mission District Specific Plan. The project proposes to construct a new four-story residential building encompassing 41 condominium units. The Specific Plan characterizes the R-3 Arroyo Residential Zone as a residential area that includes the natural fresh-water landscape and amenities such as pathways, trees, courtyards, and functional pedestrian alleys.

The proposed project is considered consistent with the General Plan and Specific Plan designations as the project involves residential uses with natural fresh-water landscape and courtyards. Thus, the proposed project is consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the RCP. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the City; these are used by SCAG in all phases of implementation and review. Additionally, as the SCAQMD has incorporated these same projections into the 2016 AQMP, it can be concluded that the proposed project would be consistent with the projections.

b) *Would the project implement all feasible air quality mitigation measures?*

Compliance with all feasible emission reduction measures identified by the SCAQMD would be required as identified in Impact Statement AQ-2 and AQ-3. As such, the proposed project would meet this AQMP consistency criterion.

c) *Would the project be consistent with the land use planning strategies set forth in the AQMP?*

As discussed in Impact Section GHG-2, the project would implement various SCAG policies and would be consistent with the SCAG 2016-2040 RTP/SCS. Furthermore, the proposed project is an infill project located within a developed portion of the City and would be within a quarter mile of a major transit stop, which would incentive residents to take public transportation, which would lower criteria pollutant emissions and is consistent with the goals of SB 375. In addition, the project site is located along Arroyo Drive in the vicinity of multi-family residential uses. As such, the proposed project meets this AQMP consistency criterion.

In conclusion, the determination of 2016 AQMP consistency is primarily concerned with the long-term influence of a project on air quality in the Basin. The proposed project would not result in a long-term impact on the region's ability to meet State and Federal air quality standards. Also, the proposed project would be consistent with the goals and policies of the AQMP for control of fugitive dust. As discussed above, the proposed project's long-term influence would also be consistent with the SCAQMD and SCAG's goals and policies and is, therefore, considered consistent with the 2016 AQMP.

Mitigation Measures: Refer to Mitigation Measures AQ-1 and AQ-2, below.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-2 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF ANY CRITERIA POLLUTANT FOR WHICH THE REGION IS NONATTAINMENT FOR FEDERAL OR STATE STANDARDS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

SHORT-TERM CONSTRUCTION

Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage. The demolition and construction process is anticipated to occur over approximately 17 months.

Construction activities would include demolition, site preparation, grading, paving, building construction, and architectural coating. Site grading would disturb approximately two acres and require approximately 4,417 cubic yards of soil export to accommodate one subterranean level of parking structure. Due to the slope of the project site, grading would require approximately 6,523 cubic yards of cut and 2,106 cubic yards of fill. Project construction requires concrete/industrial saws, rubber tired dozers, and tractors/loaders/backhoes during demolition; graders, scrapers, and tractors/loaders/backhoes during site preparation; graders, rubber tired dozers, and tractors/loaders/backhoes during grading; cranes, forklifts, generators, tractors, and welders during building construction; cement and mortar mixers, pavers, rollers, tractors, and paving equipment during paving; and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model version 2016.3.2 (CalEEMod). Refer to Appendix A, *Air Quality/Greenhouse Gas Emissions Data*, for the CalEEMod outputs and results. Table 5, *Maximum Daily Construction Emissions*, presents the anticipated daily short-term construction emissions.

Table 5
Maximum Daily Construction Emissions

Emissions Source	Pollutant (pounds/day) [1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 1						
Unmitigated Construction Emissions	4.19	39.65	26.76	0.05	8.55	5.15
Mitigated Construction Emissions[2]	4.19	39.65	26.76	0.05	4.83	3.12
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Is Threshold Exceeded After Mitigation?	***No***	***No***	***No***	***No***	***No***	***No***
Year 2						
Unmitigated Construction Emissions	5.30	25.10	28.23	0.05	1.95	1.33
Mitigated Construction Emissions[2]	5.30	25.10	28.23	0.05	1.91	1.32
SCAQMD Thresholds	***75***	***100***	***550***	***150***	***150***	***55***
Is Threshold Exceeded After Mitigation?	***No***	***No***	***No***	***No***	***No***	***No***

Notes:
1. Emissions were calculated using CalEEMod version 2016.3.2, as recommended by the SCAQMD.
2. The mitigation reduction/credits for construction emissions are based on mitigation included in CalEEMod and are required by the SCAQMD Rules. The mitigation applied in CalEEMod includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stock piles with tarps; water all haul roads twice daily; and limit speeds on unpaved roads to 15 miles per hour. The emissions results in this table represent the "mitigated" emissions shown in Appendix A.

Refer to Appendix A, *Air Quality/Greenhouse Gas Data*, for assumptions used in this analysis.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10} and $PM_{2.5}$) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project area. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill, and truck travel on unpaved roadways (including demolition as well as construction activities). Fugitive dust emissions vary substantially from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive dust from demolition, grading, and construction is expected to be short-term and would cease upon project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health.

Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. PM_{10} poses a serious health hazard alone or in combination with other pollutants. Fine Particulate Matter ($PM_{2.5}$) is mostly produced by mechanical processes. These include automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. $PM_{2.5}$ is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary sources. These particles are either directly emitted or are formed in the atmosphere from the combustion of gases such as NO_X and SO_X combining with ammonia. $PM_{2.5}$ components from material in the earth's crust, such as dust, are also present, with the amount varying in different locations.

Mitigation Measures AQ-1 and AQ-2 require implementation of dust control techniques to reduce PM_{10} and $PM_{2.5}$ concentrations in compliance with *Mission District Specific Plan Program EIR* Mitigation Measures AQ1 and AQ3. These are standard dust control measures that the SCAQMD requires for all projects and are required for all projects located within the Specific Plan area. As indicated in Table 5, total PM_{10} and $PM_{2.5}$ emissions would be below the SCAQMD threshold the implementation of Mitigation Measures AQ-1 and AQ-2. Therefore, particulate matter impacts during construction would be less than significant.

ROG Emissions[19]

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O_3 precursors. In accordance with the methodology prescribed by the SCAQMD, the ROG emissions associated with paving have been quantified with CalEEMod. Architectural coatings were also quantified with CalEEMod based upon the size of the buildings.

The highest concentration of ROG emissions would be generated during the application of architectural coatings on the building. As required by law, all architectural coatings for the proposed project structures would comply with SCAQMD Regulation XI, Rule 1113 –

[19] ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

Architectural Coating.[20] Rule 1113 provides specifications on painting practices as well as regulates the ROG content of paint. As shown in Table 5, project construction would not result in an exceedance of ROG emissions during any years of construction. Therefore, impacts would be less than significant in this regard.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Standard SCAQMD regulations, such as maintaining all construction equipment in proper tune, shutting down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403 would be adhered to. As noted in Table 5, construction equipment exhaust would not exceed SCAQMD thresholds. Therefore, impacts are less than significant in this regard.

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board in 1986.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. According to the Department of Conservation Division of Mines and Geology, *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report* (August 2000), serpentinite and ultramafic rocks are not known to occur within the project area. Thus, there would be no impact in this regard.

Construction Odors

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are

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[20] South Coast Air Quality Management District, *Regulation XI Source Specific Standards,* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=15, accessed on June 23, 2019.

common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would disperse rapidly. Therefore, construction odors are not considered to be a significant impact.

Total Daily Construction Emissions

In accordance with the SCAQMD Guidelines, CalEEMod was utilized to model construction emissions for ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$. Construction would occur over a two-year period with the greatest emissions being generated during the initial stages of construction. Additionally, the greatest amount of ROG emissions would typically occur during the final stages of development due to the application of architectural coatings.

CalEEMod allows the user to input mitigation measures such as watering the construction area to limit fugitive dust. Mitigation measures that were input into CalEEMod allow for certain reduction credits and result in a decrease of pollutant emissions. Reduction credits are based upon studies developed by CARB, SCAQMD, and other air quality management districts throughout California, and were programmed within CalEEMod. As indicated in Table 5, CalEEMod calculates the reduction associated with recommended mitigation measures.

As depicted in Table 5, construction emissions would be less than significant with implementation of required Mitigation Measures AQ-1 and AQ-2. Thus, construction related air emissions would not result in a cumulatively considerable net increase of any criteria pollutant and a less than significant impact would occur.

LONG-TERM OPERATIONAL EMISSIONS

Mobile Source Emissions

Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ are all pollutants of regional concern (NO_X and ROG react with sunlight to form O_3 [photochemical smog], and wind currents readily transport SO_X, PM_{10}, and $PM_{2.5}$). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

The project-generated vehicle emissions have been estimated using CalEEMod. Trip generation rates associated with the project were based on traffic data within the *Arroyo Village Condo Development: Traffic Impact Analysis (TIA) Report* (Traffic Impact Study) prepared by Traffic Design, Inc. (dated June 20, 2019). The proposed project would generate approximately 238 daily trips. Table 6, *Long-Term Air Emissions*, presents the anticipated mobile source emissions. As shown in Table 6, emissions generated by vehicle traffic associated with the proposed project would not exceed established SCAQMD regional thresholds.

Table 6
Long-Term Air Emissions

Scenario	Emissions (pounds per day)[1]					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Project Summer Emissions						
Area Source	1.07	0.62	3.64	0.00	0.07	0.07
Energy Source	0.02	0.18	0.08	0.00	0.01	0.01
Mobile	0.41	2.02	5.51	0.02	1.74	0.48
Total Maximum Daily Emissions[2]	**1.50**	**2.81**	**9.22**	**0.03**	**1.82**	**0.56**
SCAQMD Regional Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**
Project Winter Emissions						
Area Source	1.07	0.62	3.64	0.00	0.07	0.07
Energy Source	0.02	0.18	0.08	0.00	0.01	0.01
Mobile	0.39	2.06	5.17	0.02	1.74	0.48
Total Maximum Daily Emissions	**1.48**	**2.86**	**8.89**	**0.02**	**1.82**	**0.56**
SCAQMD Regional Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
1. Emissions were calculated using CalEEMod version 2016.3.2, as recommended by the SCAQMD.
2. The numbers may be slightly off due to rounding.

Refer to Appendix A for assumptions used in this analysis.

Area Source Emissions

Area source emissions would be generated due to an increased demand for consumer products, architectural coating, and landscaping associated with the proposed project. The proposed project would not include wood burning fireplaces or other devices per SCAQMD Rule 445 (Wood Burning Devices). As shown in Table 6, unmitigated area source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Energy Source Emissions

Energy source emissions would be generated as a result of electricity and natural gas (non-hearth) usage associated with the proposed project. The primary use of electricity and natural gas by the project would be for space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. As shown in Table 6, unmitigated energy source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Air Quality Health Impacts

Adverse health effects 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 individual [e.g., age, gender]). In particular, ozone precursors VOCs and NO_x affect air quality on a regional scale. Health effects related to ozone are therefore the product of emissions generated by numerous sources throughout a region. Existing models have limited sensitivity to small changes in criteria pollutant concentrations, and, as such, translating project-generated criteria pollutants to specific health effects or additional days of nonattainment would produce meaningless results. In other words, the project's less than significant increases in regional air pollution from criteria air pollutants would have nominal or negligible impacts on human health.

As noted in the Brief of Amicus Curiae by the SCAQMD (April 6, 2015), the SCAQMD acknowledged it would be extremely difficult, if not impossible to quantify health impacts of criteria pollutants for various reasons including modeling limitations as well as where in the atmosphere air pollutants interact and form. Further, as noted in the Brief of Amicus Curiae by the San Joaquin Valley Air Pollution Control District (SJVAPCD) (April 13, 2015), SJVAPCD has acknowledged that currently available modeling tools are not equipped to provide a meaningful analysis of the correlation between an individual development project's air emissions and specific human health impacts.

The SCAQMD acknowledges that health effects quantification from ozone, as an example is correlated with the increases in ambient level of ozone in the air (concentration) that an individual person breathes. SCAQMD's Brief of Amicus Curiae states that it would take a large amount of additional emissions to cause a modeled increase in ambient ozone levels over the entire region. The SCAQMD states that based on their own modeling in the SCAQMD's *2012 Air Quality Management Plan*, a reduction of 432 tons (864,000 pounds) per day of NO_x and a reduction of 187 tons (374,000 pounds) per day of VOCs would reduce ozone levels at highest monitored site by only nine parts per billion. As such, the SCAQMD concludes that it is not currently possible to accurately quantify ozone-related health impacts caused by NO_x or VOC emissions from relatively small projects (defined as projects with regional scope) due to photochemistry and regional model limitations. Thus, as the project would not exceed SCAQMD thresholds for construction and operational air emissions, the project would have a less than significant impact for air quality health impacts.

Conclusion

As indicated in Table 6, operational emissions from the proposed project would not exceed SCAQMD thresholds. If stationary sources, such as backup generators, are installed on-site, they would be required to obtain the applicable permits from SCAQMD for operation of such equipment. The SCAQMD is responsible for issuing permits for the operation of stationary sources in order to reduce air pollution, and to attain and maintain the national and California ambient air quality standards in the Basin. If backup generators are required, they would be used only in emergency situations, and would not contribute a substantial amount of emissions capable of exceeding SCAQMD thresholds. Thus, long-term operational air emissions impacts would not result in a cumulatively considerable net increase of any criteria pollutant and impacts would be less than significant.

Mitigation Measures:

AQ-1 Prior to issuance of any Grading Permit, the City Engineer and the Chief Building Official shall confirm that the Grading Plan, Building Plans, and specifications stipulate that, in compliance with SCAQMD Rule 403, excessive fugitive dust emissions shall be controlled by regular watering or other dust prevention measures, as specified in the SCAQMD's Rules and Regulations. In addition, SCAQMD Rule 402 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Implementation of the following measures would reduce short-term fugitive dust impacts on nearby sensitive receptors:

- All active portions of the construction site shall be watered every three hours during daily construction activities and when dust is observed migrating from the project site to prevent excessive amounts of dust.

- Pave or apply water every three hours during daily construction activities or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas. More frequent watering shall occur if dust is observed migrating from the site during site disturbance.

- Any on-site stockpiles of debris or on-site haul roads, dirt, or other dusty material shall be enclosed, covered, or watered three times daily, or non-toxic soil binders shall be applied.

- All grading and excavation operations shall be suspended when wind speeds exceed 25 miles per hour.

- Disturbed areas shall be replaced with ground cover or paved immediately after construction is completed in the affected area.

- Track-out devices such as gravel bed track-out aprons (3 inches deep, 25 feet long, 12 feet wide per lane and edged by rock berm or row of stakes) shall be installed to reduce mud/dirt trackout from unpaved truck exit routes. Alternatively, a wheel washer shall be used at truck exit routes.

- On-site vehicle speed shall be limited to 15 miles per hour.

- All material transported off-site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust prior to departing the job site.

- Reroute construction trucks away from congested streets or sensitive receptor areas.

(Mitigation Measure AQ-1 correlates with Mitigation Measure AQ1 in the Mission District Specific Plan Program EIR. This mitigation measure includes updates to reflect the latest practices and recommendations from the SCAQMD).

AQ-2 All trucks that are to haul excavated or graded material on-site shall comply with State Vehicle Code Section 23114 (*Spilling Loads on Highways*), with special attention to Sections 23114(b)(F), (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads. Prior to the issuance of grading permits, the Applicant shall demonstrate to the City of San Gabriel City Engineer how the project operations subject to that specification during hauling activities shall comply with the provisions set forth in Sections 23114(b)(F), (e)(4).

(Mitigation Measure AQ-2 correlates with Mitigation Measure AQ3 in the Mission District Specific Plan Program EIR. This mitigation measure includes updates to reflect the latest practices and recommendations).

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-3 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

Sensitive receptors near the project site include surrounding residences adjacent to all sides of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operations impacts (area sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

Localized Significance Thresholds (LST)

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated June 2003 [revised 2008]) for guidance. The LST methodology assists lead agencies in analyzing localized air quality impacts. The SCAQMD provides the LST screening lookup tables for one, two, and five acre projects emitting CO, NO_X, $PM_{2.5}$, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. The project is located within Source Receptor Area (SRA) 8, West San Gabriel Valley.

Construction

The SCAQMD guidance on applying CalEEMod to LSTs specifies the number of acres a particular piece of equipment would likely disturb per day. SCAQMD provides LST thresholds for one-, two-, and five-acre site disturbance areas; SCAQMD does not provide LST thresholds for projects over five acres. Table 7, *Project Maximum Daily Disturbed Acreage*, identifies the maximum daily disturbed acreage for the purposes of LST modeling. As shown, the project could actively disturb approximately two acres per day during the grading phase of construction.

Table 7
Project Maximum Daily Disturbed Acreage

Construction Phase	Equipment Type	Equipment Quantity	Acres Graded per 8-hour Day	Operating Hours per Day	Acres Graded per Day
Grading	Rubber Tired Dozers	1	0.5	8	0.5
	Tractors/Loaders/Backhoes	2	0.5	8	1
	Graders	1	0.5	8	0.5
	Scrapers	0	1	8	0
Total Acres Graded – Grading Phase					**2**
Source: South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, July 2008.					

The SCAQMD guidance on applying CalEEMod to LSTs specifies the number of acres a particular piece of equipment would likely disturb per day. Based on the SCAQMD guidance, the project would disturb approximately two acres of land per day during the grading phase. Therefore, the LST thresholds for two acres were conservatively utilized for the construction LST analysis. The closest sensitive receptors to the project site are residential uses located adjacent to the project site on all sides. These sensitive land uses may be potentially affected by air pollutant emissions generated during on-site construction activities. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. As the nearest sensitive uses are adjacent to the project site, the lowest available LST values for 25 meters were used.

Table 8, *Construction Localized Significance Emissions Summary*, shows the localized construction-related emissions for NO_X, CO, PM_{10}, and $PM_{2.5}$ compared to the LSTs for SRA 8. It is noted that the localized emissions presented in Table 8 are less than those in Table 5 because localized emissions include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As shown in Table 8, the project's localized construction emissions would not exceed the LSTs for SRA 8. Therefore, localized significance impacts from construction would be less than significant.

Table 8
Localized Significance of Construction Emissions

Phase	Emissions (pounds per day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Construction				
Year 1 On-Site Emissions[1,2]	20.21	14.49	3.27	2.13
SCAQMD Localized Threshold[3]	*98*	*812*	*6*	*4*
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**
Year 2 On-Site Emissions[2,4]	*14.60*	*14.35*	*0.70*	*0.67*
SCAQMD Localized Threshold[3]	*98*	*812*	*6*	*4*
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Notes:
1. The grading phase emissions during year 1 present the worst-case scenario for NOx, PM_{10}, and $PM_{2.5}$, and the demolition phase emissions during year present the worst-case scenario for CO.
2. The mitigation reduction/credits for construction emissions applied in CalEEMod are based on the application of dust control techniques as required by SCAQMD Rule 403. The dust control techniques include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces twice daily; cover stock piles with tarps; water all haul roads three times daily; and limit speeds on unpaved roads to 15 miles per hour.
3. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction (approximately 2 acre; therefore, the threshold for 2-acre was used), a distance of 82-feet (25) meters to the closest sensitive receptor, and the source receptor area (SRA 8).
4. The building construction phase emissions during year 2 present the worst-case scenario for NOx, CO, PM_{10}, and $PM_{2.5}$.

Refer to Appendix A for assumptions used in this analysis.

Operations

According to SCAQMD localized significance threshold methodology, LSTs would apply to the operational phase of a proposed project if the project includes stationary sources or attracts mobile sources that may spend extended periods queuing and idling at the site (e.g., warehouse or transfer facilities). Occasional truck trash pickup (once per week) would occur at the project site. These truck trash pickup activities would be intermittent and would not include extended periods of idling time; therefore, idling emissions from truck deliveries would be minimal. Additionally, potential emergency vehicle trips to and from the project site would be sporadic and would not idle on-site or along adjacent roadways for long periods of time. Thus, due to the lack of such emissions, no long-term LST analysis is necessary. Operational LST impacts would be less than significant in this regard.

Carbon Monoxide Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The Basin is designated as an attainment/maintenance area for the Federal CO standards and an attainment area for State standards. There has been a decline in CO emissions even though vehicle miles traveled on U.S. urban and rural roads have increased Nationwide estimated anthropogenic CO emissions have decreased 68 percent between 1990 and 2014. In 2014, mobile sources accounted for 82 percent of the nation's total anthropogenic CO emissions.[21] Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs.

According to the SCAQMD *CEQA Air Quality Handbook*, a potential CO hotspot may occur at any location where the background CO concentration already exceeds 9.0 parts per million (ppm), which is the 8-hour California ambient air quality standard. As previously discussed, the project is located in SRA 8, West San Gabriel Valley. Communities within SRAs are expected to have similar climatology and ambient air pollutant concentrations. The monitoring station representative of SRA 8 is the Pasadena monitoring station, which is located approximately 2.37 miles north of the project site. The highest CO concentration at the Pasadena monitoring station was measured at 1.95 ppm in 2018. As such, the background CO concentration near the project does not exceed or approach the 9.0 ppm threshold and a CO hotspot would not occur. Therefore, CO hotspot impacts would be less than significant in this regard.

Parking Structure Hotspots

Carbon monoxide concentrations are a function of vehicle idling time, meteorological conditions, and traffic flow. Therefore, parking structures (and particularly subterranean parking structures) tend to be of concern regarding CO hotspots, as they are enclosed spaces with frequent cars operating in cold start mode. A total of 97 vehicular parking spots would be constructed within the one-level subterranean parking structure and would be utilized by on-site residents and guests. The proposed project would be required to comply with the ventilation requirements of the International Mechanical Code (Section 403.5 [Public Garages]), which requires that mechanical ventilation systems for public garages operate automatically upon detection of a concentration of carbon monoxide of 25 ppm by approved detection devices. The 25-ppm trigger is the maximum allowable concentration for continuous exposure in any eight-hour period according to the American Conference of Governmental Industrial

[21] United States Environmental Protection Agency¸ Carbon Monoxide Emissions, https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=10, accessed by June 27, 2019.

Hygienists.[22] Impacts with regard to parking structure CO hotspots would be less than significant.

Localized Air Quality Health Impacts

As evaluated above, the project's air emissions would not exceed the SCAQMD's LST thresholds, and CO hotpots would not occur as a result of the proposed project. Therefore, the project would not exceed the most stringent applicable Federal or State ambient air quality standards for emissions of CO, NO_X, PM_{10}, or $PM_{2.5}$. It should be noted that the ambient air quality standards are developed and represent levels at which the most susceptible persons (e.g., children and the elderly) are protected. In other words, the ambient air quality standards are purposefully set in a stringent manner to protect children, elderly, and those with existing respiratory problems. Thus, an air quality health impact would be less than significant in this regard.

Conclusion

In conclusion, the project would not expose sensitive receptors to substantial pollutant concentrations as the project would not exceed the SCAQMD LST thresholds, would not cause a CO hotspot, and would not create a localized air quality health impact. A less than significant impact would occur in this regard.

Mitigation Measures: Refer to Mitigation Measures AQ-1 and AQ-2.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-4 CREATE OBJECTIONABLE ODORS AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust and architectural coatings. However, construction-related odors would be short-term in nature and cease upon project completion. In addition, the project

[22]INTEC Controls, *Carbon Monoxide (CO) Detection and Control Systems for Parking Structures, Guidelines for the Design Engineer*, http://www.inteccontrols.com/pdfs/CO_Parking_Garage_Design_Guidelines.pdf, Accessed June 3, 2019.

would be required to comply with the California Code of Regulations, Title 13, sections 2449(d)(3) and 2485, which minimizes the idling time of construction equipment either by shutting it off when not in use or by reducing the time of idling to no more than five minutes. This would further reduce the detectable odors from heavy-duty equipment exhaust. The project would also comply with the SCAQMD Regulation XI, *Rule 1113 – Architectural Coating*, which would minimize odor impacts from ROG emissions during architectural coating. Any impacts to existing adjacent land uses would be short-term and are less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance. *Less Than Significant Impact.*

PROJECT RELATED SOURCES OF GREENHOUSE GASES

GHG-1 GENERATE GREENHOUSE GAS EMISSIONS, EITHER DIRECTLY OR INDIRECTLY, THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT?

Level of Significance: *Less Than Significant Impact.*

Project-related GHG emissions would include emissions from direct and indirect sources. The proposed project would result in direct and indirect emissions of CO_2, N_2O, and CH_4, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. CalEEMod relies upon trip data within the project's Traffic Impact Study and project specific land use data to calculate emissions. The project proposes a residential use on the project site. Table 9, *Projected Annual Greenhouse Gas Emissions*, presents the estimated CO_2, N_2O, and CH_4 emissions of the proposed project. CalEEMod outputs are contained within Appendix A, *Air Quality/Greenhouse Gas Data*.

Reduced Greenhouse Gas Emissions

The proposed project includes design features that would further reduce project-related greenhouse gas emissions. The project would install water efficient irrigation systems and landscapes, as well as incorporate water reducing features and fixtures into the buildings per *Municipal Code* Sections 153.530 through 153.539 (Landscape Requirements). The proposed project would include recycling and composting services per AB 341, which would reduce GHG emissions from solid waste by 75 percent. The project is also within a quarter mile of a major transit stop and would improve nearby accessibility to South Arroyo Drive with the construction of a vehicular bridge with a pedestrian walkway over the Alhambra wash.

Table 9
Projected Annual Greenhouse Gas Emissions

Source	CO_2	CH_4		N_2O		Total Metric Tons of CO_2eq[2,3]
	Metric Tons/yr[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[1]	
Direct Emissions						
Construction (amortized over 30 years)	10.40	0.00	0.07	0.00	0.00	10.47
Area Source	0.69	0.00	0.02	0.00	0.00	0.71
Mobile Source	247.76	0.01	0.31	0.00	0.00	248.07
Total Direct Emissions[2]	**258.85**	**0.01**	**0.40**	**0.00**	**0.00**	**259.25**
Indirect Emissions						
Energy	109.36	0.00	0.12	0.00	0.41	109.89
Water Demand	12.27	0.07	1.76	0.00	0.52	14.55
Solid Waste	0.96	0.06	1.41	0.00	0.00	2.37
Total Indirect Emissions[2]	**122.59**	**0.13**	**3.29**	**0.00**	**0.93**	**126.81**
Total Project-Related Emissions[2]	***386.06 MTCO₂eq/yr***					
Total Project SP Emissions[4]	***2.95 MTCO₂eq/yr***					
Threshold of Significance	***3.0 MTCO₂eq/yr***					
Project Exceed Threshold?	***No***					

$MTCO_{2eq}$/yr = metric tons of carbon dioxide equivalent per year; $MTCO_2eq$/SP/yr = metric tons of carbon dioxide equivalent per service population per year

Notes:
1. Emissions were calculated using CalEEMod version 2016.3.2, as recommended by the SCAQMD.
2. Totals may be slightly off due to rounding.
3. Carbon dioxide equivalent values calculated using the United States Environmental Protection Agency Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed July 1, 2019.
4. Based on the City's average household size of 3.19 (California *Department of Finance, E-5 Population and Housing Estimates for Cities, Counties, and the State, January 1, 2011-2019, with 2010 Benchmark*, May 2019., http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5, accessed by July 1, 2019), the proposed project would have a service population of 131 residents (41 units × 3.18 persons per household = 131 residents). Using a service population of 131 residents, the project's annual GHG emissions per service population is 2.95 $MTCO2_{eq}$ (386.06 $MTCO2_{eq}$/yr ÷ 131 = 2.95 $MTCO2_{eq}$/sp/yr).

Refer to Appendix A for assumptions used in this analysis.

Furthermore, the project would comply with the 2019 Title 24 standards, which includes the installation of solar photovoltaic panels, and would reduce energy usage by 53 percent compared to the 2016 Title 24 standards.[23]

Direct Project-Related Sources of Greenhouse Gases

- Construction Emissions. Construction GHG emissions are typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions.[24] As seen in Table 9, the proposed project would result in 10.47

[23] California Energy Commission, *2019 Building Energy Efficiency Standards Fact Sheet*, March 2018.

[24] The project lifetime is based on the standard 30-year assumption of the South Coast Air Quality Management District (http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-13/ghg-meeting-13-minutes.pdf?sfvrsn=2).

$MTCO_2eq$/yr amortized over 30 years), which represents a total of 313.95 $MTCO_2eq$/yr from construction activities.

- Area Source. Area source emissions were calculated using CalEEMod and project-specific land use data. As noted in Table 9, the proposed project would result in 0.71 $MTCO_2eq$/yr of area source GHG emissions.

- Mobile Source. The CalEEMod model relies upon trip data within the Traffic Impact Study and project specific land use data to calculate mobile source emissions. The project would directly result in 248.07 $MTCO_2eq$/yr of mobile source-generated GHG emissions; refer to Table 9.

Indirect Project-Related Sources of Greenhouse Gases

- Energy Consumption. Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site via Southern California Edison (SCE). The project would indirectly result in 109.89 $MTCO_2eq$/yr due to energy consumption; refer to Table 9.

- Solid Waste. Solid waste associated with operations of the proposed project would result in 2.37 $MTCO_2eq$/yr; refer to Table 9.

- Water Demand. The project operations would result in a demand of approximately 3.82 million gallons of water per year. Emissions from indirect energy impacts due to water supply would result in 14.55 $MTCO_2eq$/yr; refer to Table 9.

Conclusion

As shown in Table 9, GHG emissions would be 2.95 $MTCO_2eq$/yr per SP, which is below the SCAQMD post-2020 3.0 $MTCO_2eq$/yr per SP threshold. Therefore, the proposed project would result in a less than significant impact with regard to GHG emissions.

Mitigation Measures: No mitigation measures are required.

Level of Significance: *Less Than Significant Impact.*

GHG PLAN CONSISTENCY

GHG-2 CONFLICT WITH AN APPLICABLE PLAN, POLICY, OR REGULATION ADOPTED FOR THE PURPOSE OF REDUCING THE EMISSIONS OF GREENHOUSE GASES?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

The City has not adopted a Climate Action Plan (CAP) or any other plan for the purpose of reducing the emissions of greenhouse gases. Thus, the GHG plan consistency for this project is based off the project's consistency with the 2016 RTP/SCS and 2017 Scoping Plan. The 2016 RTP/SCS is a regional growth-management strategy that targets per-capita GHG reduction from passenger vehicles and light-duty trucks in the Southern California region. The 2016 RTP/SCS incorporates local land use projections and circulation networks in city and county general plans. The 2017 Scoping Plan describes the approach California will take to reduce GHG emissions by 40 percent below 1990 levels by the year 2030.

Consistency with the SCAG 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

The 2016–2040 RTP/SCS is expected to help California reach its GHG reduction goals, with reductions in per capita transportation emissions of 9 percent by 2020 and 16 percent by 2035.[25] Furthermore, although there are no per capita GHG emission reduction targets for passenger vehicles set by CARB for 2040, the 2016–2040 RTP/SCS GHG emission reduction trajectory shows that more aggressive GHG emission reductions are projected for 2040.[26] The 2016–2040 RTP/SCS would result in an estimated 8-percent decrease in per capita passenger vehicle GHG emissions by 2020, 19-percent decrease in per capita passenger vehicle GHG emissions by 2035, and 21-percent decrease in per capita passenger vehicle GHG emissions by 2040. By meeting and exceeding the SB 375 targets for 2020 and 2035, as well as achieving an approximately 21-percent decrease in per capita passenger vehicle GHG emissions by 2040 (an additional 3-percent reduction in the five years between 2035 [18 percent] and 2040 [21 percent]), the 2016–2040 RTP/SCS is expected to fulfill and exceed its portion of SB 375 compliance with respect to meeting the state's GHG emission reduction goals.

The project would also be consistent with the following key GHG reduction strategies in SCAG's 2016–2040 RTP/SCS, which are based on changing the region's land use and travel patterns:

- Compact growth in areas accessible to transit;
- Jobs and housing closer to transit;
- New housing and job growth focused in High Quality Transit Areas (HQTA); and
- Biking and walking infrastructure to improve active transportation options, transit access.

The project represents an infill development within an urbanized area slated for development and already supported by existing transportation systems. Further, the project would be located within a High-Quality Transit Area (HQTA), which is defined by the 2016–2040

[25] California Air Resources Board, *Regional Greenhouse Gas Emission Reduction Targets Pursuant to SB 375*, Resolution 10-31.

[26] Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, p. 153, April 2016.

RTP/SCS as generally walkable transit villages or corridors that are within 0.5 mile of a well-serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours. Four bus lines currently serve the project site; Los Angeles County Metropolitan Transportation Authority (Metro) bus lines 176, 78/79/378.

At the regional level, the 2016–2040 RTP/SCS is an applicable plan adopted for the purpose of reducing GHGs. In order to assess the project's potential to conflict with the 2016–2040 RTP/SCS, this section also analyzes the project's land use assumptions for consistency with those utilized by SCAG in its Sustainable Communities Strategy. Generally, projects are considered consistent with the provisions and general policies of applicable City and regional land use plans and regulations, such as SCAG's Regional Transportation Plan/Sustainable Communities Strategy, if they are compatible with the general intent of the plans and would not preclude the attainment of their primary goals. Table 10, *Consistency with the 2016-2040 RTP/SCS*, demonstrates the project's consistency with the Actions and Strategies set forth in the 2016–2040 RTP/SCS.[27]

Table 10
Consistency with the 2016-2040 RTP/SCS

Actions and Strategies	Responsible Party(ies)	Project Consistency Analysis
Land Use Actions and Strategies		
Encourage the use of range-limited battery electric and other alternative fueled vehicles through policies and programs, such as, but not limited to, neighborhood oriented development, complete streets, and Electric (and other alternative fuel) Vehicle Supply Equipment in public parking lots.	Local Jurisdictions, Council of Government (COGs), SCAG, County Transportation Commission (CTCs)	**Consistent.** The project would not impair the City's or SCAG's ability to encourage the use of alternatively-fueled vehicles through various policies and programs. Specifically, the project would be required to comply with the California Green Building Standards Code Residential Mandatory Measure 4.106.4.2 *Electric Vehicle (EV) Charging for multifamily dwellings*. This measure requires the project to incorporate 3 EV charging spaces.
Collaborate with the region's public health professionals to enhance how SCAG addresses public health issues in its regional planning, programming, and project development activities.	SCAG, State, Local Jurisdictions	**Consistent.** The project would not impair the City's, SCAG's, or the state's ability to collaborate with the region's public health professionals regarding the integration of public health issues in regional planning. Furthermore, the project would improve nearby accessibility South Arroyo Drive with the construction of a vehicular bridge with a pedestrian walkway over the Alhambra wash.
Support projects, programs, and policies that support active and healthy community environments that encourage safe walking, bicycling, and physical activity by children, including, but not limited to development of complete streets, school siting policies, joint use agreements, and bicycle and pedestrian safety education.	Local Jurisdictions, SCAG	**Consistent.** See discussion above.
Support projects, programs, policies and regulations that encourage the development of complete communities, which includes a diversity	Local Jurisdictions, SCAG	**Consistent.** The project would construct a four-story residential building with 41 condominium units on an in-fill site that is within a quarter mile of a major transit stop.

27 As discussed in the 2016–2040 RTP/SCS, the actions and strategies included in the 2016–2040 RTP/SCS remain unchanged from those adopted in the 2012–2035 RTP/SCS.

Actions and Strategies	Responsible Party(ies)	Project Consistency Analysis
of housing choices and educational opportunities, jobs for a variety of skills and education, recreation and culture, and a full-range of shopping, entertainment and services all within a relatively short distance.		
Transportation Network Actions and Strategies		
Cooperate with stakeholders, particularly county transportation commissions and Caltrans, to identify new funding sources and/or increased funding levels for the preservation and maintenance of the existing transportation network.	SCAG, CTCs, Local Jurisdictions	**Consistent.** While this action/strategy is not directly applicable, and while the project would not impair the ability of SCAG, the CTCs, or the City to cooperate with stakeholders to identify new funding sources and/or increase funding levels, the project would support this action/strategy by connecting to the existing transportation network and improving sidewalk access, with appropriate design considerations to ensure travel safety and reliability.
Prioritize transportation investments to support compact infill development that includes a mix of land uses, housing options, and open/park space, where appropriate, to maximize the benefits for existing communities, especially vulnerable populations, and to minimize any negative impacts.	SCAG, CTCs, Local Jurisdictions	**Consistent.** The project would construct a four-story residential building with 41 condominium units on an in-fill site that is within a quarter mile of a major transit stop.
Explore and implement innovative strategies and projects that enhance mobility and air quality, including those that increase the walkability of communities and accessibility to transit via non-auto modes, including walking, bicycling, and neighborhood electric vehicles (NEVs) or other alternative fueled vehicles.	SCAG, CTCs, Local Jurisdictions	**Consistent.** The project is an infill development also located in a HQTA as designated by the 2016–2040 RTP/SCS. The project would also provide bicycle parking spaces and EV charging spaces for residents. Therefore, the project would serve to reduce vehicle trips and thus VMT, thereby contributing to a reduction in air pollutant and GHG emissions.
Collaborate with local jurisdictions to provide a network of local community circulators that serve new Transit Oriented Development (TOD), HQTAs, and neighborhood commercial centers providing an incentive for residents and employees to make trips on transit.	SCAG, CTCs, Local Jurisdictions	**Consistent.** The project would not impair the ability of SCAG, the CTCs, or the City to provide such a network of local community circulators that serve new TOD, HQTAs, and neighborhood commercial centers.
Develop first-mile/last-mile strategies on a local level to provide an incentive for making trips by transit, bicycling, walking, or neighborhood electric vehicle or other ZEV options.	CTCs, Local Jurisdictions	**Consistent.** The project would not impair the CTCs' or the City's ability to develop first-mile/last-mile strategies. In support of this action/ strategy, the project would be located within walking distance of local and regional transit.
Transportation Demand Management (TDM) Actions and Strategies		
Encourage the implementation of a Complete Streets policy that meets the needs of all users of the streets, roads and highways—including bicyclists, children, persons with disabilities, motorists, neighborhood electric vehicle (NEV) users, movers of commercial goods, pedestrians, users of public transportation and seniors—for safe and convenient travel in a manner that is suitable to the suburban and urban contexts within the region.	Local Jurisdictions, COGs, SCAG, CTCs	**Consistent.** In support of AB 1358, the design of the project would enhance the walkability of the project vicinity with the construction of the bridge over the Alhambra wash, as well as include long-term bicycle parking spaces and EV charging spaces.
Support work-based programs that encourage emission reduction strategies and incentivize active transportation commuting or ride-share modes.	SCAG, Local Jurisdictions	**Consistent.** As previously discussed, the project would reduce GHG emissions by complying with the 2019 Title 24 requirements, which include solar photovoltaic panels, install water efficient irrigation systems and landscapes, as well as incorporate water reducing features and fixtures into the buildings per SGMC Sections 153.530 through 153.539 (Landscape Requirements) and would improve nearby accessibility South Arroyo Drive with the construction of a vehicular bridge with a pedestrian walkway over the Alhambra wash.
Encourage the development of telecommuting programs by employers through review and revision of policies that may discourage alternative work options.	Local Jurisdictions, CTCs	**Consistent.** The project would not impair the City's or CTCs ability to encourage the development of telecommuting programs by employers.
Emphasize active transportation and alternative	State,	**Consistent.** The project would not impair the City's ability to develop

Actions and Strategies	Responsible Party(ies)	Project Consistency Analysis
fueled vehicle projects as part of complying with the Complete Streets Act (AB 1358).	SCAG, Local Jurisdictions	infrastructure plans and education programs to promote active transportation options and other alternative fueled vehicles.
Transportation System Management (TSM) Actions and Strategies		
Work with relevant state and local transportation authorities to increase the efficiency of the existing transportation system.	SCAG, Local Jurisdictions, State	**Consistent.** The project would not impair the ability of SCAG, the City, or the State to work with relevant transportation authorities to increase the efficiency of the existing transportation system. Moreover, all sidewalks and internal driveways would be designed to conform to City requirements. In addition, the project site is located in a HQTA as designated by the 2016 RTP/SCS.
Source: Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016.		

In summary, the project is the type of land use development that is encouraged by the RTP/SCS to reduce VMT and expand multi-modal transportation options in order for the region to achieve the GHG reductions from the land use and transportation sectors required by SB 375, which, in turn, advances the state's long-term climate policies. By furthering implementation of SB 375, the project supports regional land use and transportation GHG reductions consistent with state regulatory requirements

Consistency with the 2017 CARB Scoping Plan

The 2017 Scoping Plan identifies additional GHG reduction measures necessary to achieve the 2030 target. These measures build upon those identified in the first update to the Scoping Plan (2013). Although a number of these measures are currently established as policies and measures, some measures have not yet been formally proposed or adopted. It is expected that these measures or similar actions to reduce GHG emissions will be adopted as required to achieve statewide GHG emissions targets. Provided in Table 11, *Consistency with the 2017 Scoping Plan*, is an evaluation of applicable reduction actions/strategies by emissions source category to determine how the project would be consistent with or exceed reduction actions/strategies outlined in the First Update to the Scoping Plan.

Conclusion

In summary, the plan consistency analysis provided above demonstrates that the project complies with or exceeds the plans, policies, regulations and GHG reduction actions/strategies outlined in the 2016-2040 RTP/SCS, and the 2017 Scoping Plan. Therefore, the project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of GHGs. Furthermore, because the project is consistent and does not conflict with these plans, policies, and regulations, the project's incremental increase in GHG emissions as described above would not result in a significant impact on the environment. Therefore, project-specific impacts with regard to climate change would be less than significant.

Table 11
Consistency with the 2017 Scoping Plan

Actions and Strategies	Project Consistency Analysis
SB 350	
Achieve a 50 percent Renewables Portfolio Standard (RPS) by 2030, with a doubling of energy efficiency savings by 2030.	The project would not be an electrical provider or would delay the goals of SB 350. Furthermore, the project would utilize electricity from SCE which would be required to comply with SB 350. As the project would use the electricity from SCE, the project would be in compliance with SB 350.
Low Carbon Fuel Standard (LCFS)	
Increase stringency of carbon fuel standards; reduce the carbon intensity of fuels by 18 percent by 2030, which is up from 10 percent in 2020.	Motor vehicles driven by the proposed project's residents would be required to use LCFS complaint fuels, thus the project would be in compliance with this Goal.
Mobile Source Strategy (Cleaner Technology and Fuels Scenario)	
Maintain existing GHG standards of light and heavy-duty vehicles while adding an addition 4.2 million zero-emission vehicles (ZEVs) on the road. Increase the number of ZEV buses, delivery trucks, or other trucks.	The project would not include any light or heavy-duty truck trips. Furthermore, the project would be required to comply with CalGreen and would include electric vehicle parking and charging stations. As such, the project would not conflict with the goals of the Mobile Source Strategy.
Sustainable Freight Action Plan	
Improve the freight system efficiency and maximize the use of near zero emission vehicles and equipment powered by renewable energy. Deploy over 100,000 zero-emission trucks and equipment by 2030.	The project would not include any freight systems. Therefore, the project would not conflict with the Sustainable Freight Action Plan.
Short-Lived Climate Pollutant (SLCP) Reduction Strategy	
Reduce the GHG emissions of methane and hydrofluorocarbons by 40 percent below the 2013 levels by 2030. Furthermore, reduce the emissions of black carbon by 50 percent below the 2013 levels by the year 2030.	The project does not involve would include sources that would emit large amounts of methane (refer to Table 9). Furthermore, the project would comply with all CARB and SCAQMD hydrofluorocarbon regulations. As such, the project would not conflict with the SLCP reduction strategy.
SB 375 Sustainable Communities Strategies	
Increase the stringency of the 2035 GHG emission per capita reduction target for metropolitan planning organizations (MPO).	As shown in Table 10, the project would be consistent with the 2016-2040 RTP/SCS and would not conflict with the goals of SB 375.
Post-2020 Cap and Trade Programs	
The Cap-and-Trade Program will reduce greenhouse gas (GHG) emissions from major sources (covered entities) by setting a firm cap on statewide GHG emissions while employing market mechanisms to cost-effectively achieve the emission-reduction goals.	The project would not be a gross emitter of CO2e emissions (25,000 Metric tons per year), and thus would be exempt from the Cap and Trade program. The project would not conflict with this goal.
Source: California Air Resources board, 2017 Scoping Plan, November 2017.	

Mitigation Measures: No mitigation measures are required.

Level of Significance: *Less Than Significant Impact.*

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6.1 LIST OF PREPARERS

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APPENDIX A: AIR QUALITY/GREENHOUSE GAS DATA

Arroyo Village Residential Condominium Project

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	36.00	1000sqft	0.83	36,000.00	0
Parking Lot	7.00	Space	0.06	2,800.00	0
Condo/Townhouse	41.00	Dwelling Unit	1.12	41,000.00	117

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	549	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Per SCE 2017 Sustainability Report (pg 10).

Land Use - Lot Size

Construction Phase - Anticipated Construction Schedule

Off-road Equipment -

Off-road Equipment - .

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - .

Demolition -

Grading - Lot Size is 1.16 with 4,416 cy of soil to be exported..

Vehicle Trips - Project is anticipated to generate approximately 238 daily trips.

Woodstoves - No Woodstoves/Fireplaces

Energy Use -

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation - 2019 Title 24 (P/V)

Water Mitigation -

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	66.00
tblConstructionPhase	NumDays	220.00	217.00
tblConstructionPhase	NumDays	6.00	132.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	3.00	44.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblGrading	AcresOfGrading	66.00	1.16
tblGrading	AcresOfGrading	66.00	0.00
tblGrading	MaterialExported	0.00	4,417.00
tblLandUse	LotAcreage	2.56	1.12
tblProjectCharacteristics	CO2IntensityFactor	702.44	549
tblVehicleTrips	HO_TTP	40.60	41.00
tblVehicleTrips	HS_TTP	19.20	19.00

tblVehicleTrips	HW_TTP	40.20	40.00
tblVehicleTrips	ST_TR	5.67	5.80
tblVehicleTrips	SU_TR	4.84	5.80
tblVehicleTrips	WD_TR	5.81	5.80
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

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					
2021	0.2567	2.5910	1.6270	3.5500e-003	0.4358	0.1142	0.5500	0.2283	0.1062	0.3346	0.0000	312.0593	312.0593	0.0758	0.0000	313.9547
2022	0.3185	1.4346	1.5443	2.9900e-003	0.0499	0.0666	0.1165	0.0134	0.0635	0.0769	0.0000	255.7682	255.7682	0.0436	0.0000	256.8584
Maximum	**0.3185**	**2.5910**	**1.6270**	**3.5500e-003**	**0.4358**	**0.1142**	**0.5500**	**0.2283**	**0.1062**	**0.3346**	**0.0000**	**312.0593**	**312.0593**	**0.0758**	**0.0000**	**313.9547**

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					
2021	0.2567	2.5910	1.6270	3.5500e-003	0.1894	0.1142	0.3036	0.0943	0.1062	0.2006	0.0000	312.0590	312.0590	0.0758	0.0000	313.9544
2022	0.3185	1.4346	1.5443	2.9900e-003	0.0474	0.0666	0.1139	0.0128	0.0635	0.0763	0.0000	255.7680	255.7680	0.0436	0.0000	256.8582

Maximum	**0.3185**	**2.5910**	**1.6270**	**3.5500e-003**	**0.1894**	**0.1142**	**0.3036**	**0.0943**	**0.1062**	**0.2006**	**0.0000**	**312.0590**	**312.0590**	**0.0758**	**0.0000**	**313.9544**

	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**	**51.25**	**0.00**	**37.35**	**55.71**	**0.00**	**32.72**	**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	**1-1-2021**	**3-31-2021**	0.6701	0.6701
2	**4-1-2021**	**6-30-2021**	0.7548	0.7548
3	**7-1-2021**	**9-30-2021**	0.7701	0.7701
4	**10-1-2021**	**12-31-2021**	0.6409	0.6409
5	**1-1-2022**	**3-31-2022**	0.5725	0.5725
6	**4-1-2022**	**6-30-2022**	0.5780	0.5780
7	**7-1-2022**	**9-30-2022**	0.4200	0.4200
		Highest	0.7701	0.7701

2.2 Overall Operational

<u>Unmitigated Operational</u>

	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	0.1777	0.0121	0.4269	7.0000e-005		2.9200e-003	2.9200e-003		2.9200e-003	2.9200e-003	0.0000	9.0605	9.0605	8.3000e-004	1.5000e-004	9.1270
Energy	3.8000e-003	0.0325	0.0138	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	141.8160	141.8160	6.2300e-003	1.8300e-003	142.5164
Mobile	0.0696	0.3824	0.9555	3.6300e-003	0.3084	2.9000e-003	0.3113	0.0826	2.7000e-003	0.0854	0.0000	335.3527	335.3527	0.0159	0.0000	335.7506
Waste						0.0000	0.0000		0.0000	0.0000	3.8284	0.0000	3.8284	0.2263	0.0000	9.4847
Water						0.0000	0.0000		0.0000	0.0000	0.8475	13.3211	14.1685	0.0878	2.2000e-003	17.0181
Total	**0.2511**	**0.4270**	**1.3962**	**3.9100e-003**	**0.3084**	**8.4400e-003**	**0.3169**	**0.0826**	**8.2400e-003**	**0.0909**	**4.6759**	**499.5503**	**504.2262**	**0.3370**	**4.1800e-003**	**513.8968**

Mitigated Operational

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					
Area	0.1769	4.8900e-003	0.4238	2.0000e-005		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	0.6917	0.6917	6.7000e-004	0.0000	0.7085
Energy	2.5300e-003	0.0216	9.2100e-003	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	109.3563	109.3563	4.9300e-003	1.3800e-003	109.8911
Mobile	0.0610	0.3199	0.7375	2.6800e-003	0.2232	2.1700e-003	0.2254	0.0598	2.0200e-003	0.0618	0.0000	247.7613	247.7613	0.0123	0.0000	248.0692
Waste						0.0000	0.0000		0.0000	0.0000	0.9571	0.0000	0.9571	0.0566	0.0000	2.3712
Water						0.0000	0.0000		0.0000	0.0000	0.6780	11.5887	12.2667	0.0703	1.7700e-003	14.5506
Total	**0.2404**	**0.3465**	**1.1705**	**2.8400e-003**	**0.2232**	**6.2600e-003**	**0.2295**	**0.0598**	**6.1100e-003**	**0.0659**	**1.6351**	**369.3981**	**371.0331**	**0.1447**	**3.1500e-003**	**375.5905**

	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	**4.27**	**18.85**	**16.16**	**27.37**	**27.64**	**25.83**	**27.59**	**27.64**	**25.85**	**27.47**	**65.03**	**26.05**	**26.42**	**57.05**	**24.64**	**26.91**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	1/28/2021	5	20	
2	Site Preparation	Site Preparation	1/29/2021	3/31/2021	5	44	
3	Grading	Grading	3/31/2021	9/30/2021	5	132	
4	Building Construction	Building Construction	9/30/2021	7/29/2022	5	217	
5	Paving	Paving	7/29/2022	9/28/2022	5	44	
6	Architectural Coating	Architectural Coating	9/28/2022	12/28/2022	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.16

Acres of Paving: 0.89

Residential Indoor: 83,025; Residential Outdoor: 27,675; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	5	13.00	0.00	25.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	552.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	46.00	11.00	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	9.00	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

Clean Paved Roads

3.2 Demolition - 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					
Fugitive Dust					2.6800e-003	0.0000	2.6800e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**	**2.6800e-003**	**0.0104**	**0.0131**	**4.1000e-004**	**9.7100e-003**	**0.0101**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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	1.0000e-004	3.3400e-003	7.4000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.9381	0.9381	7.0000e-005	0.0000	0.9398
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	5.4000e-004	4.0000e-004	4.5400e-003	1.0000e-005	1.4300e-003	1.0000e-005	1.4400e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2437	1.2437	3.0000e-005	0.0000	1.2445
Total	**6.4000e-004**	**3.7400e-003**	**5.2800e-003**	**2.0000e-005**	**1.6400e-003**	**2.0000e-005**	**1.6600e-003**	**4.4000e-004**	**2.0000e-005**	**4.6000e-004**	**0.0000**	**2.1817**	**2.1817**	**1.0000e-004**	**0.0000**	**2.1843**

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					1.0400e-003	0.0000	1.0400e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**	**1.0400e-003**	**0.0104**	**0.0115**	**1.6000e-004**	**9.7100e-003**	**9.8700e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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	1.0000e-004	3.3400e-003	7.4000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.9381	0.9381	7.0000e-005	0.0000	0.9398

	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
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	5.4000e-004	4.0000e-004	4.5400e-003	1.0000e-005	1.3500e-003	1.0000e-005	1.3600e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2437	1.2437	3.0000e-005	0.0000	1.2445
Total	**6.4000e-004**	**3.7400e-003**	**5.2800e-003**	**2.0000e-005**	**1.5600e-003**	**2.0000e-005**	**1.5800e-003**	**4.2000e-004**	**2.0000e-005**	**4.4000e-004**	**0.0000**	**2.1817**	**2.1817**	**1.0000e-004**	**0.0000**	**2.1843**

3.3 Site Preparation - 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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0340	0.4023	0.2365	5.4000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	47.3582	47.3582	0.0153	0.0000	47.7411
Total	**0.0340**	**0.4023**	**0.2365**	**5.4000e-004**	**0.0000**	**0.0154**	**0.0154**	**0.0000**	**0.0142**	**0.0142**	**0.0000**	**47.3582**	**47.3582**	**0.0153**	**0.0000**	**47.7411**

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	7.3000e-004	5.4000e-004	6.1400e-003	2.0000e-005	1.9300e-003	1.0000e-005	1.9500e-003	5.1000e-004	1.0000e-005	5.3000e-004	0.0000	1.6837	1.6837	5.0000e-005	0.0000	1.6848
Total	**7.3000e-004**	**5.4000e-004**	**6.1400e-003**	**2.0000e-005**	**1.9300e-003**	**1.0000e-005**	**1.9500e-003**	**5.1000e-004**	**1.0000e-005**	**5.3000e-004**	**0.0000**	**1.6837**	**1.6837**	**5.0000e-005**	**0.0000**	**1.6848**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0340	0.4023	0.2365	5.4000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	47.3581	47.3581	0.0153	0.0000	47.7410
Total	**0.0340**	**0.4023**	**0.2365**	**5.4000e-004**	**0.0000**	**0.0154**	**0.0154**	**0.0000**	**0.0142**	**0.0142**	**0.0000**	**47.3581**	**47.3581**	**0.0153**	**0.0000**	**47.7410**

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	7.3000e-004	5.4000e-004	6.1400e-003	2.0000e-005	1.8300e-003	1.0000e-005	1.8500e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.6837	1.6837	5.0000e-005	0.0000	1.6848
Total	**7.3000e-004**	**5.4000e-004**	**6.1400e-003**	**2.0000e-005**	**1.8300e-003**	**1.0000e-005**	**1.8500e-003**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**1.6837**	**1.6837**	**5.0000e-005**	**0.0000**	**1.6848**

3.4 Grading - 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					
Fugitive Dust					0.3983	0.0000	0.3983	0.2186	0.0000	0.2186	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1206	1.3341	0.6442	1.3600e-003		0.0604	0.0604		0.0556	0.0556	0.0000	119.4856	119.4856	0.0386	0.0000	120.4517
Total	**0.1206**	**1.3341**	**0.6442**	**1.3600e-003**	**0.3983**	**0.0604**	**0.4588**	**0.2186**	**0.0556**	**0.2742**	**0.0000**	**119.4856**	**119.4856**	**0.0386**	**0.0000**	**120.4517**

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	2.1200e-003	0.0738	0.0163	2.1000e-004	4.7400e-003	2.2000e-004	4.9700e-003	1.3000e-003	2.1000e-004	1.5200e-003	0.0000	20.7131	20.7131	1.4900e-003	0.0000	20.7504
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	2.7400e-003	2.0400e-003	0.0230	7.0000e-005	7.2400e-003	5.0000e-005	7.3000e-003	1.9200e-003	5.0000e-005	1.9700e-003	0.0000	6.3139	6.3139	1.7000e-004	0.0000	6.3182
Total	**4.8600e-003**	**0.0759**	**0.0393**	**2.8000e-004**	**0.0120**	**2.7000e-004**	**0.0123**	**3.2200e-003**	**2.6000e-004**	**3.4900e-003**	**0.0000**	**27.0270**	**27.0270**	**1.6600e-003**	**0.0000**	**27.0686**

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					0.1554	0.0000	0.1554	0.0853	0.0000	0.0853	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1206	1.3341	0.6442	1.3600e-003		0.0604	0.0604		0.0556	0.0556	0.0000	119.4855	119.4855	0.0386	0.0000	120.4516

Total	**0.1206**	**1.3341**	**0.6442**	**1.3600e-003**	**0.1554**	**0.0604**	**0.2158**	**0.0853**	**0.0556**	**0.1409**	**0.0000**	**119.4855**	**119.4855**	**0.0386**	**0.0000**	**120.4516**

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	2.1200e-003	0.0738	0.0163	2.1000e-004	4.5300e-003	2.2000e-004	4.7500e-003	1.2500e-003	2.1000e-004	1.4600e-003	0.0000	20.7131	20.7131	1.4900e-003	0.0000	20.7504
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	2.7400e-003	2.0400e-003	0.0230	7.0000e-005	6.8600e-003	5.0000e-005	6.9200e-003	1.8300e-003	5.0000e-005	1.8800e-003	0.0000	6.3139	6.3139	1.7000e-004	0.0000	6.3182
Total	**4.8600e-003**	**0.0759**	**0.0393**	**2.8000e-004**	**0.0114**	**2.7000e-004**	**0.0117**	**3.0800e-003**	**2.6000e-004**	**3.3400e-003**	**0.0000**	**27.0270**	**27.0270**	**1.6600e-003**	**0.0000**	**27.0686**

3.5 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	0.0685	0.5369	0.4879	8.4000e-004		0.0274	0.0274		0.0262	0.0262	0.0000	69.5623	69.5623	0.0137	0.0000	69.9045
Total	**0.0685**	**0.5369**	**0.4879**	**8.4000e-004**		**0.0274**	**0.0274**		**0.0262**	**0.0262**	**0.0000**	**69.5623**	**69.5623**	**0.0137**	**0.0000**	**69.9045**

Unmitigated Construction Off-Site

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					
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	1.0600e-003	0.0358	9.0600e-003	9.0000e-005	2.3200e-003	7.0000e-005	2.4000e-003	6.7000e-004	7.0000e-005	7.4000e-004	0.0000	8.9474	8.9474	5.8000e-004	0.0000	8.9618
Worker	6.4000e-003	4.7500e-003	0.0538	1.6000e-004	0.0169	1.3000e-004	0.0170	4.4900e-003	1.2000e-004	4.6100e-003	0.0000	14.7420	14.7420	4.0000e-004	0.0000	14.7519
Total	**7.4600e-003**	**0.0406**	**0.0628**	**2.5000e-004**	**0.0192**	**2.0000e-004**	**0.0194**	**5.1600e-003**	**1.9000e-004**	**5.3500e-003**	**0.0000**	**23.6894**	**23.6894**	**9.8000e-004**	**0.0000**	**23.7138**

Mitigated Construction On-Site

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					
Off-Road	0.0685	0.5369	0.4879	8.4000e-004		0.0274	0.0274		0.0262	0.0262	0.0000	69.5622	69.5622	0.0137	0.0000	69.9044
Total	**0.0685**	**0.5369**	**0.4879**	**8.4000e-004**		**0.0274**	**0.0274**		**0.0262**	**0.0262**	**0.0000**	**69.5622**	**69.5622**	**0.0137**	**0.0000**	**69.9044**

Mitigated Construction Off-Site

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					

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	1.0600e-003	0.0358	9.0600e-003	9.0000e-005	2.2200e-003	7.0000e-005	2.3000e-003	6.5000e-004	7.0000e-005	7.2000e-004	0.0000	8.9474	8.9474	5.8000e-004	0.0000	8.9618
Worker	6.4000e-003	4.7500e-003	0.0538	1.6000e-004	0.0160	1.3000e-004	0.0162	4.2700e-003	1.2000e-004	4.3900e-003	0.0000	14.7420	14.7420	4.0000e-004	0.0000	14.7519
Total	**7.4600e-003**	**0.0406**	**0.0628**	**2.5000e-004**	**0.0183**	**2.0000e-004**	**0.0185**	**4.9200e-003**	**1.9000e-004**	**5.1100e-003**	**0.0000**	**23.6894**	**23.6894**	**9.8000e-004**	**0.0000**	**23.7138**

3.5 Building Construction - 2022

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	0.1392	1.0953	1.0765	1.8800e-003		0.0527	0.0527		0.0505	0.0505	0.0000	155.7601	155.7601	0.0301	0.0000	156.5113
Total	**0.1392**	**1.0953**	**1.0765**	**1.8800e-003**		**0.0527**	**0.0527**		**0.0505**	**0.0505**	**0.0000**	**155.7601**	**155.7601**	**0.0301**	**0.0000**	**156.5113**

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	2.2300e-003	0.0761	0.0192	2.0000e-004	5.2000e-003	1.4000e-004	5.3400e-003	1.5000e-003	1.4000e-004	1.6400e-003	0.0000	19.8546	19.8546	1.2500e-003	0.0000	19.8858
Worker	0.0135	9.6100e-003	0.1112	3.5000e-004	0.0379	2.8000e-004	0.0381	0.0101	2.6000e-004	0.0103	0.0000	31.8223	31.8223	8.0000e-004	0.0000	31.8424
Total	**0.0157**	**0.0858**	**0.1304**	**5.5000e-004**	**0.0431**	**4.2000e-004**	**0.0435**	**0.0116**	**4.0000e-004**	**0.0120**	**0.0000**	**51.6769**	**51.6769**	**2.0500e-003**	**0.0000**	**51.7282**

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	0.1392	1.0953	1.0765	1.8800e-003		0.0527	0.0527		0.0505	0.0505	0.0000	155.7599	155.7599	0.0301	0.0000	156.5112
Total	**0.1392**	**1.0953**	**1.0765**	**1.8800e-003**		**0.0527**	**0.0527**		**0.0505**	**0.0505**	**0.0000**	**155.7599**	**155.7599**	**0.0301**	**0.0000**	**156.5112**

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	2.2300e-003	0.0761	0.0192	2.0000e-004	4.9800e-003	1.4000e-004	5.1200e-003	1.4500e-003	1.4000e-004	1.5800e-003	0.0000	19.8546	19.8546	1.2500e-003	0.0000	19.8858
Worker	0.0135	9.6100e-003	0.1112	3.5000e-004	0.0359	2.8000e-004	0.0362	9.5700e-003	2.6000e-004	9.8200e-003	0.0000	31.8223	31.8223	8.0000e-004	0.0000	31.8424
Total	**0.0157**	**0.0858**	**0.1304**	**5.5000e-004**	**0.0409**	**4.2000e-004**	**0.0413**	**0.0110**	**4.0000e-004**	**0.0114**	**0.0000**	**51.6769**	**51.6769**	**2.0500e-003**	**0.0000**	**51.7282**

3.6 Paving - 2022

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	0.0207	0.2053	0.2573	3.9000e-004		0.0107	0.0107		9.9000e-003	9.9000e-003	0.0000	34.1221	34.1221	0.0108	0.0000	34.3925
Paving	8.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0208**	**0.2053**	**0.2573**	**3.9000e-004**		**0.0107**	**0.0107**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**34.1221**	**34.1221**	**0.0108**	**0.0000**	**34.3925**

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	1.2900e-003	9.2000e-004	0.0106	3.0000e-005	3.6200e-003	3.0000e-005	3.6500e-003	9.6000e-004	2.0000e-005	9.9000e-004	0.0000	3.0439	3.0439	8.0000e-005	0.0000	3.0458
Total	**1.2900e-003**	**9.2000e-004**	**0.0106**	**3.0000e-005**	**3.6200e-003**	**3.0000e-005**	**3.6500e-003**	**9.6000e-004**	**2.0000e-005**	**9.9000e-004**	**0.0000**	**3.0439**	**3.0439**	**8.0000e-005**	**0.0000**	**3.0458**

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	0.0207	0.2053	0.2573	3.9000e-004		0.0107	0.0107		9.9000e-003	9.9000e-003	0.0000	34.1221	34.1221	0.0108	0.0000	34.3924

Paving	8.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0208**	**0.2053**	**0.2573**	**3.9000e-004**		**0.0107**	**0.0107**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**34.1221**	**34.1221**	**0.0108**	**0.0000**	**34.3924**

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	1.2900e-003	9.2000e-004	0.0106	3.0000e-005	3.4300e-003	3.0000e-005	3.4600e-003	9.2000e-004	2.0000e-005	9.4000e-004	0.0000	3.0439	3.0439	8.0000e-005	0.0000	3.0458
Total	**1.2900e-003**	**9.2000e-004**	**0.0106**	**3.0000e-005**	**3.4300e-003**	**3.0000e-005**	**3.4600e-003**	**9.2000e-004**	**2.0000e-005**	**9.4000e-004**	**0.0000**	**3.0439**	**3.0439**	**8.0000e-005**	**0.0000**	**3.0458**

3.7 Architectural Coating - 2022

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	0.1337					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7500e-003	0.0465	0.0599	1.0000e-004		2.7000e-003	2.7000e-003		2.7000e-003	2.7000e-003	0.0000	8.4257	8.4257	5.5000e-004	0.0000	8.4395
Total	**0.1404**	**0.0465**	**0.0599**	**1.0000e-004**		**2.7000e-003**	**2.7000e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**8.4257**	**8.4257**	**5.5000e-004**	**0.0000**	**8.4395**

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	1.1600e-003	8.3000e-004	9.5700e-003	3.0000e-005	3.2600e-003	2.0000e-005	3.2800e-003	8.7000e-004	2.0000e-005	8.9000e-004	0.0000	2.7395	2.7395	7.0000e-005	0.0000	2.7412
Total	**1.1600e-003**	**8.3000e-004**	**9.5700e-003**	**3.0000e-005**	**3.2600e-003**	**2.0000e-005**	**3.2800e-003**	**8.7000e-004**	**2.0000e-005**	**8.9000e-004**	**0.0000**	**2.7395**	**2.7395**	**7.0000e-005**	**0.0000**	**2.7412**

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	0.1337					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7500e-003	0.0465	0.0599	1.0000e-004		2.7000e-003	2.7000e-003		2.7000e-003	2.7000e-003	0.0000	8.4257	8.4257	5.5000e-004	0.0000	8.4394
Total	**0.1404**	**0.0465**	**0.0599**	**1.0000e-004**		**2.7000e-003**	**2.7000e-003**		**2.7000e-003**	**2.7000e-003**	**0.0000**	**8.4257**	**8.4257**	**5.5000e-004**	**0.0000**	**8.4394**

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	1.1600e-003	8.3000e-004	9.5700e-003	3.0000e-005	3.0900e-003	2.0000e-005	3.1100e-003	8.2000e-004	2.0000e-005	8.5000e-004	0.0000	2.7395	2.7395	7.0000e-005	0.0000	2.7412
Total	**1.1600e-003**	**8.3000e-004**	**9.5700e-003**	**3.0000e-005**	**3.0900e-003**	**2.0000e-005**	**3.1100e-003**	**8.2000e-004**	**2.0000e-005**	**8.5000e-004**	**0.0000**	**2.7395**	**2.7395**	**7.0000e-005**	**0.0000**	**2.7412**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	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	0.0610	0.3199	0.7375	2.6800e-003	0.2232	2.1700e-003	0.2254	0.0598	2.0200e-003	0.0618	0.0000	247.7613	247.7613	0.0123	0.0000	248.0692
Unmitigated	0.0696	0.3824	0.9555	3.6300e-003	0.3084	2.9000e-003	0.3113	0.0826	2.7000e-003	0.0854	0.0000	335.3527	335.3527	0.0159	0.0000	335.7506

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.80	237.80	237.80	812,107	587,683
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	237.80	237.80	237.80	812,107	587,683

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
Condo/Townhouse	14.70	5.90	8.70	40.00	19.00	41.00	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Enclosed Parking with Elevator	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Parking Lot	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	84.2904	84.2904	4.4500e-003	9.2000e-004	84.6762
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	104.2351	104.2351	5.5100e-003	1.1400e-003	104.7122
NaturalGas Mitigated	2.5300e-003	0.0216	9.2100e-003	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	25.0659	25.0659	4.8000e-004	4.6000e-004	25.2148
NaturalGas Unmitigated	3.8000e-003	0.0325	0.0138	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	37.5809	37.5809	7.2000e-004	6.9000e-004	37.8042

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					
Condo/Townhouse	704239	3.8000e-003	0.0325	0.0138	2.1000e-004		2.6200e-003	2.6200e-003		2.6200e-003	2.6200e-003	0.0000	37.5809	37.5809	7.2000e-004	6.9000e-004	37.8042
Enclosed Parking with Elevator	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
Parking Lot	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		**3.8000e-003**	**0.0325**	**0.0138**	**2.1000e-004**		**2.6200e-003**	**2.6200e-003**		**2.6200e-003**	**2.6200e-003**	**0.0000**	**37.5809**	**37.5809**	**7.2000e-004**	**6.9000e-004**	**37.8042**

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					
Condo/Townhouse	469717	2.5300e-003	0.0216	9.2100e-003	1.4000e-004		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	25.0659	25.0659	4.8000e-004	4.6000e-004	25.2148
Enclosed Parking with Elevator	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
Parking Lot	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		**2.5300e-003**	**0.0216**	**9.2100e-003**	**1.4000e-004**		**1.7500e-003**	**1.7500e-003**		**1.7500e-003**	**1.7500e-003**	**0.0000**	**25.0659**	**25.0659**	**4.8000e-004**	**4.6000e-004**	**25.2148**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	206638	51.4573	2.7200e-003	5.6000e-004	51.6929
Enclosed Parking with Elevator	210960	52.5337	2.7800e-003	5.7000e-004	52.7742
Parking Lot	980	0.2440	1.0000e-005	0.0000	0.2452
Total		**104.2351**	**5.5100e-003**	**1.1300e-003**	**104.7122**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	201339	50.1379	2.6500e-003	5.5000e-004	50.3674
Enclosed Parking with Elevator	136166	33.9085	1.7900e-003	3.7000e-004	34.0637
Parking Lot	980	0.2440	1.0000e-005	0.0000	0.2452
Total		**84.2904**	**4.4500e-003**	**9.2000e-004**	**84.6762**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	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	0.1769	4.8900e-003	0.4238	2.0000e-005		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	0.6917	0.6917	6.7000e-004	0.0000	0.7085
Unmitigated	0.1777	0.0121	0.4269	7.0000e-005		2.9200e-003	2.9200e-003		2.9200e-003	2.9200e-003	0.0000	9.0605	9.0605	8.3000e-004	1.5000e-004	9.1270

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	0.0134					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	8.5000e-004	7.2300e-003	3.0800e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3688	8.3688	1.6000e-004	1.5000e-004	8.4185
Landscaping	0.0128	4.8900e-003	0.4238	2.0000e-005		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	0.6917	0.6917	6.7000e-004	0.0000	0.7085
Total	**0.1777**	**0.0121**	**0.4269**	**7.0000e-005**		**2.9200e-003**	**2.9200e-003**		**2.9200e-003**	**2.9200e-003**	**0.0000**	**9.0605**	**9.0605**	**8.3000e-004**	**1.5000e-004**	**9.1270**

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	0.0134					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1507					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0128	4.8900e-003	0.4238	2.0000e-005		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	0.6917	0.6917	6.7000e-004	0.0000	0.7085
Total	**0.1769**	**4.8900e-003**	**0.4238**	**2.0000e-005**		**2.3400e-003**	**2.3400e-003**		**2.3400e-003**	**2.3400e-003**	**0.0000**	**0.6917**	**0.6917**	**6.7000e-004**	**0.0000**	**0.7085**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	12.2667	0.0703	1.7700e-003	14.5506
Unmitigated	14.1685	0.0878	2.2000e-003	17.0181

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.67132 / 1.68409	14.1685	0.0878	2.2000e-003	17.0181
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**14.1685**	**0.0878**	**2.2000e-003**	**17.0181**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.13705 / 1.68409	12.2667	0.0703	1.7700e-003	14.5506
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**12.2667**	**0.0703**	**1.7700e-003**	**14.5506**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.9571	0.0566	0.0000	2.3712
Unmitigated	3.8284	0.2263	0.0000	9.4847

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	18.86	3.8284	0.2263	0.0000	9.4847
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**3.8284**	**0.2263**	**0.0000**	**9.4847**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Land Use	tons	MT/yr			
Condo/Townhouse	4.715	0.9571	0.0566	0.0000	2.3712
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.9571**	**0.0566**	**0.0000**	**2.3712**

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

Arroyo Village Residential Condominium Project

South Coast Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	36.00	1000sqft	0.83	36,000.00	0
Parking Lot	7.00	Space	0.06	2,800.00	0
Condo/Townhouse	41.00	Dwelling Unit	1.12	41,000.00	117

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	549	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Per SCE 2017 Sustainability Report (pg 10).

Land Use - Lot Size

Construction Phase - Anticipated Construction Schedule

Off-road Equipment -

Off-road Equipment - .

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - .

Demolition -

Grading - Lot Size is 1.16 with 4,416 cy of soil to be exported..

Vehicle Trips - Project is anticipated to generate approximately 238 daily trips.

Woodstoves - No Woodstoves/Fireplaces

Energy Use -

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation - 2019 Title 24 (P/V)

Water Mitigation -

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	3.00	44.00
tblConstructionPhase	NumDays	6.00	132.00
tblConstructionPhase	NumDays	220.00	217.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	10.00	66.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblGrading	AcresOfGrading	66.00	1.16
tblGrading	AcresOfGrading	66.00	0.00
tblGrading	MaterialExported	0.00	4,417.00
tblLandUse	LotAcreage	2.56	1.12
tblProjectCharacteristics	CO2IntensityFactor	702.44	549
tblVehicleTrips	HO_TTP	40.60	41.00
tblVehicleTrips	HS_TTP	19.20	19.00

tblVehicleTrips	HW_TTP	40.20	40.00
tblVehicleTrips	ST_TR	5.67	5.80
tblVehicleTrips	SU_TR	4.84	5.80
tblVehicleTrips	WD_TR	5.81	5.80
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

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					
2021	4.1692	39.6331	26.9213	0.0578	6.8046	1.7432	8.5477	3.5181	1.6351	5.1532	0.0000	5,550.6838	5,550.6838	1.4428	0.0000	5,579.5694
2022	5.2941	25.0872	28.4105	0.0522	0.7522	1.1968	1.9490	0.2011	1.1294	1.3305	0.0000	4,945.2083	4,945.2083	1.0178	0.0000	4,970.6522
Maximum	**5.2941**	**39.6331**	**28.4105**	**0.0578**	**6.8046**	**1.7432**	**8.5477**	**3.5181**	**1.6351**	**5.1532**	**0.0000**	**5,550.6838**	**5,550.6838**	**1.4428**	**0.0000**	**5,579.5694**

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					
2021	4.1692	39.6331	26.9213	0.0578	3.0841	1.7432	4.8273	1.4883	1.6351	3.1234	0.0000	5,550.6838	5,550.6838	1.4428	0.0000	5,579.5694
2022	5.2941	25.0872	28.4105	0.0522	0.7137	1.1968	1.9105	0.1916	1.1294	1.3210	0.0000	4,945.2083	4,945.2083	1.0178	0.0000	4,970.6522

Maximum	5.2941	39.6331	28.4105	0.0578	3.0841	1.7432	4.8273	1.4883	1.6351	3.1234	0.0000	5,550.6838	5,550.6838	1.4428	0.0000	5,579.5694

	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	49.74	0.00	35.81	54.83	0.00	31.45	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	1.0691	0.6172	3.6366	3.8700e-003		0.0655	0.0655		0.0655	0.0655	0.0000	744.1001	744.1001	0.0201	0.0135	748.6331
Energy	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397
Mobile	0.4083	2.0186	5.5092	0.0208	1.7260	0.0159	1.7420	0.4618	0.0148	0.4766		2,111.5749	2,111.5749	0.0971		2,114.0033
Total	**1.4982**	**2.8136**	**9.2215**	**0.0258**	**1.7260**	**0.0958**	**1.8218**	**0.4618**	**0.0947**	**0.5565**	**0.0000**	**3,082.6658**	**3,082.6658**	**0.1215**	**0.0177**	**3,090.9761**

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	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476
Energy	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
Mobile	0.3600	1.7002	4.2059	0.0153	1.2491	0.0119	1.2610	0.3342	0.0111	0.3453		1,560.1287	1,560.1287	0.0748		1,561.9986

Total	1.3753	1.8579	7.6470	0.0163	1.2491	0.0402	1.2893	0.3342	0.0394	0.3736	0.0000	1,717.628 1	1,717.6281	0.0836	2.7800e-003	1,720.545 3

	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	8.20	33.97	17.07	36.85	27.63	58.01	29.23	27.63	58.38	32.87	0.00	44.28	44.28	31.21	84.28	44.34

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	1/28/2021	5	20	
2	Site Preparation	Site Preparation	1/29/2021	3/31/2021	5	44	
3	Grading	Grading	3/31/2021	9/30/2021	5	132	
4	Building Construction	Building Construction	9/30/2021	7/29/2022	5	217	
5	Paving	Paving	7/29/2022	9/28/2022	5	44	
6	Architectural Coating	Architectural Coating	9/28/2022	12/28/2022	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.16

Acres of Paving: 0.89

Residential Indoor: 83,025; Residential Outdoor: 27,675; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	5	13.00	0.00	25.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	552.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	46.00	11.00	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	9.00	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

Clean Paved Roads

3.2 Demolition - 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					
Fugitive Dust					0.2676	0.0000	0.2676	0.0405	0.0000	0.0405			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.2676**	**1.0409**	**1.3085**	**0.0405**	**0.9715**	**1.0120**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	9.5000e-003	0.3241	0.0716	9.6000e-004	0.0218	1.0100e-003	0.0228	5.9800e-003	9.7000e-004	6.9500e-003		104.1579	104.1579	7.3400e-003		104.3415
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	0.0544	0.0355	0.4881	1.4400e-003	0.1453	1.0800e-003	0.1464	0.0385	9.9000e-004	0.0395		143.8968	143.8968	3.8800e-003		143.9937
Total	**0.0639**	**0.3596**	**0.5597**	**2.4000e-003**	**0.1671**	**2.0900e-003**	**0.1692**	**0.0445**	**1.9600e-003**	**0.0465**		**248.0547**	**248.0547**	**0.0112**		**248.3352**

Mitigated Construction On-Site

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
	lb/day										lb/day					
Fugitive Dust					0.1043	0.0000	0.1043	0.0158	0.0000	0.0158			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.1043**	**1.0409**	**1.1452**	**0.0158**	**0.9715**	**0.9873**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

Mitigated Construction Off-Site

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
	lb/day										lb/day					
Hauling	9.5000e-003	0.3241	0.0716	9.6000e-004	0.0208	1.0100e-003	0.0219	5.7400e-003	9.7000e-004	6.7100e-003		104.1579	104.1579	7.3400e-003		104.3415
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	0.0544	0.0355	0.4881	1.4400e-003	0.1377	1.0800e-003	0.1388	0.0367	9.9000e-004	0.0377		143.8968	143.8968	3.8800e-003		143.9937
Total	**0.0639**	**0.3596**	**0.5597**	**2.4000e-003**	**0.1586**	**2.0900e-003**	**0.1607**	**0.0424**	**1.9600e-003**	**0.0444**		**248.0547**	**248.0547**	**0.0112**		**248.3352**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

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
	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000

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
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.0000**	**0.7019**	**0.7019**	**0.0000**	**0.6457**	**0.6457**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0335	0.0218	0.3004	8.9000e-004	0.0894	6.6000e-004	0.0901	0.0237	6.1000e-004	0.0243		88.5519	88.5519	2.3900e-003		88.6115
Total	**0.0335**	**0.0218**	**0.3004**	**8.9000e-004**	**0.0894**	**6.6000e-004**	**0.0901**	**0.0237**	**6.1000e-004**	**0.0243**		**88.5519**	**88.5519**	**2.3900e-003**		**88.6115**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.0000**	**0.7019**	**0.7019**	**0.0000**	**0.6457**	**0.6457**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0335	0.0218	0.3004	8.9000e-004	0.0848	6.6000e-004	0.0854	0.0226	6.1000e-004	0.0232		88.5519	88.5519	2.3900e-003		88.6115
Total	**0.0335**	**0.0218**	**0.3004**	**8.9000e-004**	**0.0848**	**6.6000e-004**	**0.0854**	**0.0226**	**6.1000e-004**	**0.0232**		**88.5519**	**88.5519**	**2.3900e-003**		**88.6115**

3.4 Grading - 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					
Fugitive Dust					6.0352	0.0000	6.0352	3.3118	0.0000	3.3118			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.0352**	**0.9158**	**6.9509**	**3.3118**	**0.8425**	**4.1543**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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					

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
Hauling	0.0318	1.0843	0.2395	3.2100e-003	0.0730	3.3800e-003	0.0764	0.0200	3.2300e-003	0.0233		348.4557	348.4557	0.0246		349.0696
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	0.0419	0.0273	0.3755	1.1100e-003	0.1118	8.3000e-004	0.1126	0.0296	7.6000e-004	0.0304		110.6898	110.6898	2.9800e-003		110.7644
Total	**0.0736**	**1.1116**	**0.6150**	**4.3200e-003**	**0.1848**	**4.2100e-003**	**0.1890**	**0.0497**	**3.9900e-003**	**0.0537**		**459.1455**	**459.1455**	**0.0275**		**459.8340**

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					2.3537	0.0000	2.3537	1.2916	0.0000	1.2916			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.3537**	**0.9158**	**3.2695**	**1.2916**	**0.8425**	**2.1341**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0318	1.0843	0.2395	3.2100e-003	0.0697	3.3800e-003	0.0731	0.0192	3.2300e-003	0.0224		348.4557	348.4557	0.0246		349.0696
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	0.0419	0.0273	0.3755	1.1100e-003	0.1060	8.3000e-004	0.1068	0.0282	7.6000e-004	0.0290		110.6898	110.6898	2.9800e-003		110.7644
Total	**0.0736**	**1.1116**	**0.6150**	**4.3200e-003**	**0.1757**	**4.2100e-003**	**0.1799**	**0.0474**	**3.9900e-003**	**0.0514**		**459.1455**	**459.1455**	**0.0275**		**459.8340**

3.5 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	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831		2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**		**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

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	0.0310	1.0534	0.2558	2.7800e-003	0.0704	2.1500e-003	0.0725	0.0203	2.0600e-003	0.0223		297.8181	297.8181	0.0184		298.2785
Worker	0.1925	0.1256	1.7272	5.1100e-003	0.5142	3.8100e-003	0.5180	0.1364	3.5000e-003	0.1399		509.1732	509.1732	0.0137		509.5163
Total	**0.2235**	**1.1790**	**1.9830**	**7.8900e-003**	**0.5846**	**5.9600e-003**	**0.5905**	**0.1566**	**5.5600e-003**	**0.1622**		**806.9913**	**806.9913**	**0.0321**		**807.7948**

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	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831	0.0000	2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**	**0.0000**	**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

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	0.0310	1.0534	0.2558	2.7800e-003	0.0674	2.1500e-003	0.0695	0.0195	2.0600e-003	0.0216		297.8181	297.8181	0.0184		298.2785
Worker	0.1925	0.1256	1.7272	5.1100e-003	0.4874	3.8100e-003	0.4912	0.1298	3.5000e-003	0.1333		509.1732	509.1732	0.0137		509.5163
Total	**0.2235**	**1.1790**	**1.9830**	**7.8900e-003**	**0.5547**	**5.9600e-003**	**0.5607**	**0.1493**	**5.5600e-003**	**0.1549**		**806.9913**	**806.9913**	**0.0321**		**807.7948**

3.5 Building Construction - 2022

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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230

Total	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.281 3	2,289.2813	0.4417		2,300.323 0

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	0.0290	1.0006	0.2422	2.7600e-003	0.0704	1.8700e-003	0.0723	0.0203	1.7900e-003	0.0221		295.2073	295.2073	0.0178		295.6518
Worker	0.1806	0.1134	1.5972	4.9300e-003	0.5142	3.7000e-003	0.5179	0.1364	3.4000e-003	0.1398		490.9411	490.9411	0.0124		491.2512
Total	**0.2096**	**1.1140**	**1.8394**	**7.6900e-003**	**0.5846**	**5.5700e-003**	**0.5901**	**0.1566**	**5.1900e-003**	**0.1618**		**786.1483**	**786.1483**	**0.0302**		**786.9031**

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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.281 3	2,289.2813	0.4417		2,300.323 0
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.281 3**	**2,289.2813**	**0.4417**		**2,300.323 0**

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	0.0290	1.0006	0.2422	2.7600e-003	0.0674	1.8700e-003	0.0693	0.0195	1.7900e-003	0.0213		295.2073	295.2073	0.0178		295.6518
Worker	0.1806	0.1134	1.5972	4.9300e-003	0.4874	3.7000e-003	0.4911	0.1298	3.4000e-003	0.1332		490.9411	490.9411	0.0124		491.2512
Total	**0.2096**	**1.1140**	**1.8394**	**7.6900e-003**	**0.5547**	**5.5700e-003**	**0.5603**	**0.1493**	**5.1900e-003**	**0.1545**		**786.1483**	**786.1483**	**0.0302**		**786.9031**

3.6 Paving - 2022

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	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	3.5700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9447**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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					

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
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	0.0589	0.0370	0.5208	1.6100e-003	0.1677	1.2100e-003	0.1689	0.0445	1.1100e-003	0.0456		160.0895	160.0895	4.0500e-003		160.1906
Total	**0.0589**	**0.0370**	**0.5208**	**1.6100e-003**	**0.1677**	**1.2100e-003**	**0.1689**	**0.0445**	**1.1100e-003**	**0.0456**		**160.0895**	**160.0895**	**4.0500e-003**		**160.1906**

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	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	3.5700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9447**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0589	0.0370	0.5208	1.6100e-003	0.1589	1.2100e-003	0.1601	0.0423	1.1100e-003	0.0434		160.0895	160.0895	4.0500e-003		160.1906
Total	**0.0589**	**0.0370**	**0.5208**	**1.6100e-003**	**0.1589**	**1.2100e-003**	**0.1601**	**0.0423**	**1.1100e-003**	**0.0434**		**160.0895**	**160.0895**	**4.0500e-003**		**160.1906**

3.7 Architectural Coating - 2022

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	4.0506					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**4.2551**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0353	0.0222	0.3125	9.6000e-004	0.1006	7.2000e-004	0.1013	0.0267	6.7000e-004	0.0274		96.0537	96.0537	2.4300e-003		96.1144
Total	**0.0353**	**0.0222**	**0.3125**	**9.6000e-004**	**0.1006**	**7.2000e-004**	**0.1013**	**0.0267**	**6.7000e-004**	**0.0274**		**96.0537**	**96.0537**	**2.4300e-003**		**96.1144**

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	4.0506					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**4.2551**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0353	0.0222	0.3125	9.6000e-004	0.0954	7.2000e-004	0.0961	0.0254	6.7000e-004	0.0261		96.0537	96.0537	2.4300e-003		96.1144
Total	**0.0353**	**0.0222**	**0.3125**	**9.6000e-004**	**0.0954**	**7.2000e-004**	**0.0961**	**0.0254**	**6.7000e-004**	**0.0261**		**96.0537**	**96.0537**	**2.4300e-003**		**96.1144**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	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	0.3600	1.7002	4.2059	0.0153	1.2491	0.0119	1.2610	0.3342	0.0111	0.3453		1,560.1287	1,560.1287	0.0748		1,561.9986
Unmitigated	0.4083	2.0186	5.5092	0.0208	1.7260	0.0159	1.7420	0.4618	0.0148	0.4766		2,111.5749	2,111.5749	0.0971		2,114.0033

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.80	237.80	237.80	812,107	587,683
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	237.80	237.80	237.80	812,107	587,683

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
Condo/Townhouse	14.70	5.90	8.70	40.00	19.00	41.00	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Enclosed Parking with Elevator	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Parking Lot	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
NaturalGas Unmitigated	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397

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					
Condo/Townhouse	1929.42	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397
Enclosed Parking with Elevator	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
Parking Lot	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		**0.0208**	**0.1778**	**0.0757**	**1.1300e-003**		**0.0144**	**0.0144**		**0.0144**	**0.0144**		**226.9908**	**226.9908**	**4.3500e-003**	**4.1600e-003**	**228.3397**

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					
Condo/Townhouse	1.28689	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
Enclosed Parking with Elevator	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
Parking Lot	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		**0.0139**	**0.1186**	**0.0505**	**7.6000e-004**		**9.5900e-003**	**9.5900e-003**		**9.5900e-003**	**9.5900e-003**		**151.3994**	**151.3994**	**2.9000e-003**	**2.7800e-003**	**152.2991**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	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	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476

	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
Unmitigated	1.0691	0.6172	3.6366	3.8700e-003		0.0655	0.0655		0.0655	0.0655	0.0000	744.1001	744.1001	0.0201	0.0135	748.6331

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	0.0732					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8255					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0677	0.5781	0.2460	3.6900e-003		0.0467	0.0467		0.0467	0.0467	0.0000	738.0000	738.0000	0.0141	0.0135	742.3856
Landscaping	0.1027	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187		6.1001	6.1001	5.9000e-003		6.2476
Total	**1.0691**	**0.6172**	**3.6366**	**3.8700e-003**		**0.0655**	**0.0655**		**0.0655**	**0.0655**	**0.0000**	**744.1001**	**744.1001**	**0.0200**	**0.0135**	**748.6331**

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	0.0732					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8255					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.1027	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187		6.1001	6.1001	5.9000e-003		6.2476

Total	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

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

Arroyo Village Residential Condominium Project

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	36.00	1000sqft	0.83	36,000.00	0
Parking Lot	7.00	Space	0.06	2,800.00	0
Condo/Townhouse	41.00	Dwelling Unit	1.12	41,000.00	117

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	9			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	549	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Per SCE 2017 Sustainability Report (pg 10).

Land Use - Lot Size

Construction Phase - Anticipated Construction Schedule

Off-road Equipment -

Off-road Equipment - .

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - .

Demolition -

Grading - Lot Size is 1.16 with 4,416 cy of soil to be exported..

Vehicle Trips - Project is anticipated to generate approximately 238 daily trips.

Woodstoves - No Woodstoves/Fireplaces

Energy Use -

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation - 2019 Title 24 (P/V)

Water Mitigation -

Waste Mitigation - AB 341

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	3.00	44.00
tblConstructionPhase	NumDays	6.00	132.00
tblConstructionPhase	NumDays	220.00	217.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	10.00	66.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblGrading	AcresOfGrading	66.00	1.16
tblGrading	AcresOfGrading	66.00	0.00
tblGrading	MaterialExported	0.00	4,417.00
tblLandUse	LotAcreage	2.56	1.12
tblProjectCharacteristics	CO2IntensityFactor	702.44	549
tblVehicleTrips	HO_TTP	40.60	41.00
tblVehicleTrips	HS_TTP	19.20	19.00

tblVehicleTrips	HW_TTP	40.20	40.00
tblVehicleTrips	ST_TR	5.67	5.80
tblVehicleTrips	SU_TR	4.84	5.80
tblVehicleTrips	WD_TR	5.81	5.80
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

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					
2021	4.1955	39.6513	26.7661	0.0573	6.8046	1.7433	8.5479	3.5181	1.6353	5.1533	0.0000	5,498.0955	5,498.0955	1.4434	0.0000	5,527.0089
2022	5.3039	25.0989	28.2334	0.0517	0.7522	1.1969	1.9491	0.2011	1.1294	1.3305	0.0000	4,896.6919	4,896.6919	1.0179	0.0000	4,922.1394
Maximum	**5.3039**	**39.6513**	**28.2334**	**0.0573**	**6.8046**	**1.7433**	**8.5479**	**3.5181**	**1.6353**	**5.1533**	**0.0000**	**5,498.0955**	**5,498.0955**	**1.4434**	**0.0000**	**5,527.0089**

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					
2021	4.1955	39.6513	26.7661	0.0573	3.0841	1.7433	4.8274	1.4883	1.6353	3.1236	0.0000	5,498.0955	5,498.0955	1.4434	0.0000	5,527.0089
2022	5.3039	25.0989	28.2334	0.0517	0.7137	1.1969	1.9105	0.1916	1.1294	1.3210	0.0000	4,896.6919	4,896.6919	1.0179	0.0000	4,922.1394

	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
Maximum	**5.3039**	**39.6513**	**28.2334**	**0.0573**	**3.0841**	**1.7433**	**4.8274**	**1.4883**	**1.6353**	**3.1236**	**0.0000**	**5,498.0955**	**5,498.0955**	**1.4434**	**0.0000**	**5,527.0089**

	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**	**49.74**	**0.00**	**35.81**	**54.83**	**0.00**	**31.45**	**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	1.0691	0.6172	3.6366	3.8700e-003		0.0655	0.0655		0.0655	0.0655	0.0000	744.1001	744.1001	0.0201	0.0135	748.6331
Energy	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397
Mobile	0.3919	2.0628	5.1713	0.0197	1.7260	0.0160	1.7420	0.4618	0.0149	0.4767		2,004.4229	2,004.4229	0.0969		2,006.8461
Total	**1.4819**	**2.8578**	**8.8835**	**0.0247**	**1.7260**	**0.0959**	**1.8219**	**0.4618**	**0.0948**	**0.5565**	**0.0000**	**2,975.5138**	**2,975.5138**	**0.1213**	**0.0177**	**2,983.8189**

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	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476
Energy	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
Mobile	0.3450	1.7265	4.0053	0.0145	1.2491	0.0120	1.2610	0.3342	0.0112	0.3453		1,479.5818	1,479.5818	0.0752		1,481.4628

Total	1.3603	1.8842	7.4463	0.0155	1.2491	0.0403	1.2894	0.3342	0.0395	0.3737	0.0000	1,637.081 3	1,637.0813	0.0840	2.7800e-003	1,640.009 5

	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	8.20	34.07	16.18	37.36	27.63	57.97	29.23	27.63	58.33	32.86	0.00	44.98	44.98	30.73	84.28	45.04

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2021	1/28/2021	5	20	
2	Site Preparation	Site Preparation	1/29/2021	3/31/2021	5	44	
3	Grading	Grading	3/31/2021	9/30/2021	5	132	
4	Building Construction	Building Construction	9/30/2021	7/29/2022	5	217	
5	Paving	Paving	7/29/2022	9/28/2022	5	44	
6	Architectural Coating	Architectural Coating	9/28/2022	12/28/2022	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.16

Acres of Paving: 0.89

Residential Indoor: 83,025; Residential Outdoor: 27,675; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	5	13.00	0.00	25.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	552.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	46.00	11.00	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	9.00	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

Clean Paved Roads

3.2 Demolition - 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					
Fugitive Dust					0.2676	0.0000	0.2676	0.0405	0.0000	0.0405			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715		2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.2676**	**1.0409**	**1.3085**	**0.0405**	**0.9715**	**1.0120**		**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

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	9.7500e-003	0.3281	0.0763	9.4000e-004	0.0218	1.0300e-003	0.0229	5.9800e-003	9.8000e-004	6.9600e-003		102.3696	102.3696	7.6200e-003		102.5599
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	0.0600	0.0390	0.4418	1.3500e-003	0.1453	1.0800e-003	0.1464	0.0385	9.9000e-004	0.0395		134.9597	134.9597	3.6300e-003		135.0504
Total	**0.0697**	**0.3671**	**0.5181**	**2.2900e-003**	**0.1671**	**2.1100e-003**	**0.1692**	**0.0445**	**1.9700e-003**	**0.0465**		**237.3292**	**237.3292**	**0.0113**		**237.6103**

Mitigated Construction On-Site

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
	lb/day										lb/day					
Fugitive Dust					0.1043	0.0000	0.1043	0.0158	0.0000	0.0158			0.0000			0.0000
Off-Road	1.9930	19.6966	14.4925	0.0241		1.0409	1.0409		0.9715	0.9715	0.0000	2,322.7171	2,322.7171	0.5940		2,337.5658
Total	**1.9930**	**19.6966**	**14.4925**	**0.0241**	**0.1043**	**1.0409**	**1.1452**	**0.0158**	**0.9715**	**0.9873**	**0.0000**	**2,322.7171**	**2,322.7171**	**0.5940**		**2,337.5658**

Mitigated Construction Off-Site

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
	lb/day										lb/day					
Hauling	9.7500e-003	0.3281	0.0763	9.4000e-004	0.0208	1.0300e-003	0.0219	5.7400e-003	9.8000e-004	6.7200e-003		102.3696	102.3696	7.6200e-003		102.5599
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	0.0600	0.0390	0.4418	1.3500e-003	0.1377	1.0800e-003	0.1388	0.0367	9.9000e-004	0.0377		134.9597	134.9597	3.6300e-003		135.0504
Total	**0.0697**	**0.3671**	**0.5181**	**2.2900e-003**	**0.1586**	**2.1100e-003**	**0.1607**	**0.0424**	**1.9700e-003**	**0.0444**		**237.3292**	**237.3292**	**0.0113**		**237.6103**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

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
	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000

Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457		2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.0000**	**0.7019**	**0.7019**	**0.0000**	**0.6457**	**0.6457**		**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

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	0.0369	0.0240	0.2719	8.3000e-004	0.0894	6.6000e-004	0.0901	0.0237	6.1000e-004	0.0243		83.0521	83.0521	2.2300e-003		83.1079
Total	**0.0369**	**0.0240**	**0.2719**	**8.3000e-004**	**0.0894**	**6.6000e-004**	**0.0901**	**0.0237**	**6.1000e-004**	**0.0243**		**83.0521**	**83.0521**	**2.2300e-003**		**83.1079**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.5463	18.2862	10.7496	0.0245		0.7019	0.7019		0.6457	0.6457	0.0000	2,372.8832	2,372.8832	0.7674		2,392.0692
Total	**1.5463**	**18.2862**	**10.7496**	**0.0245**	**0.0000**	**0.7019**	**0.7019**	**0.0000**	**0.6457**	**0.6457**	**0.0000**	**2,372.8832**	**2,372.8832**	**0.7674**		**2,392.0692**

Mitigated Construction Off-Site

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
	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	0.0369	0.0240	0.2719	8.3000e-004	0.0848	6.6000e-004	0.0854	0.0226	6.1000e-004	0.0232		83.0521	83.0521	2.2300e-003		83.1079
Total	**0.0369**	**0.0240**	**0.2719**	**8.3000e-004**	**0.0848**	**6.6000e-004**	**0.0854**	**0.0226**	**6.1000e-004**	**0.0232**		**83.0521**	**83.0521**	**2.2300e-003**		**83.1079**

3.4 Grading - 2021

Unmitigated Construction On-Site

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
	lb/day										lb/day					
Fugitive Dust					6.0352	0.0000	6.0352	3.3118	0.0000	3.3118			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425		1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**6.0352**	**0.9158**	**6.9509**	**3.3118**	**0.8425**	**4.1543**		**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

Unmitigated Construction Off-Site

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
	lb/day										lb/day					

Hauling	0.0326	1.0976	0.2552	3.1500e-003	0.0730	3.4300e-003	0.0765	0.0200	3.2800e-003	0.0233		342.4727	342.4727	0.0255		343.1096
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	0.0461	0.0300	0.3399	1.0400e-003	0.1118	8.3000e-004	0.1126	0.0296	7.6000e-004	0.0304		103.8151	103.8151	2.7900e-003		103.8849
Total	**0.0787**	**1.1276**	**0.5950**	**4.1900e-003**	**0.1848**	**4.2600e-003**	**0.1891**	**0.0497**	**4.0400e-003**	**0.0537**		**446.2878**	**446.2878**	**0.0283**		**446.9946**

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					2.3537	0.0000	2.3537	1.2916	0.0000	1.2916			0.0000			0.0000
Off-Road	1.8271	20.2135	9.7604	0.0206		0.9158	0.9158		0.8425	0.8425	0.0000	1,995.6114	1,995.6114	0.6454		2,011.7470
Total	**1.8271**	**20.2135**	**9.7604**	**0.0206**	**2.3537**	**0.9158**	**3.2695**	**1.2916**	**0.8425**	**2.1341**	**0.0000**	**1,995.6114**	**1,995.6114**	**0.6454**		**2,011.7470**

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	0.0326	1.0976	0.2552	3.1500e-003	0.0697	3.4300e-003	0.0732	0.0192	3.2800e-003	0.0225		342.4727	342.4727	0.0255		343.1096
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	0.0461	0.0300	0.3399	1.0400e-003	0.1060	8.3000e-004	0.1068	0.0282	7.6000e-004	0.0290		103.8151	103.8151	2.7900e-003		103.8849
Total	**0.0787**	**1.1276**	**0.5950**	**4.1900e-003**	**0.1757**	**4.2600e-003**	**0.1799**	**0.0474**	**4.0400e-003**	**0.0515**		**446.2878**	**446.2878**	**0.0283**		**446.9946**

3.5 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	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831		2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**		**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

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	0.0325	1.0510	0.2843	2.7100e-003	0.0704	2.2200e-003	0.0726	0.0203	2.1200e-003	0.0224		289.7112	289.7112	0.0197		290.2032
Worker	0.2121	0.1379	1.5634	4.7900e-003	0.5142	3.8100e-003	0.5180	0.1364	3.5000e-003	0.1399		477.5495	477.5495	0.0128		477.8706
Total	**0.2447**	**1.1889**	**1.8477**	**7.5000e-003**	**0.5846**	**6.0300e-003**	**0.5906**	**0.1566**	**5.6200e-003**	**0.1623**		**767.2607**	**767.2607**	**0.0325**		**768.0738**

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	2.0451	16.0275	14.5629	0.0250		0.8173	0.8173		0.7831	0.7831	0.0000	2,288.9355	2,288.9355	0.4503		2,300.1935
Total	**2.0451**	**16.0275**	**14.5629**	**0.0250**		**0.8173**	**0.8173**		**0.7831**	**0.7831**	**0.0000**	**2,288.9355**	**2,288.9355**	**0.4503**		**2,300.1935**

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	0.0325	1.0510	0.2843	2.7100e-003	0.0674	2.2200e-003	0.0696	0.0195	2.1200e-003	0.0217		289.7112	289.7112	0.0197		290.2032
Worker	0.2121	0.1379	1.5634	4.7900e-003	0.4874	3.8100e-003	0.4912	0.1298	3.5000e-003	0.1333		477.5495	477.5495	0.0128		477.8706
Total	**0.2447**	**1.1889**	**1.8477**	**7.5000e-003**	**0.5547**	**6.0300e-003**	**0.5608**	**0.1493**	**5.6200e-003**	**0.1549**		**767.2607**	**767.2607**	**0.0325**		**768.0738**

3.5 Building Construction - 2022

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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230

Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**		**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

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	0.0305	0.9975	0.2693	2.6800e-003	0.0704	1.9300e-003	0.0723	0.0203	1.8500e-003	0.0221		287.1243	287.1243	0.0190		287.5991
Worker	0.1995	0.1246	1.4432	4.6200e-003	0.5142	3.7000e-003	0.5179	0.1364	3.4000e-003	0.1398		460.4503	460.4503	0.0116		460.7403
Total	**0.2300**	**1.1221**	**1.7125**	**7.3000e-003**	**0.5846**	**5.6300e-003**	**0.5902**	**0.1566**	**5.2500e-003**	**0.1619**		**747.5746**	**747.5746**	**0.0306**		**748.3394**

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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

Mitigated Construction Off-Site

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
	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	0.0305	0.9975	0.2693	2.6800e-003	0.0674	1.9300e-003	0.0693	0.0195	1.8500e-003	0.0214		287.1243	287.1243	0.0190		287.5991
Worker	0.1995	0.1246	1.4432	4.6200e-003	0.4874	3.7000e-003	0.4911	0.1298	3.4000e-003	0.1332		460.4503	460.4503	0.0116		460.7403
Total	**0.2300**	**1.1221**	**1.7125**	**7.3000e-003**	**0.5547**	**5.6300e-003**	**0.5604**	**0.1493**	**5.2500e-003**	**0.1546**		**747.5746**	**747.5746**	**0.0306**		**748.3394**

3.6 Paving - 2022

Unmitigated Construction On-Site

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
	lb/day										lb/day					
Off-Road	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500		1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	3.5700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9447**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**		**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

Unmitigated Construction Off-Site

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
	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	0.0651	0.0406	0.4706	1.5100e-003	0.1677	1.2100e-003	0.1689	0.0445	1.1100e-003	0.0456		150.1468	150.1468	3.7800e-003		150.2414
Total	**0.0651**	**0.0406**	**0.4706**	**1.5100e-003**	**0.1677**	**1.2100e-003**	**0.1689**	**0.0445**	**1.1100e-003**	**0.0456**		**150.1468**	**150.1468**	**3.7800e-003**		**150.2414**

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	0.9412	9.3322	11.6970	0.0179		0.4879	0.4879		0.4500	0.4500	0.0000	1,709.6892	1,709.6892	0.5419		1,723.2356
Paving	3.5700e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9447**	**9.3322**	**11.6970**	**0.0179**		**0.4879**	**0.4879**		**0.4500**	**0.4500**	**0.0000**	**1,709.6892**	**1,709.6892**	**0.5419**		**1,723.2356**

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	0.0651	0.0406	0.4706	1.5100e-003	0.1589	1.2100e-003	0.1601	0.0423	1.1100e-003	0.0434		150.1468	150.1468	3.7800e-003		150.2414
Total	**0.0651**	**0.0406**	**0.4706**	**1.5100e-003**	**0.1589**	**1.2100e-003**	**0.1601**	**0.0423**	**1.1100e-003**	**0.0434**		**150.1468**	**150.1468**	**3.7800e-003**		**150.2414**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

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
	lb/day										lb/day					
Archit. Coating	4.0506					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**4.2551**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

Unmitigated Construction Off-Site

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
	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	0.0390	0.0244	0.2824	9.0000e-004	0.1006	7.2000e-004	0.1013	0.0267	6.7000e-004	0.0274		90.0881	90.0881	2.2700e-003		90.1448
Total	**0.0390**	**0.0244**	**0.2824**	**9.0000e-004**	**0.1006**	**7.2000e-004**	**0.1013**	**0.0267**	**6.7000e-004**	**0.0274**		**90.0881**	**90.0881**	**2.2700e-003**		**90.1448**

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	4.0506					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**4.2551**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	0.0390	0.0244	0.2824	9.0000e-004	0.0954	7.2000e-004	0.0961	0.0254	6.7000e-004	0.0261		90.0881	90.0881	2.2700e-003		90.1448
Total	**0.0390**	**0.0244**	**0.2824**	**9.0000e-004**	**0.0954**	**7.2000e-004**	**0.0961**	**0.0254**	**6.7000e-004**	**0.0261**		**90.0881**	**90.0881**	**2.2700e-003**		**90.1448**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Pedestrian Network

	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	0.3450	1.7265	4.0053	0.0145	1.2491	0.0120	1.2610	0.3342	0.0112	0.3453		1,479.5818	1,479.5818	0.0752		1,481.4628
Unmitigated	0.3919	2.0628	5.1713	0.0197	1.7260	0.0160	1.7420	0.4618	0.0149	0.4767		2,004.4229	2,004.4229	0.0969		2,006.8461

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	237.80	237.80	237.80	812,107	587,683
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	237.80	237.80	237.80	812,107	587,683

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
Condo/Townhouse	14.70	5.90	8.70	40.00	19.00	41.00	86	11	3
Enclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Enclosed Parking with Elevator	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896
Parking Lot	0.552111	0.043066	0.201891	0.118512	0.015605	0.005863	0.021387	0.031253	0.002087	0.001818	0.004803	0.000708	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
NaturalGas Unmitigated	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397

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					
Condo/Townhouse	1929.42	0.0208	0.1778	0.0757	1.1300e-003		0.0144	0.0144		0.0144	0.0144		226.9908	226.9908	4.3500e-003	4.1600e-003	228.3397
Enclosed Parking with Elevator	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
Parking Lot	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		**0.0208**	**0.1778**	**0.0757**	**1.1300e-003**		**0.0144**	**0.0144**		**0.0144**	**0.0144**		**226.9908**	**226.9908**	**4.3500e-003**	**4.1600e-003**	**228.3397**

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					
Condo/Townhouse	1.28689	0.0139	0.1186	0.0505	7.6000e-004		9.5900e-003	9.5900e-003		9.5900e-003	9.5900e-003		151.3994	151.3994	2.9000e-003	2.7800e-003	152.2991
Enclosed Parking with Elevator	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
Parking Lot	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		**0.0139**	**0.1186**	**0.0505**	**7.6000e-004**		**9.5900e-003**	**9.5900e-003**		**9.5900e-003**	**9.5900e-003**		**151.3994**	**151.3994**	**2.9000e-003**	**2.7800e-003**	**152.2991**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	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	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476

Unmitigated	1.0691	0.6172	3.6366	3.8700e-003		0.0655	0.0655		0.0655	0.0655	0.0000	744.1001	744.1001	0.0201	0.0135	748.6331

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	0.0732					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8255					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0677	0.5781	0.2460	3.6900e-003		0.0467	0.0467		0.0467	0.0467	0.0000	738.0000	738.0000	0.0141	0.0135	742.3856
Landscaping	0.1027	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187		6.1001	6.1001	5.9000e-003		6.2476
Total	**1.0691**	**0.6172**	**3.6366**	**3.8700e-003**		**0.0655**	**0.0655**		**0.0655**	**0.0655**	**0.0000**	**744.1001**	**744.1001**	**0.0200**	**0.0135**	**748.6331**

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	0.0732					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8255					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.1027	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187		6.1001	6.1001	5.9000e-003		6.2476

Total	1.0015	0.0391	3.3906	1.8000e-004		0.0187	0.0187		0.0187	0.0187	0.0000	6.1001	6.1001	5.9000e-003	0.0000	6.2476

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

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

APPENDIX C
Biological Resources Assessment and Arborist Statement

May 31, 2019 JN 172409

ARROYO DEVELOPMENT, LLC
Attn: Frank Lac
2409 #A Strozier Avenue
South El Monte, California 91733

SUBJECT: Results of a Biological Resources Assessment for the Arroyo Village Residential Condominium Project – City of San Gabriel, Los Angeles County, California

Dear Mr. Lac,

Michael Baker International (Michael Baker) is pleased to submit this report to Arroyo Development, LLC, documenting the results of a biological resources assessment for the proposed Arroyo Village Residential Condominium Project (project or project site) located in the City of San Gabriel, Los Angeles County, California. Michael Baker conducted a literature review and field survey to characterize existing site conditions and assess the potential for special-status[1] plant and wildlife species to occur on or within the immediate vicinity of the project site that could pose a constraint to implementation of the proposed project. Specifically, this report provides a detailed assessment of the suitability of the on-site habitat to support special-status plant and wildlife species that were identified by the CDFW California Natural Diversity Database RareFind 5 (CNDDB), the CNPS Online Inventory of Rare and Endangered Plants of California (Online Inventory), and other databases as potentially occurring in the vicinity of the project site.

Project Location

The project site is generally located north of State Route 10, south of State Route 210, and west of Highway 19 in the Cities of San Gabriel and Alhambra, Los Angeles County, California (refer to Figure 1, *Regional Vicinity*). The project site is approximately 1.12 acres and is located at 235 South Arroyo Drive in the City of San Gabriel (Assessor's Parcel Numbers [APN] 5346-011-001, 5346-011-004, and 5346-011-006). A limited portion of the project site is located in the City of Alhambra at APN 5346-008-031, 5346-009-008, and 5346-009-010. The project site is depicted in Section 11 of Township 1 South, Range 12 West, on the United States Geological Survey (USGS) *El Monte, California* 7.5-minute quadrangle (refer to Figure 2, *Project Vicinity*). Specifically, the proposed project is located west of South Arroyo Drive, east of South Vega Street, and south of Hampton Court (refer to Figure 3, *Survey Area*).

[1] As used in this report, "special-status" refers to plant and wildlife species that are Federally-/State-listed, proposed, or candidates; plant species that have been designated a California Rare Plant Rank (CRPR) species by the California Native Plant Society (CNPS); wildlife species that are designated by the California Department of Fish and Wildlife (CDFW) as Fully Protected, Species of Special Concern, or Watch List species; and State/locally rare vegetation communities.

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Office: 949-472-3505 | Fax: 949-472-8373

Project Description

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The exterior building colors would include neutral earth tones (whites, beiges, browns) with red accents, while the project's exterior building materials would exemplify architectural elements associated with the Spanish Colonial architecture used in San Gabriel since the eighteenth century. Exterior finishes would include a smooth stucco finish with sand-finished accents, clay Spanish tile roofing, Spanish glazed tile, wrought-iron railings and grilles, wood columns and trellises, circular archways metal louvers, awnings, and decorative pre-cast molding and columns, and a dome with an architectural ornament. In addition, a vehicular bridge with a pedestrian walkway would be installed at the southern portion of the project site to provide project access at South Arroyo Drive (refer to Figure 4, *Conceptual Site Plan*).

Methodology

Michael Baker conducted thorough literature reviews and records searches to determine which special-status biological resources have the potential to occur on or within the general vicinity of the survey area prior to conducting the field survey. The survey area consisted of all areas within the project footprint, along with undeveloped areas within 100 feet of the project footprint, where accessible. A general biological resources assessment was conducted in order to document existing site conditions and determine the potential for special-status plant and wildlife species to occur within the survey area.

Literature Review

Prior to conducting the field survey, literature reviews and records searches were conducted for special-status biological resources potentially occurring on or within the vicinity of the survey area. Previous special-status plant and wildlife species occurrence records within the USGS *Pasadena, Mt. Wilson, Los Angeles,* and *El Monte, California* 7.5-minute quadrangles were determined through a query of the CNDDB, CNPS Online Inventory, Calflora Database, and species listings provided by the CDFW and the United States Fish and Wildlife Service (USFWS). In addition, Michael Baker reviewed all available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the survey area to gain an understanding of existing site conditions, confirm previous species observations, and note the extent of any disturbances that have occurred within the survey area that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- City of San Gabriel General Plan (2004);
- Alhambra General Plan (2019);
- Google Earth Pro Historical Aerial Imagery from 1994 to 2019 (Google, Inc., 2019);
- Los Angeles County General Plan (2015);
- Species Accounts provided by Birds of North America (Online);

- United States Department of Agriculture's (USDA) *Custom Soil Resource Report for Los Angeles County, California, Southeastern Part* (2019); and
- USFWS Critical Habitat Mapper and Environmental Conservation Online System.

Field Survey / Habitat Assessment

Michael Baker biologists Stephen Anderson and Tom Millington conducted a biological resources assessment on May 1, 2019, between 1000 and 1130 hours to confirm existing site conditions within the survey area. Michael Baker extensively surveyed all special-status habitats and/or natural areas, where accessible, which have a higher potential to support special-status plant and wildlife species. Vegetation communities occurring within the survey area were mapped on an aerial photograph. Classification of the on-site vegetation communities and other land uses is based on the descriptions provided in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), with modifications to better represent existing conditions in the field using the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008), an expanded vegetation classification system based on Holland (1986). In addition, site characteristics such as soil condition, topography, hydrology, anthropogenic disturbances, indicator species, condition of on-site vegetation communities, and the presence of potentially regulated jurisdictional features were noted. Michael Baker used Geographic Information Systems (GIS) ArcView software to digitize the mapped vegetation communities and then transferred these data onto an aerial photograph to further document existing conditions and quantify the acreage of each vegetation community.

All plant and wildlife species observed, as well as dominant plant species within each vegetation community, were recorded in a field notebook. Plant species observed during the survey were identified by visual characteristics and morphology in the field while unusual and less familiar plant species were photographed and later identified in the laboratory using taxonomical guides. Plant nomenclature used in this report follows the Jepson Flora Project (2018) and scientific names are provided immediately following common names of plant species (first reference only). Wildlife detections were made through aural and visual detection, as well as observation of sign including scat, trails, tracks, burrows, and nests. Field guides used to assist with identification of species during the field survey included *The Sibley Guide to Birds* (Sibley, 2014), *A Field Guide to Western Reptiles and Amphibians* (Stebbins, 2003), and *A Field Guide to Mammals of North America* (Reid, 2006). Although common names of wildlife species are well standardized, scientific names are provided immediately following common names of wildlife species in this report (first reference only).

Existing Site Conditions

The survey area is located within the west end of the City of San Gabriel and is mainly composed of disturbed and ornamental vegetation. The survey area is broken up into two separate parcels separated by Alhambra Wash, a concrete-lined flood control channel. The east parcel contains disturbed vegetation, while the western parcel contains mainly disturbed vegetation with a single residential home. The survey area is surrounded by residential development and disturbed and ornamental vegetation.

The survey area is located at an elevation of approximately 420 feet above mean sea level and is generally flat. According to the USDA *Custom Soil Resource Report for Los Angeles County, California, Southeastern Part*, the survey area is underlain by the mapped soil unit, Urban land-Azuvina-Montebello complex, 0 to 5 percent slopes (1138) (refer to Figure 5, *USDA Soils*). Refer to Attachment B for representative photographs taken throughout the survey area.

Vegetation Communities and Land Cover Types

One (1) native vegetation community was observed and mapped within the survey area, coast live oak woodland. In addition, the survey area contains land cover types that would be classified as disturbed and developed. These vegetation communities and land cover types are depicted on Figure 6, *Vegetation Communities and Land Uses*, and described in further detail below. Additionally, refer to *Table C-1: Plant Species Observed List*, provided in Attachment C, for a complete list of plant species observed within the survey area during the field survey.

Coast Live Oak Woodland (0.05 acres)

The survey area contains approximately 0.05 acre of coast live oak woodland. Coast live oak (*Quercus agrifolia*) dominates this plant community with common bedstraw (*Galium aparine*), Bermuda buttercup (*oxalis pes-caprae*), Italian thistle (*Carduus pycnocephalus*), and various non-native grasses within the understory.

Disturbed Habitat (1.75 acres)

Disturbed areas comprise approximately 1.75 acres of the survey area. These areas consist of unpaved or dirt areas that are exposed to various anthropogenic disturbances (i.e., vehicle traffic, dumping, weed abatement), along with areas that are dominated by non-native, ornamental vegetation. Surface soils within these areas support non-native and ruderal/weedy plant species and have been heavily mixed and compacted.

Urban/Developed (0.06 acres)

Developed areas comprise approximately 0.06 acre of the survey area and consist of the residential building located within the survey area.

Wildlife

Natural vegetation communities provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. This section provides a general discussion of those wildlife species that were observed by Michael Baker during the field survey or that are expected to occur based on existing site conditions. The discussion is to be used as a general reference and is limited by the season, time of day, and weather conditions in which the field survey was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation. Refer to *Table C-2: Wildlife Species Observed List*, provided in Attachment C, for a complete list of wildlife species observed within the survey area during the May 2019 field survey.

Fish

No fish were observed within the survey area during the field survey. Alhambra Wash is located immediately adjacent to the survey area. However, this drainage has been converted into a concrete-lined channel. Therefore, no fish are expected to occur within the survey area.

Amphibians

No amphibians were observed within the survey area during the field survey. Alhambra Wash is located immediately adjacent to the survey area. However, this drainage has been converted into a concrete-lined channel. Therefore, no amphibians are expected to occur within the survey area.

Reptiles

The survey area and surrounding habitat have the potential to support a variety of reptilian species adapted to a highly urban environment. Great Basin fence lizard (*Sceloporus occidentalis longipes*) was the only reptilian species observed during the field survey. Due to the surrounding development, most other reptilian species have a low potential to occur within the survey area.

Birds

The survey area provides suitable habitat for a variety of resident and migrant bird species. Bird species detected during the field survey included Anna's hummingbird (*Calypte anna*), Allen's hummingbird (*Selasphorus sasin*), American kestrel (*Falco sparverius*), northern mockingbird (*Mimus polyglottos*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculatus*), black-headed grosbeak (*Pheucticus melanocephalus*), western tanager (*Piranga ludoviciana*), Cassin's kingbird (*Tyrannus vociferans*), house finch (*Haemorhous mexicanus*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), and American crow (*Corvus brachyrhynchos*).

Nesting birds are protected pursuant to the Federal Migratory Bird Treaty Act (MBTA) of 1918 and the California Fish and Game Code (CFGC).[2] To maintain compliance with the MBTA and CFGC, clearance surveys are typically required prior to any ground disturbance or vegetation removal activities to avoid direct and indirect impacts to active bird nests and/or nesting birds. Consequently, if an active bird nest is destroyed or if project activities result in indirect impacts (e.g., nest abandonment, loss of reproductive effort) to nesting birds, it is considered "take" and is potentially punishable by fines and/or imprisonment. The survey area provides suitable foraging and nesting habitat for a variety of year-round and seasonal avian residents as well as migrating songbirds that could occur in the area. The survey area also has the potential to support birds that nest on the open ground such as killdeer (*Charadrius vociferous*). No nests or birds displaying nesting behavior were observed within the survey area during the field survey.

Mammals

The survey area and surrounding habitat has the potential to support a variety of mammalian species adapted to a highly urban environment. However, most mammalian species are nocturnal and are difficult to observe during a diurnal field survey. California ground squirrel (*Otospermophilus beecheyi*) was the only mammalian species observed during the field survey. Other common mammalian species expected to occur within the survey area include opossum (*Didelphis virginiana*) and raccoon (*Procyon lotor*).

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[2] Section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the CFGC or any regulation made pursuant thereto; Section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey); and Section 3513 makes it unlawful to take or possess any migratory non-game bird except as provided by the rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA, as amended (16 U.S.C. § 703 *et seq.*).

Bats occur throughout most of southern California and may use the survey area as foraging habitat. Common bat species that may forage within the survey area include California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*). Hollow tree snags or limbs provide potential roosting opportunities for these species. However, these features are not prevalent within the survey area.

Migratory Corridors and Linkages

Habitat linkages provide links between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet, inadequate for others. Wildlife corridors are key features for dispersal, seasonal migration, breeding, and foraging. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

Due to the highly disturbed nature of the survey area and the presence of development surrounding the entire survey area, it was determined that the survey area does not function as a migratory corridor or linkage for wildlife species. In addition, Alhambra Wash has been modified into a concrete-lined flood control channel and does not function as a migratory corridor or linkage.

State and Federal Jurisdictional Areas

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The U.S. Army Corps of Engineers (Corps) Regulatory Branch regulates discharge of dredged or fill material into “waters of the U.S.” (WoUS) pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the Regional Water Quality Control Board (Regional Board) regulates discharges to surface waters pursuant to Section 401 of the CWA and Section 13263 of the California Porter-Cologne Water Quality Control Act and the CDFW regulates alterations to streambed and associated vegetation communities under Section 1600 *et seq*. of the CFGC.

Based on results of the literature review and field survey, Michael Baker determined that no potential State or Federal jurisdictional resources occur within the survey area. The proposed project includes the placement of a bridge over the channel adjacent to the survey area; however, this bridge will not impact any State or Federal jurisdictional areas and would comply with the operational and maintenance needs and requirements set forth by the Corps. Because the Alhambra Wash is a Corps facility, a permit has been issued by the Corps for this project (File No. SPL408-2016-027). Arroyo Development, LLC, would not be required to obtain any additional regulatory approvals prior to implementation of the proposed project.

Special-Status Biological Resources

The CNDDB and CNPS Online Inventory were queried for reported locations of special-status plant and wildlife species as well as special-status natural vegetation communities in the USGS *Pasadena*, *Mt. Wilson*, *Los Angeles*, and *El Monte*, *California* 7.5-minute quadrangles. The habitat was conducted to assess and the conditions of the habitat(s) within the boundaries of the survey area to determine if the existing vegetation communities, at the time of the field survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The literature search identified forty-eight (48) special-status plant species, twenty-nine (29) special-status wildlife species, and five (5) special-status vegetation communities records for the USGS *Pasadena, Mt. Wilson, Los Angeles,* and *El Monte, California* 7.5-minute quadrangles. Special-status plant and wildlife species were evaluated for their potential to occur within the survey area based on habitat requirements, availability and quality of suitable habitat, and known distributions. Special-status biological resources identified during the literature review as having the potential to occur within the vicinity of the survey area are presented in *Table D-1: Potentially Occurring Special-Status Biological Resources*, provided in Attachment D. Refer to the following sections and information provided in Attachment D for a detailed analysis regarding the potential occurrence of special-status plant and wildlife species.

Special-Status Plants

Forty-eight (48) special-status plant species have been recorded in the USGS *Pasadena, Mt. Wilson, Los Angeles,* and *El Monte, California 7.5-minute quadrangle*s by the CNDDB and CNPS Online Inventory (refer to Attachment D). No special-status plant species were observed within the survey area during the field survey. Based on the results of the field survey and a review of specific habitat preferences, distributions, and elevation ranges, it was determined that all special-status plant species identified by the CNDDB and CNPS Online Inventory are not expected to occur within the survey area.

Special-Status Wildlife

Twenty-nine (29) special-status wildlife species have been recorded in the USGS *Pasadena, Mt. Wilson, Los Angeles,* and *El Monte, California* 7.5-minute quadrangles by the CNDDB (refer to Attachment D). No special-status wildlife species were observed within the survey area during the field survey. Based on the results of the literature review and field survey, Michael Baker determined that all special-status wildlife species identified by the CNDDB either have a low potential or are not expected to occur within the survey area due to a lack of suitable habitat.

Special-Status Vegetation Communities

Five (5) special-status vegetation communities have been reported in the USGS *Pasadena, Mt. Wilson, Los Angeles,* and *El Monte, California* 7.5-minute quadrangles by the CNDDB. Based on the results of the field survey, no special-status vegetation communities occur within the survey area.

Critical Habitat

No critical habitat has been mapped by the USFWS within or adjacent to the survey area. Since the proposed project will not result in the loss or adverse modification to Critical Habitat, consultation with the USFWS under Section 7 of the FESA would not be required (refer to Figure 7, *Critical Habitat*; USFWS, 2005).

Local, Regional, and State Habitat Conservation Plans

The proposed project is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan. Therefore, the proposed project would have no effect to any local, regional, or State Habitat Conservation Plans.

Conclusions and Recommendations

The survey area is located within the west end of the City of San Gabriel and is mainly composed of residential and commercial land uses. One (1) native vegetation community was observed and mapped within the survey area, coast live oak woodland. In addition, the survey area contains land cover types that would be classified as disturbed and developed.

No special-status plant species were observed during the field survey. Based on the results of the field survey and a review of specific habitat preferences, distributions, and elevation ranges, it was determined that all special-status plant species identified by the CNDDB and CNPS Online Inventory are not expected to occur within the survey area and focused surveys are not recommended. As a result, the proposed project is not expected to result in any impacts special-status plant species.

No special-status wildlife species identified by the CNDDB were observed within the survey area during the field survey. Based on the results of the literature review and field survey, Michael Baker determined that all special-status wildlife either have a low potential to occur or are not expected within the survey area based on specific habitat requirements, occurrence records, and known distributions. As a result, the proposed project is not expected to result in any impacts special-status wildlife species.

Nesting birds are protected under the MBTA, the Bald and Golden Eagle Protection Act, and the CFGC. If project-related activities are to be initiated during the nesting season (January 1st to August 31st), a pre-construction nesting bird clearance survey would need to be conducted by a qualified biologist no more than three (3) days prior to the start of any vegetation removal or ground disturbing activities. The qualified biologist should survey all suitable nesting habitat within the project impact area, and areas within a biologically defensible buffer (to be determined by the biologist) surrounding the project impact area, for nesting birds prior to initiating project-related activities during the nesting season. If no active nests are detected during the clearance survey, project activities may begin, and no additional avoidance and minimization measures would be required. If an active nest is found, the bird should be identified to species and a “no-disturbance” buffer should be established around the active nest. The size of the “no-disturbance” buffer should be increased or decreased based on the judgement of the qualified biologist and level of activity and sensitivity of the species. It is further recommended that the qualified biologist periodically monitor any active nests to determine if project-related activities occurring outside the “no-disturbance” buffer disturb the birds and if the buffer should be increased. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, project activities within the “no-disturbance” buffer may occur.

Based on the project plans and site visit, no impacts will occur to State or Federal jurisdictional areas. Out of an abundance of caution, it is recommended that Arroyo Development, LLC, delineate the outer perimeter of the project impact area, including all access routes, with appropriate fencing, signage, and/or flagging to prevent the inadvertent damage/encroachment of project-related equipment into adjacent habitats. In addition, it is recommended that appropriate erosion and sediment control barriers be installed around the perimeter of the project impact area to prevent the accidental discharge of sediment and pollutants during project-related activities.

The survey area is not located within Federally designated Critical Habitat. Since the proposed project will not result in adverse modification of Critical Habitat, consultation with the USFWS under Section 7 of the FESA would not be required.

Please do not hesitate to contact me at (949) 472-3407 or dan.rosie@mbakerintl.com or Stephen Anderson at (949) 330-4176 or stephen.anderson@mbakerintl.com should you have any questions or require further information regarding this report.

Sincerely,

Dan Rosie
Senior Biologist
Natural Resources and Regulatory Permitting

Stephen Anderson
Biologist
Natural Resources and Regulatory Permitting

Attachments:

- *A. Project Figures*
- *B. Site Photographs*
- *C. Plant and Wildlife Species Observed List*
- *D. Potentially Occurring Special-Status Biological Resources*

Attachment A

Project Figures

5/10/2019 JN M:\Mdata\172409\GIS\MXD\Fig 01 Regional Vicinity.mxd RP

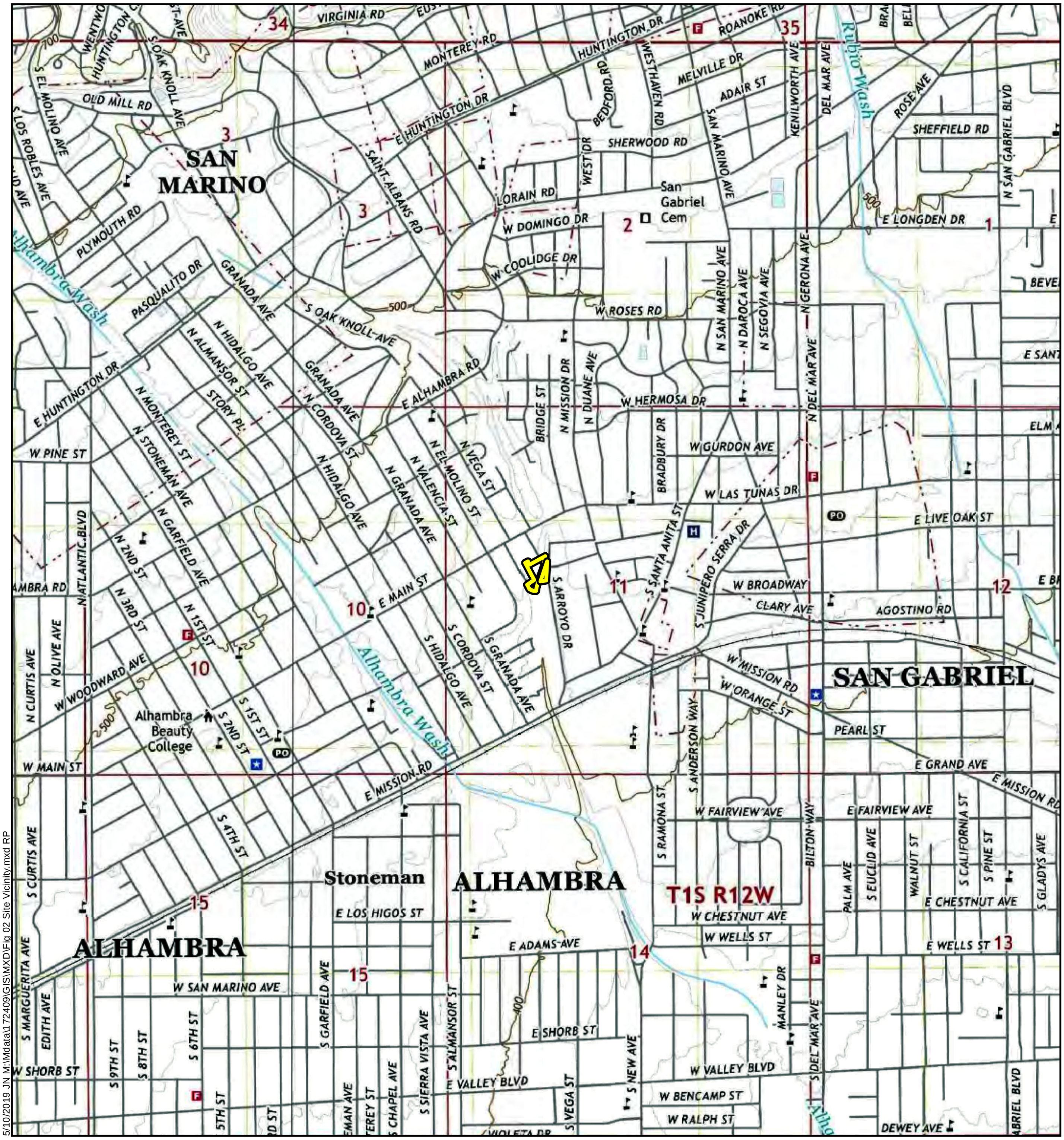
Michael Baker INTERNATIONAL

Source: ArcGIS Online, 2018

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

Regional Vicinity

Figure 1



Legend

Survey Area

0 0.25 0.5 Miles

Michael Baker INTERNATIONAL

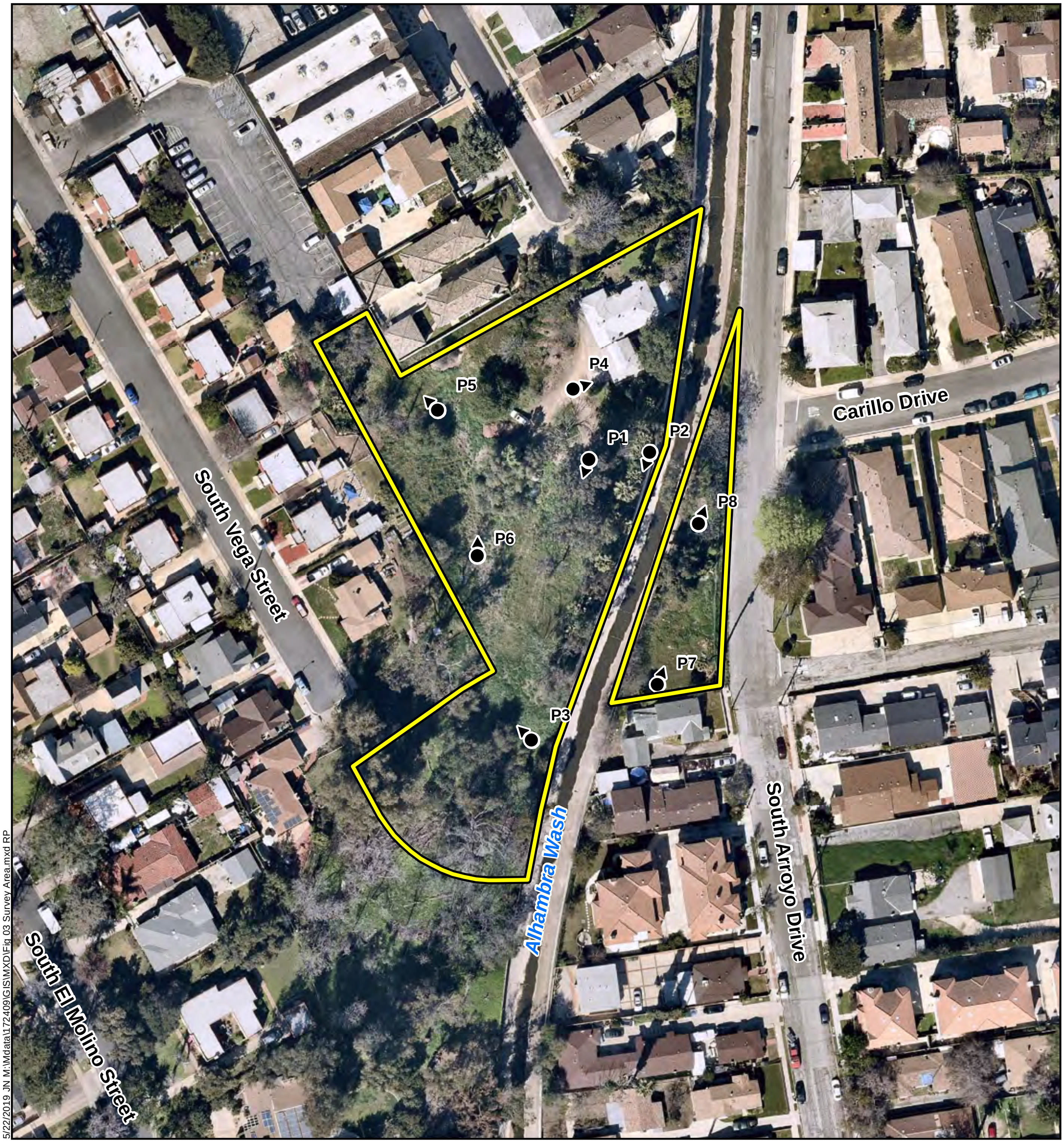
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

Site Vicinity

Source: ArcGIS Online, 2018, USGS 7.5-Minute topographic quadrangle maps: *El Monte, California (2018)*

Figure 2

5/10/2019 JN M:\Mdata\172409\GIS\MXD\Fig 02 Site Vicinity.mxd RP



5/22/2019 JN M:\Mdata\172409\GIS\MXD\Fig 03 Survey Area.mxd RP

Legend

Survey Area

Photograph Point and Direction

Michael Baker INTERNATIONAL

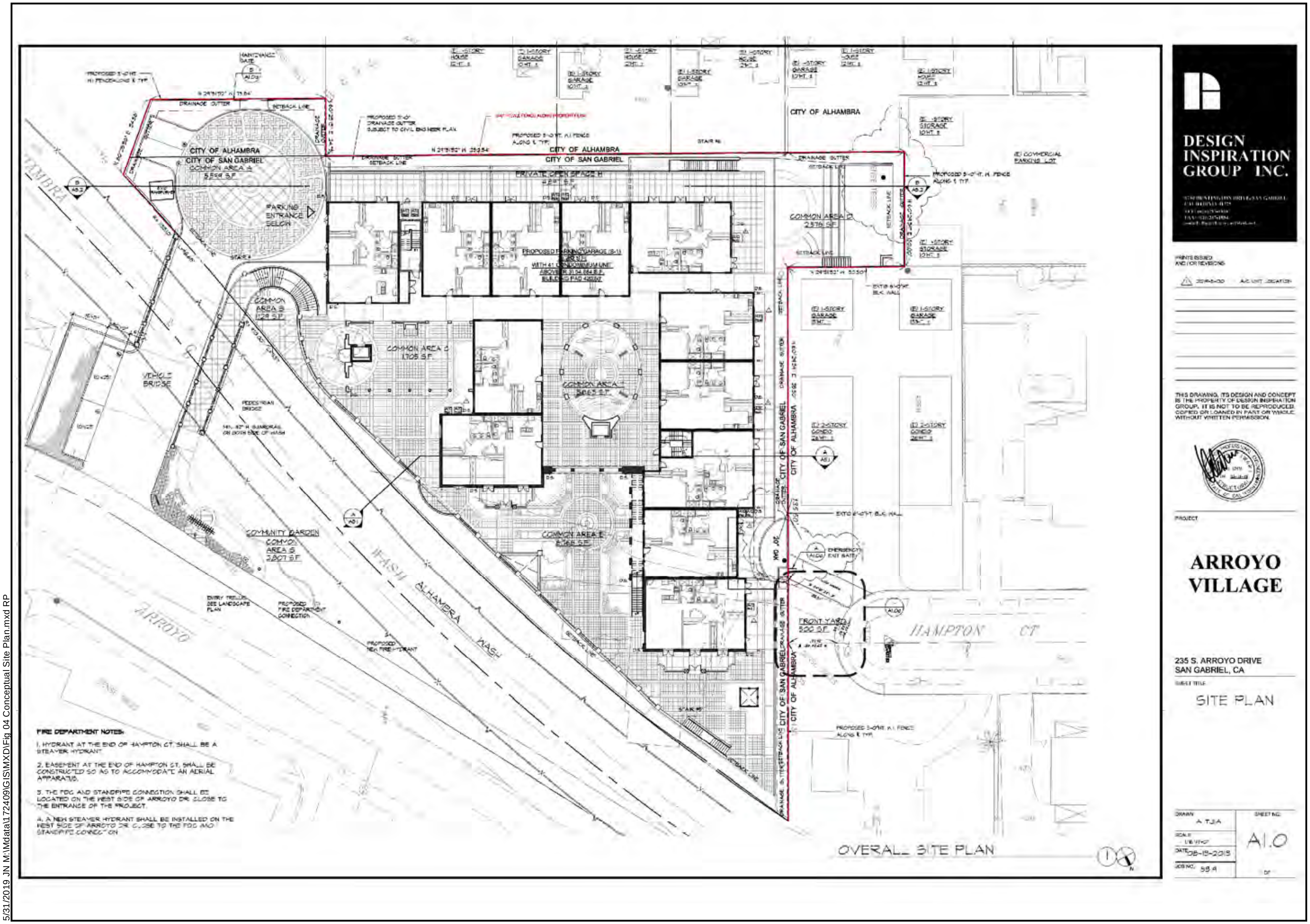
0 100 200 Feet

Source: Nearmap, 2019

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

Survey Area

Figure 3



5/31/2019 JN M:\Mdata\172409\GIS\MXD\Fig 04 Conceptual Site Plan.mxd RP

Michael Baker INTERNATIONAL

NOT TO SCALE

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
HABITAT ASSESSMENT

Conceptual Site Plan

Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

Figure 4

5/22/2019 JN M:\Mdata\172409\GIS\MXD\Fig 05 USDA Soils.mxd RP

Legend

Survey Area

1138 Urban Land - Azuvina-Montebellow Complex, 0 to 5 percent slopes

Michael Baker INTERNATIONAL

0 100 200 Feet

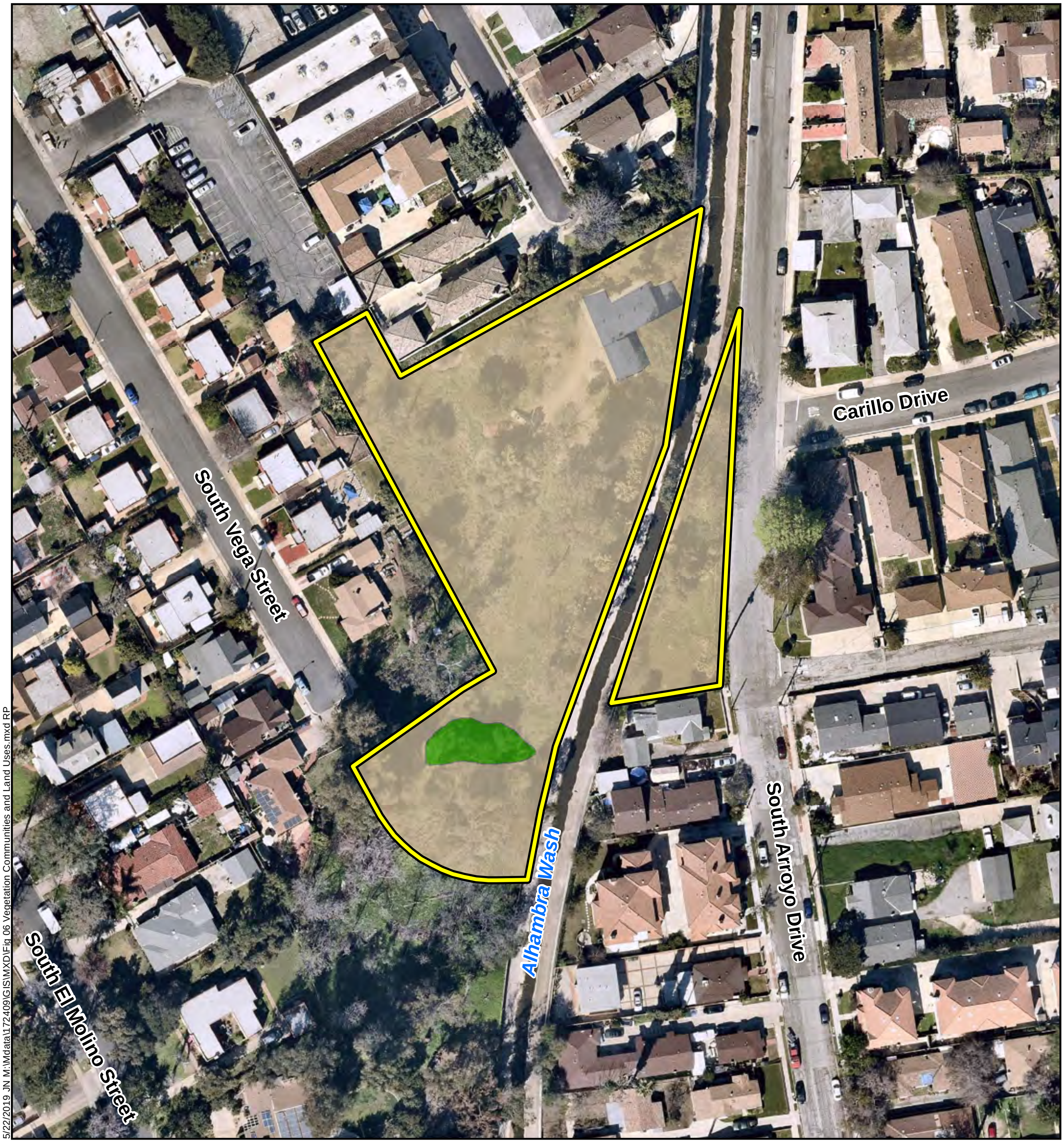
Source: USDA, 2017, Nearmap, 2019

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

USDA Soils

Figure 5

5/22/2019 JN M:\Mdata\172409\GIS\MXD\Fig 06 Vegetation Communities and Land Uses.mxd RP



Legend

Survey Area

Vegetation Communities

Coast Live Oak Woodland (0.05 acre)

Disturbed Habitat (1.75 acres)

Urban/Developed (0.06 acre)

Michael Baker INTERNATIONAL

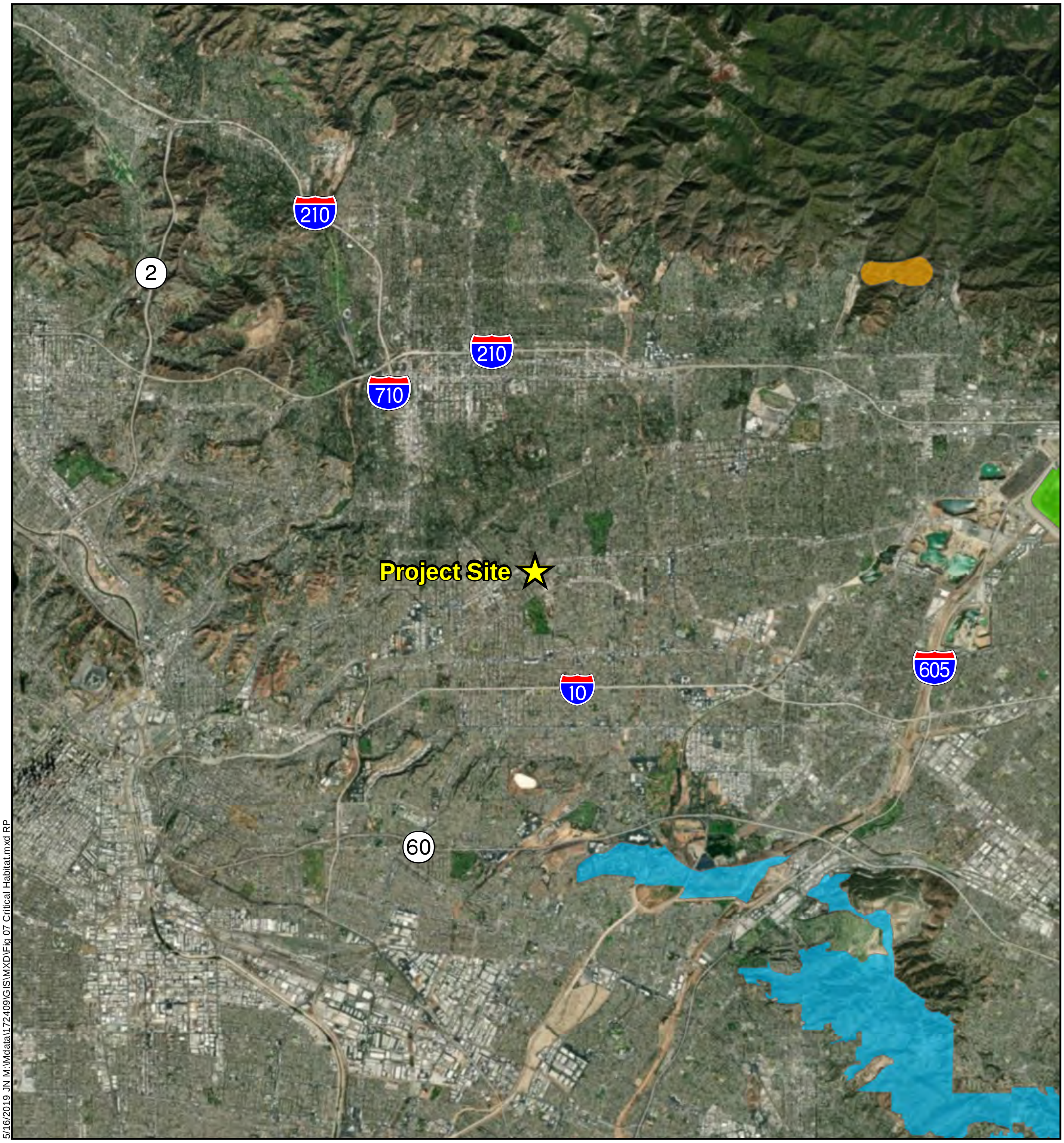
0 100 200 Feet

Source: Nearmap, 2019

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

Vegetation Communities and Land Uses

Figure 6



5/16/2019 JN M:\Mdata\172409\GIS\MXD\Fig 07 Critical Habitat.mxd RP

Legend

- Braunton's milk-vetch
- Coastal California gnatcatcher
- Southwestern willow flycatcher

0 1 2 Miles

Source: Nearmap, 2019

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT
BIOLOGICAL RESOURCES ASSESSMENT

Critical Habitat

Figure 7

Attachment B

Site Photographs

Photograph 1: View of the recently mowed, disturbed area within the central portion of the west parcel within the survey area, facing southwest.

Photograph 2: Looking down the concrete drainage immediately adjacent to the survey area, facing south.

Photograph 3: View of the transition between disturbed vegetation and oak woodland located in the southern portion of the west parcel, facing northwest.

Photograph 4: View of the residential building located in the northern portion of the west parcel, facing northeast.

Photograph 5: View of the northwest corner of the west parcel, facing northwest.

Photograph 6: View of the disturbed vegetation within the west parcel, facing north.

Photograph 7: Standing at the south end of east parcel within the survey showing disturbed areas, facing northeast.

Photograph 8: View of the disturbed vegetation located in the north portion of the east parcel, facing north.

Attachment C

Plant and Wildlife Species Observed List

Table C-1: Plant Species Observed List

Scientific Name	**Common Name**	**Cal-IPC Rating****	**Special-Status Rank**
	Plants		
*Acacia melanoxylon**	blackwood acacia	Limited	
*Ailanthus altissima**	tree of heaven	Moderate	
*Araucaria heterophylla**	Norfolk Island pine		
Artemisia douglasiana	California mugwort		
*Avena fatua**	wild oat	Moderate	
Baccharis salicifolia	mule fat		
*Bougainvillea spectabilis**	bougainvillea		
*Bromus diandrus**	ripgut brome	Moderate	
*Carduus pycnocephalus**	Italian thistle	Moderate	
*Crassula ovata**	jade plant		
Cucurbita palmata	coyote gourd		
*Cynodon dactylon**	Bermuda grass	Moderate	
*Ehrharta erecta**	panic veldtgrass	Moderate	
*Erodium cicutarium**	red stemmed filaree	Limited	
*Erodium moschatum**	white stemmed filaree		
*Eucalyptus globulus**	blue gum	Limited	
*Ficus carica**	common fig	Moderate	
*Foeniculum vulgare**	fennel	High	
*Fortunella japonica**	round kumquat		
Galium aparine	common bedstraw		
*Hordeum murinum**	fox tail barley	Moderate	
*Jacaranda mimosifolia**	black poui		
*Lysimachia arvensis**	scarlet pimpernel		
*Malva parviflora**	cheeseweed		
*Morus alba**	mulberry		
*Nerium oleander**	oleander		
*Nicotiana glauca**	tree tobacco	Moderate	
*Olea europaea**	olive	Limited	
*Oxalis pes-caprae**	Bermuda buttercup	Moderate	
*Pinus halepensis**	Aleppo pine		
*Pinus pinea**	Italian stone pine		
Quercus agrifolia	coast live oak		
*Raphanus sativus**	wild radish	Limited	
*Ricinus communis**	castor bean	Limited	
*Schinus molle**	Peruvian pepper tree	Limited	
*Schinus terebinthifolius**	Brazilian pepper tree	Limited	
Solanum americanum	common nightshade		
*Solanum capsicoides**	cockroach berry		
*Sonchus oleraceus**	common sow thistle		
*Stipa miliacea**	smilo grass		
*Taraxacum officinale**	common dandelion		
Thuja plicata	western red cedar		
*Trachelospermum jasminoides**	confederate jasmine		
*Ulmus parvifolia**	Chinese elm		

Table C-1: Plant Species Observed List

Scientific Name	**Common Name**	**Cal-IPC Rating****	**Special-Status Rank**
Plants			
*Vinca minor**	common periwinkle		
*Washingtonia robusta**	Mexican fan palm	Moderate	

Table C-2: Wildlife Species Observed List

Scientific Name	**Common Name**	**Special-Status Rank**
Birds		
Calypte anna	Anna's hummingbird	
Corvus brachyrhynchos	American crow	
Falco sparverius	American kestrel	
Haemorhous mexicanus	house finch	
Mimus polyglottos	northern mockingbird	
Melozone crissalis	California towhee	
Passer domesticus	house sparrow	
Pheucticus melanocephalus	black-headed grosbeak	
Pipilo maculatus	spotted towhee	
Piranga ludoviciana	western tanager	
Selasphorus sasin	Allen’s hummingbird	
Tyrannus vociferans	Cassin’s kingbird	
Zenaida macroura	mourning dove	
Mammals		
Otospermophilus beecheyi	California ground squirrel	
Reptiles		
Sceloporus occidentalis longipes	Great Basin fence lizard	

* Non-native species

** **California Invasive Plant Council (Cal-IPC) Ratings**

High — These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate — These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited — These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Attachment D

Potentially Occurring Special-Status Biological Resources

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
SPECIAL-STATUS WILDLIFE SPECIES				
Anaxyrus californicus arroyo toad	FE SSC G2G3 S2S3	Occurs in semi-arid regions near washes or intermittent streams, including valley-foothill grasslands, desert riparian, desert washes, and oak woodlands. Breeding habitat consists of shallow streams with a mixture of sandy and gravelly substrate and sandy terraces. Generally, requires mule fat (*Baccharis salicifolia*) and willow in the streambed for vegetative canopy for breeding areas and forages for insects primarily under oak (*Quercus* spp.), Fremont cottonwood (*Populus fremontii*), and California sycamore (*Platanus racemosa*) trees. Occurs at elevations from near sea level to about 4,600 feet above mean sea level (amsl).	No	**Not Expected** Alhambra Wash is adjacent to the survey area. However, this stream had been channelized with concrete and is roughly 10 feet below the elevation of the project site. Further, the nearest occurrence is roughly 11 miles northeast of the survey area (Occurrence Number 151; CNDDB 2017).
Anniella stebbinsi southern California legless lizard	SSC G3 S3	Locally abundant specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans. A large protected population persists in the remnant of the once extensive El Segundo Dunes at Los Angeles International Airport.	No	**Not Expected** There is no coastal sand dunes, sandy washes, or alluvial fan habitat within the survey area.
Antrozous pallidus pallid bat	SSC G5 S3	Locally common species locally common in the Great Basin, Mojave, and Sonoran deserts (specifically Sonoran life zone) and grasslands throughout the western U.S. Also occurs in shrublands, woodlands, and forests from sea level to 8,000 ft amsl. Prefers rocky outcrops, cliffs, and crevices for roosting with access to open habitats for foraging. May also roost in caves, mines, bridges, barns, porches, and bat boxes, and even on the ground under burlap sacks, stone piles, rags, baseboards, and rocks.	No	**Low (Foraging)** Suitable foraging habitat (woodlands) is marginally present within the survey area. There is no suitable roosting habitat within the survey area. Further, the nearest documented occurrence is 3 miles to the southeast of the survey area (Occurrence Number 197; CNDDB 2006).
Arizona elegans occidentalis California glossy snake	SSC G5T2 S2	Inhabits arid scrub, rocky washes, grasslands, and chaparral habitats. Appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing.	No	**Not Expected** There is no arid scrub, rocky washes, grasslands, or chaparral habitat within the survey area.
Aspidoscelis tigris stejnegeri coastal whiptail	SSC G5T5 S3	This subspecies is found in coastal southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges, and north into Ventura County. Ranges south into Baja California. Found in a variety of ecosystems, primarily hot and dry open areas with sparse vegetation in chaparral, woodland, and riparian areas. Associated with rocky areas with little vegetation or sunny microhabitats within shrub or grassland associations.	No	**Not Expected** There is no suitable habitat within the survey area.
Athene cunicularia burrowing owl	SSC G4 S3	Yearlong resident of California. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Not Expected** Most of the survey area is vegetated with a variety of low-growing plant species that allow for open line-of-sight. The survey area does not have suitable burrows (≥ 4 inches in diameter) that are needed to provide roosting and nesting opportunities. Further, the nearest documented occurrence is 3.5 miles to the northwest of the survey area, and this occurrence occurred in 1895 (Occurrence Number 1831; CNDDB 2011).

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Bombus crotchii Crotch bumble bee	G3G4 S1S2	Found from coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	No	**Not Expected** There are no food plant genera within the survey area.
Buteo swainsoni Swainson's hawk	ST G5 S3	Summer migrant in southern California. Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grassland or suitable grain or alfalfa fields or livestock pastures.	No	**Not Expected** There is no open desert, grassland, cropland, riparian, juniper-sage flats, or oak savannah habitat within the survey area.
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT SE G5T2T3 S1	Uncommon summer resident where its breeding distribution is restricted to isolated sites in the Sacramento, Armargosa, Kern, Santa Ana, and Colorado River valleys. The species requires large patches of multi-layered riparian forest, with cottonwoods and willows. The presence of standing or flowing surface water under the riparian canopy is also preferred. Mesquite (*Prosopis* spp.) groves may also be used, but usually only when cottonwood-willow habitat is unavailable.	No	**Not Expected** The vegetation communities within the survey area do not provide the necessary cover and foraging habitat preferred by this species. In addition, the closest occurrence record for this species was documented approximately 7 miles southeast of the survey area and is possibly extirpated (Occurrence Number 73; CNDDB 2015).
Corynorhinus townsendii Townsend's big-eared bat	SSC G3G4 S2	Found throughout California, but the details of its distribution area not well known. Now considered uncommon in California. Details of its distribution are not well known. This species is found in all but subalpine and alpine habitats and may be found at any season throughout its range. Most abundant in mesic habitats. Requires caves, mines, tunnels, buildings, or other human-made structures for roosting.	No	**Not Expected** There is no suitable subalpine or alpine habitat within the survey area. In addition, no suitable roosting sites (e.g., caves, mines, tunnels) are present.
Cypseloides niger black swift	SSC G4 S2	Uncommon summer resident of California. Nesting habitat is restricted to behind or beside permanent or semi-permanent waterfalls, on perpendicular cliffs near water and in sea caves.	No	**Not Expected** There are no permanent or semi-permanent waterfalls, or perpendicular cliffs near water or in sea caves within the survey area.
Empidonax traillii extimus southwestern willow flycatcher	FE SE G5T2 S1	Uncommon summer resident in southern California primarily found in lower elevation riparian habitats occurring along streams or in meadows. The structure of suitable breeding habitat typically consists of a dense mid-story and understory and can also include a dense canopy. Nest sites are generally located near surface water or saturated soils. The presence of surface water, swampy conditions, standing or flowing water under the riparian canopy are preferred.	No	**Not Expected** There is no riparian habitat along streams or in meadows within the project site. Further, the nearest documented occurrence is about 4 miles northwest of the project site (Occurrence Number 44; CNDDB 2005).
Emys marmorata western pond turtle	SSC G3G4 S3	Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater. Found at elevations from sea level to over 5,900 feet amsl.	No	**Not Expected** There are no perennial water sources with abundant vegetation within the survey area.
Eumops perotis californicus western mastiff bat	SSC G5T4 S3S4	Primarily a cliff-dwelling species, roost generally under exfoliating rock slabs. Roosts are generally high above the ground, usually allowing a clear vertical drop of at least 10 feet below the entrance for flight. In California, it is most frequently encountered in broad open areas. Its foraging habitat includes dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas.	No	**Low** Suitable foraging and roosting habitat (oak woodland) is marginally present within the survey area. The nearest documented occurrence is about 1 mile to the west of the survey area and was documented in 1918 (Occurrence Number 56; CNDDB 2006).

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Falco peregrinus anatum American peregrine falcon	FP G4T4 S3S4	This species breeds and winters throughout California, with the exception of desert areas. Use a large variety of open habitats for foraging, including tundra, marshes, seacoasts, savannahs, grasslands, meadows, open woodlands, and agricultural areas. Sites are often located near rivers or lakes. Riparian areas, as well as coastal and inland wetlands, are also important habitats year-round for this species. The species breeds mostly in woodland, forest, and coastal habitats. The nest is typically a scrape or depression dug in gravel on a cliff ledge or on manmade structures, including skyscraper ledges, tall towers, and bridges. Within southern California, peregrine falcons are primarily found at coastal estuaries and inland oases where ever a food source is located.	No	**Not Expected** Suitable roosting and breeding habitats are not present within the survey area.
Lasionycteris noctivagans silver-haired bat	G5 S3S4	Primarily a coastal and montane forest dweller that feeds over streams, ponds, and open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Needs drinking water.	No	**Low** Suitable foraging habitat (streams) is present adjacent to the survey area. However, the nearest documented occurrence is about 9.5 miles northwest of the survey area (Occurrence Number 49; CNDDB 2007).
Lasiurus blossevillii western red bat	SSC G5 S3	Winter range includes western lowlands and coastal regions south of San Francisco Bay. There is migration between summer and winter ranges. Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests. Roosts primarily in trees, less often in shrubs. Roost sites are often found adjacent to streams, fields, or urban areas. Forages over grasslands, shrublands, open woodlands and forests, and croplands. Not found in desert areas.	No	**Low** Suitable foraging habitat (woodlands and streams) is marginally present within the survey area. However, the nearest documented occurrence is about 8 miles northeast of the survey area (Occurrence Number 120; CNDDB 2016).
Lasiurus cinereus hoary bat	G5 S4	Prefers open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for feeding. Found in broadleaved upland forest, cismontane woodland, lower montane coniferous forest, and north coast coniferous forest. Roosts in dense foliage of medium to large trees and feeds primarily on moths.	No	**Not Expected** Suitable roosting and breeding habitats are not present within the survey area.
Lasiurus xanthinus western yellow bat	SSC G5 S3	Uncommon in California, known only in Los Angeles and San Bernardino Counties. Occurs in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Prefers to roost and feed in, and near, palm oases and riparian habitats. Commonly found in the southwestern U.S. roosting in the skirt of dead fronds in both native and non-native palm trees.	No	**Low** Suitable roosting habitat (non-native palm trees) is present within the survey area. However, the nearest documented occurrence is about 8 miles northwest of the survey area (Occurrence Number 10; CNDDB 2004).
Nyctinomops macrotis big free-tailed bat	SSC G5 S3	Found in New Mexico, southern Arizona, and Texas. Rare in California. Records of this species are from urban areas of San Diego County. Prefers rugged, rocky terrain up to 8,000 feet amsl. Roosts in buildings, caves, and occasionally in holes in trees. Also roosts in crevices in high cliffs or rock outcrops.	No	**Low** Suitable roosting habitat (buildings) is present within the survey area. However, the nearest documented occurrence is about 8 miles southwest of the survey area (Occurrence Number 6; CNDDB 2005).

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Onychomys torridus ramona southern grasshopper mouse	SSC G5T3 S3	Common in arid desert habitats of the Mojave and southern Central Valley of California. Known elevation range is generally below 3,000 feet amsl. Little is known about habitat requirements; however, it is commonly found in scrub habitats with friable soils for digging in desert areas. It is believed that alkali desert scrub and desert scrub habitats are preferred, with somewhat lower densities expected in other desert habitats, including succulent shrub, wash, and riparian areas. Also occurs in coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats.	No	**Not Expected** Desert habitats are not present within the survey area.
Phrynosoma blainvillii coast horned lizard	SSC G3G4 S3S4	Occurs in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. Its elevational range extends up to 4,000 feet in the Sierra Nevada foothills and up to 6,000 feet in the mountains of southern California. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (e.g. fire, floods, unimproved roads, grazing lands, and fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Not Expected** Suitable habitat (oak woodland) is marginally present within the survey area. However, the survey area is heavily disturbed. Further, the nearest documented occurrence is about 3.5 miles southeast of the survey area (Occurrence Number 49; CNDDB 2012).
Polioptila californica californica coastal California gnatcatcher	FT SSC G4G5T2Q S2	Yearlong resident of sage scrub habitats that are dominated by California sagebrush (*Artemisia californica*). This species generally occurs below 750 feet amsl in coastal regions and below 1,500 feet amsl inland. Ranges from the Ventura County, south to San Diego County and northern Baja California and it is less common in sage scrub with a high percentage of tall shrubs. Prefers habitat with more low-growing vegetation.	No	**Not Expected** Sage scrub habitats are not present within the survey area.
Rana muscosa southern mountain yellow-legged frog	FE SE WL G1 S1	The species inhabits ponds, lakes, and streams at moderate to high elevations. Usually associated with montane riparian habitats in lodgepole pine (*Pinus contorta*), yellow pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), whitebark pine (*Pinus albicaulis*), and wet meadow vegetation types. Occupied alpine lakes usually have margins that are grassy or muddy and inhabit sandy or rocky shores at lower elevations. Streams utilized vary from rocky, high gradient streams with numerous pools, rapids, and small waterfalls to those with marshy edges and sod banks. Species seems to prefer streams of low gradient and slow or moderate flow with very small, shallow streams being less frequently used.	No	**Not Expected** Suitable habitats are not present within the survey area.
Riparia riparia bank swallow	ST G5 S2	Neotropical migrant found in riparian and other lowland habitats in California, west of the deserts. The species does not breed in southern California. During the summer, the species is restricted to riverbanks, creeks, seashores, and lakes with vertical banks, bluffs, and cliffs with fine-textured or sandy soils nearby for nesting.	No	**Not Expected** Suitable habitats are not present within the survey area.
Taricha torosa Coast Range newt	SSC G4 S4	Found in wet forests, oak forests, chaparral, and rolling grasslands. In southern California, it is found in drier chaparral, oak woodland, and grasslands.	No	**Not Expected** Suitable habitat (oak woodland) is marginally present within the survey area. However, the survey area is heavily disturbed. Further, the nearest documented occurrence is about 8 miles northwest of the survey area (Occurrence Number 10; CNDDB 2003).

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	Special-Status Rank*	Habitat Preferences and Distribution	Observed On-site	Potential to Occur
Taxidea taxus American badger	SSC G5 S3	Occupies a wide variety of habitats including dry, open grassland, sagebrush, and woodland habitats. Require dry, friable, often sandy soil to dig burrows for cover, food storage, and giving birth. Occasionally found in riparian zones and open chaparral with less than 50% plant cover.	No	**Not Expected** Suitable habitat (oak woodland) is marginally present within the survey area. However, the survey area is heavily disturbed. Further, the nearest documented occurrence is about 8 miles southwest of the survey area (Occurrence Number 291; CNDDB 2005).
Thamnophis hammondii two-striped garter snake	SSC G4 S3S4	Occurs in or near permanent fresh water, often along streams with rocky beds and riparian growth up to 7,000 feet amsl.	No	**Not Expected** Suitable habitat (permanent fresh water) is present adjacent to the survey area. However, this drainage has been converted to a concrete-lined channel. Further, the nearest documented occurrence is about 9 miles northeast of the survey area (Occurrence Number 168; CNDDB 2017).
Vireo bellii pusillus least Bell's vireo	FE SE G5T2 S2	Summer resident in southern California. Breeding habitat generally consists of dense, low, shrubby vegetation in riparian areas, and mesquite brushlands, often near water in arid regions. Early successional cottonwood-willow riparian groves are preferred for nesting. The most critical structural component of nesting habitat in California is a dense shrub layer that is 2 to 10 feet (0.6 to 3.0 meters) above ground. The presence of water, including ponded surface water or moist soil conditions, may also be a key component for nesting habitat.	No	**Not Expected** Riparian habitats are not present within the survey area.
SPECIAL-STATUS PLANT SPECIES				
Acanthoscyphus parishii* var. *parishii Parish's oxytheca	4.2 G4?T3T4 S3S4	Annual herb. Habitats include sandy or shale chaparral. Found at elevations ranging from 3,750 to 6,748 feet amsl. Blooming period is from June to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Arctostaphylos glandulosa* ssp. *gabrielensis San Gabriel manzanita	1B.2 G5T3 S3	Shrub. Occurs on rocky soils within chaparral habitats. Occurs at elevations ranging from 1,952 to 4,921 feet amsl. Blooms during the month of March.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Asplenium vespertinum western spleenwort	4.2 G4 S4	Fern. Found on rocky soils within chaparral, cismontane woodland, and coastal scrub habitat. Found at elevations ranging from 591 to 3,281 feet amsl. Blooming period is from February to June.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Astragalus brauntonii Braunton's milk-vetch	FE 1B.1 G2 S2	Perennial herb. Found in recently burned or disturbed areas, usually sandstone with carbonate layers in coastal scrub, chaparral, and valley and foothill grassland habitats. Found at elevations ranging from 13 to 2,100 feet amsl. Blooming period is from January to August.	No	**Not Expected** Coastal scrub, chaparral, and grassland habitats are not present within the survey area.
Atriplex serenana* var. *davidsonii Davidson's saltscale	1B.2 G5T1 S1	Annual herb. Occurs on alkaline soils within coastal bluff scrub and coastal scrub habitats. Grows in elevations ranging from 33 to 656 feet amsl. Blooming period is from April to October.	No	**Not Expected** Coastal bluff scrub and coastal scrub habitats are not present within the survey area.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Berberis nevinii Nevin's barberry	FE SE 1B.1 G1 S1	Shrub. Occurs on steep, north-facing slopes or in low-grade sandy washes in chaparral, cismontane woodland, coastal scrub, and riparian scrub. Found at elevations ranging from 899 to 2,707 feet amsl. Blooming period is from March to June.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Calochortus catalinae Catalina mariposa-lily	4.2 G3G4 S3S4	Perennial herb (bulb). Habitats include chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Found at elevations ranging from 49 to 2,297 feet amsl. Blooming period is from February to June.	No	**Not Expected** Chaparral, cismontane woodland, coastal scrub, and grassland habitats are not present within the survey area.
Calochortus plummerae Plummer's mariposa-lily	4.2 G4 S4	Perennial bulbiferous herb. Occurs on granitic and rocky soils within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley/foothill grassland. Grows in elevations ranging from 328 to 5,577 feet amsl. Blooming period is from May to July.	No	**Not Expected** Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland habitats are not present within the survey area.
Calochortus weedii* var. *intermedius intermediate mariposa-lily	1B.2 G3G4T2 S2	Perennial bulbiferous herb. Found in chaparral, coastal scrub, and valley and foothill grasslands in rocky or calcareous soils. Found at elevations ranging from 344 to 2,805 feet amsl. Blooming period is from May to July.	No	**Not Expected** Chaparral, coastal scrub, and grassland habitats are not present within the survey area.
Centromadia parryi* ssp. *australis southern tarplant	1B.1 G3T2 S2	Annual herb. Occurs in marshes and swamps (margins), valley and foothill grassland (vernally mesic), and vernal pools. Found at elevations ranging from 0 to 1,575 feet amsl. Blooming period is from May to November.	No	**Not Expected** Marshes and swamps, grassland, and vernal pool habitats are not present within the survey area.
Centromadia pungens* ssp. *laevis smooth tarplant	1B.1 G3G4T2 S2	Annual herb. Occurs in alkaline soils within chenopod scrub, meadows and seeps, playas, riparian woodland, and valley/foothill grassland habitats. Grows in elevation from 0 to 2,100 feet amsl. Blooming period is from April to September.	No	**Not Expected** Chenopod scrub meadows and seeps, playas, riparian woodland, and grassland habitats are not present within the survey area.
Chorizanthe parryi* var. *fernandina San Fernando Valley spineflower	ProposedTH SE 1B.1 G2T1 S1	Annual herb. Found in sandy soils within coastal scrub habitat and valley and foothill grassland habitats. Found at elevations ranging from 492 to 4,003 feet amsl. Blooming period is from April to July.	No	**Not Expected** Coastal scrub and grassland habitats are not present within the survey area.
Chorizanthe parryi* var. *parryi Parry's spineflower	1B.1 G3T2 S2	Annual herb. Occurs on sandy and/or rocky soils in chaparral, coastal sage scrub, and sandy openings within alluvial washes and margins. Found at elevations ranging from 951 to 3,773 feet amsl. Blooming period is from April to June.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Cladium californicum California saw-grass	2B.2 G4 S2	Perennial grasslike herb. Found in meadows and seeps, marshes and swamps (alkaline or freshwater). Found at elevations ranging from 197 to 5,249 feet amsl. Blooming period is from June to September.	No	**Not Expected** Meadows and seeps, and marsh and swamp habitats are not present within the survey area.
Clinopodium mimuloides monkey-flower savory	4.2 G3 S3	Perennial herb. Occurs on streambanks and mesic soils in chaparral and North Coast coniferous forest. Found at elevations ranging from 1,000 to 5,906 feet amsl. Blooming period is from June to October.	No	**Not Expected** The survey area is outside the known elevation range for this species.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	Special-Status Rank*	Habitat Preferences and Distribution	Observed On-site	Potential to Occur
Cuscuta obtusiflora* var. *glandulosa Peruvian dodder	2B.2 G5T4T5 SH	Annual herb or vine (parasitic). Found in freshwater marshes and swamps. Found at elevations ranging from 49 to 919 feet amsl. Blooming period is from July to October.	No	**Not Expected** Freshwater marsh and swamp habitats are not present within the survey area.
Diplacus johnstonii Johnston's monkeyflower	4.3 G4 S4	Annual herb. Found in lower montane coniferous forest (scree, disturbed areas, rocky or gravelly, roadside). Found at elevations ranging from 3,198 to 9,580 feet amsl. Blooming period is from May to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Dodecahema leptoceras slender-horned spineflower	FE SE 1B.1 G1 S1	Annual herb. Occurs on flood deposited terraces and washes in chaparral, coastal scrub, and alluvial fan sage scrub habitats. Found at elevations ranging from 1,181 to 2,690 feet amsl. Blooming period is from April to June.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Dudleya multicaulis many-stemmed dudleya	1B.2 G2 S2	Perennial herb. Often occurs on clay soils and around granitic outcrops in chaparral, coastal sage scrub, and grasslands. Found at elevations ranging from 0 to 2,592 feet amsl. Blooming period is from April to July.	No	**Not Expected** Chaparral, coastal sage scrub, and grassland habitats are not present within the survey area.
Galium angustifolium* ssp. *gabrielense San Antonio Canyon bedstraw	4.3 G5T3 S3	Perennial herb. Grows on granitic, sandy, or rocky soils within chaparral and lower montane coniferous forest. Found at elevations ranging from 3,937 to 8,694 feet amsl. Blooming period is from April to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Galium grande San Gabriel bedstraw	1B.2 G1 S1	Shrub. Occurs in broadleaf upland forest, chaparral, cismontane woodland, and lower montane coniferous forest habitats. Found at elevations ranging from 1,394 to 4,921 feet amsl. Blooming period is from January to July.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Galium johnstonii Johnston's bedstraw	4.3 G4 S4	Perennial herb. Preferred habitats include chaparral, riparian woodland, lower montane coniferous forest, pinyon and juniper woodland. Found at elevations ranging from 4,003 to 7,546 feet amsl. Blooming period is from June to July.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Helianthus nuttallii* ssp. *parishii Los Angeles sunflower	1A G5TH SH	Perennial rhizomatous herb. Found in marshes and swamps (coastal salt and freshwater). Found at elevations ranging from 33 to 5,003 feet amsl. Blooming period is from August to October.	No	**Not Expected** Marsh and swamp habitats are not present within the survey area.
Heuchera caespitosa urn-flowered alumroot	4.3 G3 S3	Perennial herb. Grows on rocky soils within cismontane woodland, lower montane coniferous forest, riparian forest, and upper montane coniferous forest. Found at elevations ranging from 3,789 to 8,694 feet amsl. Blooming period is from May to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Hordeum intercedens vernal barley	3.2 G3G4 S3S4	Annual herb. Habitat includes coastal dunes, coastal scrub, vernal pools, and valley/foothill grassland. Grows in elevations ranging from 16 to 3,281 feet amsl. Blooming period is from March to June.	No	**Not Expected** Coastal dune, coastal scrub, vernal pool, and grassland habitats are not present within the survey area.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	Special-Status Rank*	Habitat Preferences and Distribution	Observed On-site	Potential to Occur
Horkelia cuneata* var. *puberula mesa horkelia	1B.1 G4T1 S1	Perennial herb. Found on sandy or gravelly soils within chaparral, cismontane woodland, and coastal scrub habitats. Found at elevations ranging from 230 to 2,657 feet amsl. Blooming period is from February to September.	No	**Not Expected** Chaparral, cismontane woodland, and coastal scrub habitats are not present within the survey area.
Juglans californica southern California black walnut	4.2 G4 S4	Perennial deciduous tree. Found in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Found at elevations ranging from 164 to 2,953 feet amsl. Blooming period is from March to August.	No	**Not Expected** Chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats are not present within the survey area.
Lasthenia glabrata* ssp. *coulteri Coulter's goldfields	1B.1 G4T2 S2	Annual herb. Prefers playas, vernal pools, and coastal salt marshes and swamps. Found at elevations ranging from 3 to 4,003 feet amsl. Blooming period is from February to June.	No	**Not Expected** Playa, vernal pool, and coastal salt marsh and swamp habitats are not present within the survey area.
Lepechinia fragrans fragrant pitcher sage	4.2 G3 S3	Shrub. Occurs in chaparral habitats. Found at elevations ranging from 66 to 4,298 feet amsl. Blooming period is from March to October.	No	**Not Expected** Chaparral habitats are not present within the survey area.
Lepidium virginicum* var. *robinsonii Robinson's pepper-grass	4.3 G5T3 S3	Annual herb. Dry soils on chaparral and coastal sage scrub. Found at elevations ranging from 66 to 4,396 feet amsl. Blooming period is from January to July.	No	**Not Expected** Chaparral and coastal sage scrub habitats are not present within the survey area.
Lilium humboldtii* ssp. *ocellatum ocellated Humboldt lily	4.2 G4T4? S4?	Perennial bulbiferous herb. Found in openings within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats. Found at elevations ranging from 98 to 5,906 feet amsl. Blooming period is from March to August.	No	**Not Expected** Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland habitats are not present within the survey area.
Linanthus concinnus San Gabriel linanthus	1B.2 G2 S2	Annual herb. Grows in rocky openings within chaparral, lower montane coniferous forest, and upper montane coniferous forest. Found at elevations ranging from 4,987 to 9,186 feet amsl. Blooming period is from April to July.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Linanthus orcuttii Orcutt's linanthus	1B.3 G3 S2	Annual herb. Found in openings within chaparral, lower montane coniferous forest, and pinyon and juniper woodland habitats. Found at elevations ranging from 3,002 to 7,037 feet amsl. Blooming period is from May to June.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Muhlenbergia californica California muhly	4.3 G4 S4	Perennial grass (rhizomatous). Found in mesic areas, meadows, seeps, and streambanks within chaparral, coastal scrub, and lower montane coniferous forest. Found at elevations ranging from 328 to 6,562 feet amsl. Blooming period is from June to September.	No	**Not Expected** Mesic areas, meadows, seeps, and streambanks within chaparral, coastal scrub, and lower montane coniferous forest habitats are not present within the survey area.
Navarretia prostrata prostrate vernal pool navarretia	1B.1 G2 S2	Annual herb. Occurs in mesic sites and on alkaline soils in coastal scrub, valley and foothill grassland, vernal pool, meadows, and seeps. Known elevations range from 5 to 4,055 feet amsl. Blooming period is from April to July.	No	**Not Expected** Mesic sites and alkaline soils in coastal scrub, grassland, vernal pool, meadow, and seep habitats are not present within the survey area.
Phacelia hubbyi Hubby's phacelia	4.2 G4 S4	Annual herb. Grows on gravelly, rocky, talus soils within chaparral, coastal scrub, and valley and foothill grassland habitats. Found at elevations ranging from 0 to 3,281 feet amsl. Blooming period is from April to July.	No	**Not Expected** Gravelly, rocky, talus soils within chaparral, coastal scrub, and grassland habitats are not present within the survey area.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Phacelia stellaris Brand's star phacelia	1B.1 G1 S1	Annual herb. Found in coastal dunes and coastal scrub habitats. Found at elevations ranging from 3 to 1,312 feet amsl. Blooming period is from March to June.	No	**Not Expected** Coastal dune and coastal scrub habitats are not present within the survey area.
Pseudognaphalium leucocephalum white rabbit-tobacco	2B.2 G4 S2	Perennial herb. Found on sandy and gravelly soils within chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Found at elevations ranging from 0 to 6,890 feet amsl. Blooming period is from July to December.	No	**Not Expected** Sandy and gravelly soils within chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats are not present within the survey area.
Quercus durata* var. *gabrielensis San Gabriel Mountains leather oak	4.2 G4T3 S3	Shrub. Habitats include chaparral and cismontane woodland habitats. Found at elevations ranging from 1,476 to 3,281 feet amsl. Blooming period is from April to May.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Quercus engelmannii Engelmann oak	4.2 G4T3 S3	Perennial deciduous tree. Occurs in chaparral, cismontane woodland, riparian woodland, and valley/foothill grassland. Grows in elevations ranging from 160 to 4,275 feet amsl. Blooming period is from March to June.	No	**Not Expected** Chaparral, cismontane woodland, riparian woodland, and grassland habitats are not present within the survey area.
Ribes divaricatum* var. *parishii Parish's gooseberry	1A G5TX SX	Shrub. Found in riparian woodland and other riparian habitats. Found at elevations ranging from 213 to 984 feet amsl. Blooming period is from February to April.	No	**Not Expected** Riparian woodland and other riparian habitats are not present within the survey area.
Romneya coulteri Coulter's matilija poppy	4.2 G4 S4	Perennial herb (rhizomatous). Habitats include chaparral and coastal scrub. Grows at elevations ranging from 66 to 3,937 feet amsl. Blooming period is from March to July.	No	**Not Expected** Chaparral and coastal scrub habitats are not present within the survey area.
Rupertia rigida Parish's rupertia	4.3 G4 S4	Perennial herb. Grows in chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, pebble (pavement) plain, and valley and foothill grassland habitats. Found at elevations ranging from 2,297 to 8,202 feet amsl. Blooming period is from June to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Scutellaria bolanderi* ssp. *austromontana southern mountains skullcap	1B.2 G4T3 S3	Perennial rhizomatous herb. Found on mesic soils within chaparral, cismontane woodland, and lower montane coniferous forest habitats. Found at elevations ranging from 1,394 to 6,562 feet amsl. Blooming period is from June to August.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Senecio astephanus San Gabriel ragwort	4.3 G3 S3	Perennial herb. Occurs on rocky slopes within coastal bluff scrub and chaparral habitats. Found at elevations ranging from 1,312 to 4,921 feet amsl. Blooming period is from May to July.	No	**Not Expected** The survey area is outside the known elevation range for this species.
Sidalcea neomexicana salt spring checkerbloom	2B.2 G4 S2	Perennial herb. Found on alkaline and mesic soils within chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas. Found at elevations ranging from 49 to 5,020 feet amsl. Blooming period is from March to June.	No	**Not Expected** Alkaline and mesic soils within chaparral, coastal scrub, lower montane coniferous forest, and Mojavean desert scrub habitats are not present within the survey area. Additionally, the survey area is not located on a playa.
Symphyotrichum greatae Greata's aster	1B.3 G2 S2	Perennial rhizomatous herb. Found on mesic soils within broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and riparian woodland habitats. Found at elevations ranging from 984 to 6,594 feet amsl. Blooming period is June to October.	No	**Not Expected** The survey area is outside the known elevation range for this species.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
Thelypteris puberula* var. *sonorensis Sonoran maiden fern	2B.2 G5T3 S2	Fern (rhizomatous). Found in meadows and seeps along streams and other seepage areas. Found at elevations ranging from 164 to 2,001 feet amsl. Blooming period is from January to September.	No	**Not Expected** Meadow and seep habitats along streams and other seepage areas are not present within the survey area.
SPECIAL-STATUS VEGETATION COMMUNITIES				
CNDDB/Holland (1986) Open Engelmann Oak Woodland **MCV (1995)** Engelmann Oak Series **NVCS (2009)** *Quercus engelmannii* Woodland Alliance	G3 S3	Found at elevations ranging from 164 to 4,002 feet amsl on raised stream terraces along stream corridors, valley bottoms, and gentle lower slopes. Engelmann oak (*Quercus engelmannii*) is a dominant or co-dominant in the tree canopy with southern California black walnut (*Juglans californica*), coast live oak (*Quercus agrifolia*), and California black oak (*Quercus kelloggii)*. Trees are less than 60 feet tall; canopy is open to closed. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy.	No	**Absent** This vegetation community does not occur within the project site.
CNDDB/Holland (1986) Riversidian Alluvial Fan Sage Scrub **MCV (1995)** Scalebroom Series **NVCS (2009)** *Lepidospartum squamatum* intermittently flooded Shrubland Alliance	G3 S3	Found at elevations ranging from 164 to 4,922 feet amsl on intermittently or rarely flooded, low-gradient alluvial deposits along streams, washes, and fans. Scalebroom (*Lepidospartum squamatum*) is dominant, co-dominant, or conspicuous in the shrub canopy with burrobrush (*Ambrosia salsola*), California sagebrush, mule fat, bladderpod (*Cleome isomeris*), California cholla (*Cylindropuntia californica*), brittlebush (*Encelia farinosa*), thick leaved yerba santa (*Eriodictyon crassifolium*), hairy yerba santa (*Eriodictyon trichocalyx*), California buckwheat (*Eriogonum fasciculatum*), chaparral yucca (*Hesperoyucca whipplei*), deerweed (*Acmispon glaber*), laurel sumac (*Malosma laurina*), prickly-pear cactus (*Opuntia littoralis*), lemonade berry (*Rhus integrifolia*), sugar bush (*Rhus ovata*), skunkbrush (*Rhus aromatica*), and poison oak (*Toxicodendron diversilobum*). Emergent trees or tall shrubs may be present at low cover, including mountain mahogany (*Cercocarpus betuloides*), southern California black walnut, California juniper (*Juniperus californica*), California sycamore, Fremont cottonwood, or black elderberry (*Sambucus nigra*). Shrubs are less than 7 feet tall; canopy is open to continuous, and two tiered. Herbaceous is layer variable and may be grassy.	No	**Absent** This vegetation community does not occur within the project site.
CNDDB/Holland (1986) Southern Coast Live Oak Riparian Forest **MCV (1995)** Coast Live Oak Series **NVCS (2009)** *Quercus agrifolia* Woodland Alliance	G5 S4	Found at elevations ranging from sea level to 3,937 feet amsl in alluvial terraces, canyon bottoms, stream banks, slopes, and flats, Soils are deep, sandy or loamy with high organic matter. Coast live oak is a dominant or co-dominant in the tree canopy with bigleaf maple (*Acer macrophyllum*), box elder (*Acer negundo*), madrone (*Arbutus menziesii*), southern California black walnut, California sycamore, Fremont cottonwood, blue oak (*Quercus douglasii*), Engelmann oak, California black oak, valley oak (*Quercus lobata*), arroyo willow (*Salix lasiolepis*), and California bay (*Umbellularia californica*). Trees are less than 98 feet tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy.	No	**Absent** This vegetation community does not occur within the project site.

Table D-1: Potentially Occurring Special-Status Biological Resources

Scientific Name Common Name	**Special-Status Rank***	**Habitat Preferences and Distribution**	**Observed On-site**	**Potential to Occur**
<u>CNDDB/Holland (1986)</u> Southern Sycamore Alder Riparian Woodland **<u>MCV (1995)</u>** California Sycamore Series **<u>NVCS (2009)</u>** *Platanus racemosa* Woodland Alliance	G3 S3	Found at elevations ranging from sea level to 7,874 feet amsl in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. Soils are rocky or cobbly alluvium with permanent moisture at depth. California sycamore is a dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), southern California black walnut, Fremont cottonwood, coast live oak, valley oak, narrowleaf willow (*Salix exigua*), Gooding's willow (*Salix gooddingii*), polished willow (*Salix laevigata*), arroyo willow, yellow willow (*Salix lutea*), Peruvian pepper tree (*Schinus mole*), and California bay.	No	**Absent** This vegetation community does not occur within the project site.
<u>CNDDB/Holland (1986)</u> Walnut Forest **<u>MCV (1995)</u>** California Walnut Series **<u>NVCS (2009)</u>** *Juglans californica* Woodland Alliance	G3 S3.2	Found at elevations ranging from 492 to 2,952 feet amsl in riparian corridors, but most stands cover all hillslopes. Southern California black walnut is dominant or co-dominant in the tree canopy with white alder, two petaled ash (*Fraxinus dipetala*), toyon (*Heteromeles arbutifolia*), coast live oak, valley oak, polished willow, arroyo willow, black elderberry, and California bay. Trees are less than 50 feet tall; canopy is open to continuous. Shrub layer is sparse to intermittent. Herbaceous layer is sparse or grassy.	No	**Absent** This vegetation community does not occur within the project site.

* **<u>U.S. Fish and Wildlife Service (USFWS)</u>**

FE Endangered – any species which is in danger of extinction throughout all or a significant portion of its range.

FT Threatened – any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

<u>California Department of Fish and Wildlife (CDFW)</u>

SE Endangered – any native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

ST Threatened – any native species or subspecies of bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required under the California Endangered Species Act.

FP Fully Protected – any native species or subspecies of bird, mammal, fish, amphibian, or reptile that were determined by the State of California to be rare or face possible extinction.

SSC Species of Special Concern – any species, subspecies, or distinct population of fish, amphibian, reptile, bird, or mammal native to California that currently satisfies one or more of the following criteria:

- is extirpated from California or, in the case of birds, in its primary seasonal or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed.
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; or
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

WL Watch List - taxa that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

California Native Plant Society (CNPS) California Rare Plant Rank

1B Plants rare, threatened, or endangered in California and elsewhere.

2B Plants rare, threatened, or endangered in California but more common elsewhere.

4 Plants of limited distribution – Watch List.

Threat Ranks

.2 Moderately threatened in California (20 to 80 percent of occurrences threatened/moderate degree and immediacy of threat).

.3 Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known).

NatureServe Conservation Status Rank

The Global Rank (G#) reflects the overall condition and imperilment of a species throughout its global range. The Infraspecific Taxon Rank (T#) reflects the global situation of just the subspecies or variety. The State Rank (S#) reflects the condition and imperilment of an element throughout its range within California. (G#Q) reflects that the element is very rare but there are taxonomic questions associated with it; the calculated G rank is qualified by adding a Q after the G#). Adding a ? to a rank expresses uncertainty about the rank.

T1 Critically Imperiled – At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2/T2 Imperiled— At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3/T3 Vulnerable— At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4/T4 Apparently Secure— Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 Secure – Common; widespread and abundant.

S1 Critically Imperiled – Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the State.

S2 Imperiled – Imperiled in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or State.

S3 Vulnerable – Vulnerable in the State due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.

CRAIG CROTTY
ARBOR CULTURE LLC

March 17, 2015

Larissa De La Cruz
Associate Planner
City of San Gabriel
626.308.2806 ext. 4625
Ldelacruz@sgch.org

RE: Observations and comments regarding trees located at 235 S. Arroyo Drive.

ARBORIST STATEMENT

Existing trees at a proposed condominium development located at 235 S. Arroyo Drive are observed in this report. According to the conceptual landscape design submitted, all site trees are to be removed for the new development, except one Oak tree.

The site includes a triangular parcel of vacant land on the east side of the Arroyo Drive storm channel at 235 S Arroyo Dr. and a larger parcel of land on the west side of the channel. The larger parcel is mostly vacant land but also has a residential structure that will be removed. The larger parcel is currently accessed from the south terminus of Hampton Court. A bridge access from Arroyo Drive is proposed as part of the project, eliminating the Hampton Court entry.

Most of the trees on these parcels are unmaintained and naturalized. A few are exceptional in quality, having maintained good health and structure, while others are in poor condition. *Mature* and *Landmark* trees as defined in the City of San Gabriel ordinance are identified and assessed for condition and proposed impact. Dead trees, fruit trees and palms are excluded from the discussion.

At least four trees within the site should be considered for retention:

- #3 California Pepper (53 inches circumference) is located in the Arroyo Dr. triangle/proposed landscape encroachment could be altered.
- #6 Eucalyptus, White Ironbark (three trunks estimated at 56-47-31 in. cir.) is located at the edge of the channel in the Arroyo Dr. triangle/proposed landscape encroachment could be altered.
- #10 Coast Live Oak located along the north property boundary/poor health due to previous construction encroachment. Cut slopes and structures should be kept outside the tree dripline if this tree is to be protected.
- #43 Coast Live Oak located in the northwest corner/construction of a courtyard beneath this tree is proposed. Construction should be kept outside the tree dripline.

Three off-site but adjacent bordering trees, should be protected:

- #9 Tree of Heaven- located at the Hampton Ct. terminus.
- #38 Coast live Oak ï located near the south property corner.
- #39 Coast live Oak ï located along the west boundary.

The property parcels are irregular in shape; there are no observed survey markers identifying property corners or delineating boundary lines, thus tree locations are estimated as best as possible on the Tree Plan. Several trees located adjacent to the site, but not within the boundaries, are also included. The trees are identified by species, measured for trunk diameter, estimated height, and field tagged with corresponding numbers on the Tree Plan.

Trees proposed for removal of a specie, size, health and structural condition, or aesthetically viable enough to consider mitigation replacement add up to a total of 408 diameter inches. This number excludes invasive species, very poor condition, and off-site or trees that might be retained.

Mitigation Analysis

If the project is approved, a total of 408 desirable and viable diameter inches of trees are to be removed as a result of this project. Thus a total of:

- 204-2 inch diameter trees, or
- 136-3 inch diameter trees, would replace that which is to be removed.

A 2 inch diameter tree is roughly equal to a 24 inch box container size; likewise a 3 inch diameter tree is roughly equal to a 36 inch box container. For greater impact at the time of installation, larger box trees should be included. The 36 inch box (+-3 in. dia. trunk) is a good recommended size, but larger box sizes could be considered for the most outstanding visibility locations. This site would not accommodate this quantity of mitigation trees, thus trees could be installed at sites throughout the City or a replacement dollar value could be donated to a City tree fund.

Craig Crotty
Arbor Culture LLC

Supplemental Information:

- Photos
- Field Data (six pages)
- Tree Plan

This property consists of two parcels. This photo shows the S. Arroyo Dr. frontage where Stone Pine #1 has uprooted but continues to grow. This tree is proposed for removal.

Calif. Pepper #3 (arrow) is located near the Arroyo storm channel and is worthy of preservation. #2 Mulberry tree is in poor condition, shown in the foreground, while invasive Tree of Heaven trees are located throughout the site and should be removed.

#6 Multi trunk Eucalyptus is located near the edge of the channel. This tree is one of two trees worth preserving in the Arroyo parcel. It appears to be located beyond impact from the proposal.

The other trees in this Arroyo section are poor quality due to structure and health (Stone Pine, Mulberry) or of an undesirable invasive species (#4-#5-#7-#8 Tree of Heaven). Palms, yuccas, fruit trees, and dead trees are excluded from consideration.

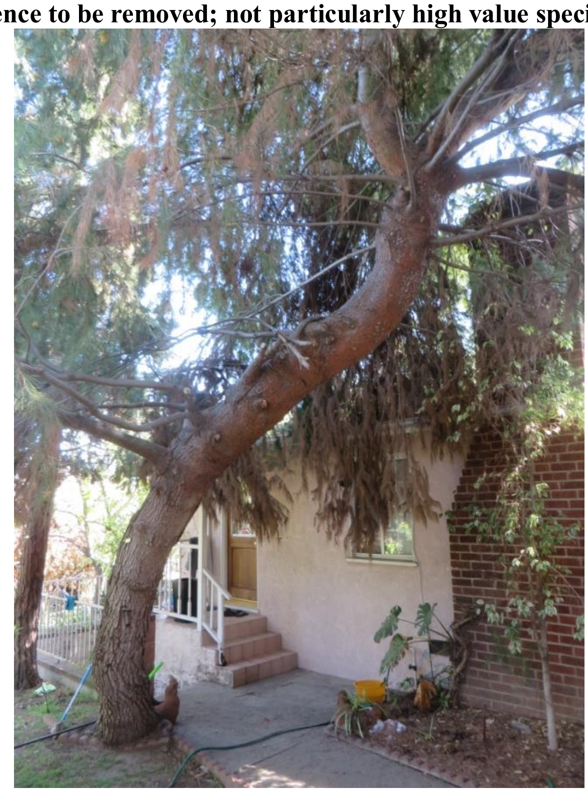
The west parcel existing entry is shown at the terminus of Hampton Court.

#9 Tree of Heaven is a large tree located just outside the site to remain.

#10 Coast Live Oak is to remain, but in poor condition. Construction should be held back to the dripline.

Mulberry trees #11 and #12 are in fair condition. Remove due to encroachment.

#13 Western Red Cedar (left) and #14 Northfolk Island Pine (right) are located in the yard above the existing residence to be removed; not particularly high value specimens.



#15 Aleppo Pine is in poor structural condition; located over residence.

#16 Western Red Cedar is in fair condition; proposed removal.

#17 Aleppo Pine is located below the residence near the storm channel. Landmark size in fair condition; proposed removal.

#18 Olive tree, located south of the residence, in fair condition to be removed.

#19 California Pepper adjacent the storm channel to be removed.

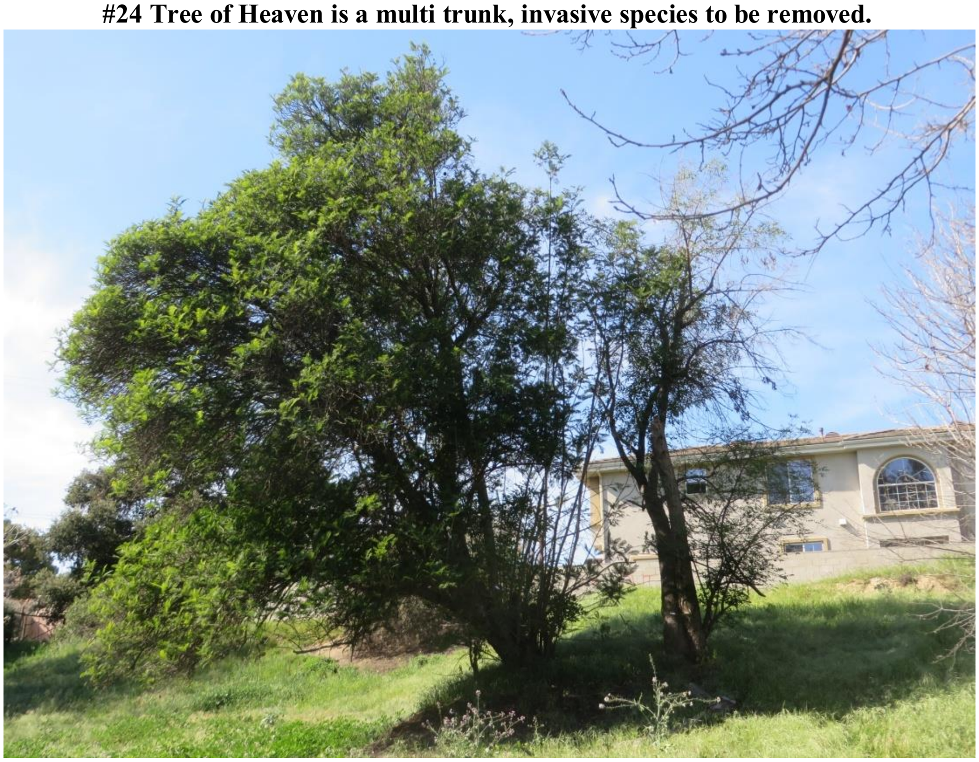
#20 Mulberry is in poor condition; to be removed.

#21 Eucalyptus is a landmark size tree in fair condition; proposed removal.

#22 Mulberry is in very poor condition; to be removed.

#23 Mulberry is in fair condition; to be removed.

#24 Tree of Heaven is a multi trunk, invasive species to be removed.



#25 Ash (right) poor condition and #26 Jacaranda fair condition are proposed removals.

#27 Ash (right) is a young volunteer and #28 Calif. Pepper is large and structurally poor condition tree proposed for removal. Located near the center of the lot.

#29 Eucalyptus is a large leaning tree in fair/poor condition to be removed. Locate near the channel.

#30 Calif. Pepper is a sprawling poor structure tree located near the channel. Removal proposed.

#31 Eucalyptus is a leaning poor structure tree adjacent the channel. Removal proposed.

#32 Eucalyptus is a poor condition tree to be removed. Photo looks northwest.

Eucalyptus #33 and #34 (right) are fair to poor condition trees located adjacent the channel and are to be removed.

#35 Coast Live Oak is a young tree at the edge of the channel. Proposed removal.

#36 Eucalyptus (right) and #37 Tree of Heaven are shown looking north. Proposed removal.

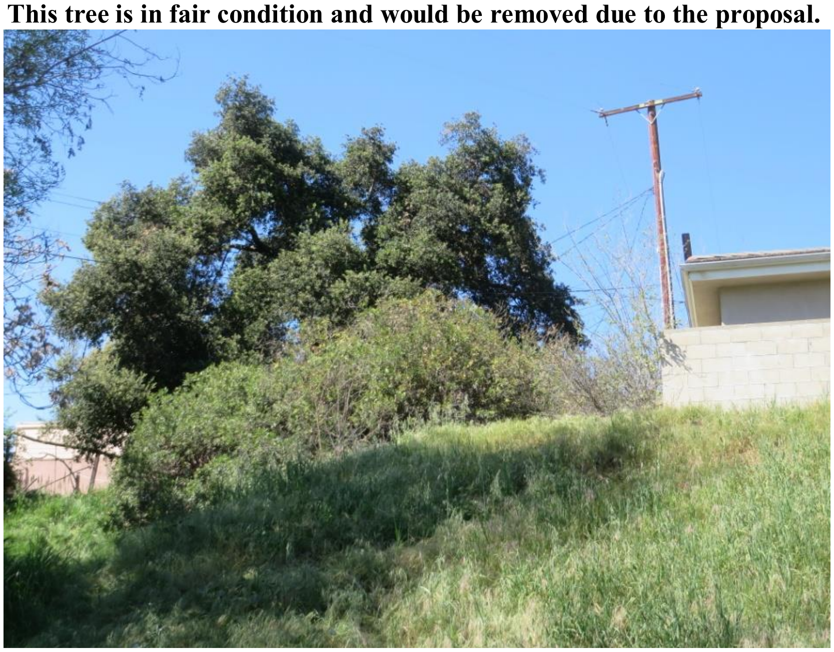
#38 Coast Live Oak may be located just outside the south corner. The exact location is unknown due to lack of survey markers. This tree should be fenced at the dripline to protect it during site work. Looking east.

#39 Coast Live Oak-location is estimated outside the west property boundary. The exact location is unknown due to lack of survey markers and unclear boundary lines. This tree should be fenced at the interface with project site work. Photo looks northwest.

#40 Coast Live Oak is located west of Jacaranda #26 at the edge of a steep slope. This tree is in poor condition and would be removed due to the proposal.

#41 Coast Live Oak is located above Oak #40 at the top of slope (arrow). Oak #40 is at left. This is a young tree in good condition; it would be removed due to the proposal.

#42 Ash is located along the top of slope northwest from Oak #41.
This tree is in fair condition and would be removed due to the proposal.



#43 Coast Live Oak is located at the north west end of the property. This is a landmark Oak that should be protected by a fence at the dripline. Grading and construction should be kept outside the dripline.

#43 Oak is shown from the neighbor's parking lot, looking south.

APPENDIX D
Cultural Resources Assessment

Arroyo Village Residential Condominium Project

Phase I Cultural Resources Assessment

prepared for

City of San Gabriel
425 South Mission Drive
San Gabriel, California 91776
Contact: Matt Chang, Senior Planner

prepared by

Rincon Consultants, Inc.
250 East 1st Street, Suite 301
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June 2019

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
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Executive Summary

The City of San Gabriel (City) retained Rincon Consultants, Inc. (Rincon) to conduct a phase I cultural resources assessment for the Arroyo Village Residential Condominium Project (project) in the city of San Gabriel, Los Angeles County, California. The project consists of the development of approximately 1.12 acres and is located at 235 South Arroyo Drive (Assessor's Parcel Numbers [APN] 5346-009-008, 5346-009-010, 5346-011-001, 5346-011-004, and 5346-011-006).The purpose of this report is to document the tasks Rincon conducted; specifically, a cultural resources records search, Native American outreach, historical imagery review, literature review and research, and field surveys. This study has been completed in accordance with the requirements of the California Environmental Quality Act (CEQA) and the City of San Gabriel's Historic Preservation and Cultural Resource Ordinance (HPCRO). The City is acting as the lead CEQA agency for the project.

The results of the study indicate two historic-period resources are on the project site. These include one historic-period residential building on the northeast portion of the project site, and the Alhambra Wash, which traverses the project site in a northeast to southeast direction. Both resources were evaluated by Rincon and recommended ineligible for listing in the National Register of Historic Places, the California Register of Historical Resources, or as a historic landmark in the City of San Gabriel; as a result, neither is considered a historical resource for the purposes of CEQA.

No other cultural resources were identified on the project site or in the immediate vicinity.

Rincon recommends a finding of ***no impact to historical resources*** under CEQA. The project site's proximity to the Mission District increases the potential for archaeological resources to be present on site. Therefore Rincon recommends a finding of ***less than significant impact to archaeological resources with mitigation incorporated*** for the project.

Rincon recommends the following measure as a standard best management practice in the event of an unanticipated discovery of cultural resources during project construction. The project is also required to adhere to regulations regarding the unanticipated discovery of human remains, detailed below.

Worker's Environmental Awareness Program

A qualified archaeologist should be retained to conduct a Worker's Environmental Awareness Program (WEAP) training on archaeological sensitivity for all construction personnel prior to the commencement of any ground-disturbing activities. The training should be conducted by an archaeologist who meets or exceeds the Secretary of Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983). Archaeological sensitivity training should include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find.

Unanticipated Discovery of Cultural Resources

If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service [NPS] 1983) should be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work, such as data recovery excavation, Native American consultation, and archaeological monitoring, may be warranted to mitigate any significant impacts.

Unanticipated Discovery of Human Remains

If human remains are found, existing regulations outlined in the State of California Health and Safety Code Section 7050.5 state that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resource Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of being granted access and provide recommendations as to the treatment of the remains to the landowner.

1 Introduction

The City of San Gabriel (City) retained Rincon Consultants, Inc. (Rincon) to conduct a phase I cultural resources assessment for the Arroyo Village Residential Condominium Project (project) in San Gabriel, Los Angeles County, California. This report documents the tasks Rincon conducted as part of the cultural resource assessment: a records search, Native American scoping, historical imagery review, and a pedestrian field survey. This study has been completed in accordance with the requirements of the California Environmental Quality Act (CEQA) and the City of San Gabriel's Historic Preservation and Cultural Resource Ordinance (HPCRO). The City is acting as the lead CEQA agency for the project.

1.1 Project Location and Description

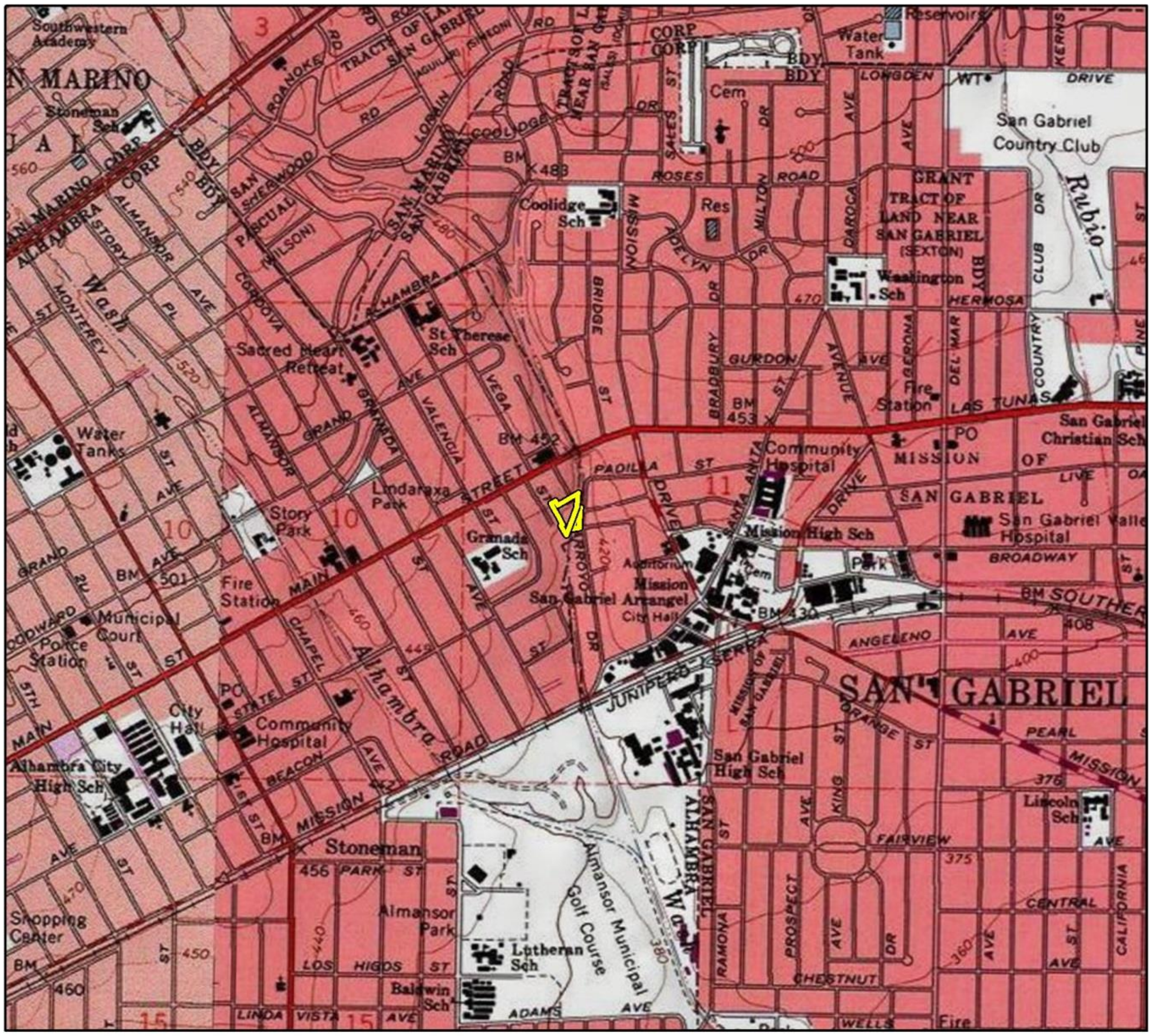
The project site is located in in the San Gabriel Valley of Los Angeles County approximately eight miles east of downtown Los Angeles and is depicted on the *El Monte, California*, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1). The project site consists of approximately 1.12 acres at 235 South Arroyo Drive (Assessor's Parcel Numbers [APN] 5346-009-008, 5346-009-010, 5346-011-001, 5346-011-004, and 5346-011-006). Regional access to the project site is provided via the San Bernardino Freeway (Interstate 10) or the Foothill Freeway (Interstate 210). Local access to the project site is provided by Arroyo Drive. The project site is bounded by residential uses on all sides with residential and parking to the north, the Alhambra Wash to the east, and vacant land associated with the Alhambra Channel and residential uses to the south (Figure 2).

The project would involve the demolition of the existing on-site single-family residential building and construction of a new four-story residential building encompassing 41 condominium units totaling approximately 55, 000 square feet and an underground parking structure totaling approximately 36,000 square feet. Exterior building finishes will incorporate architectural elements associated with the Spanish Colonial architecture used throughout San Gabriel since the eighteenth century. Construction of a vehicular bridge with pedestrian walkway is planned at the southern portion of the project site over the Alhambra Wash, providing access to the project from South Arroyo Drive. The project will include approximately 30,654 square feet of private and common residential open space.

1.2 Personnel

Rincon Principal and Senior Archaeologist Christopher Duran, MA, a Registered Professional Archaeologist (RPA), and Archaeologist and Project Manger Breana Campbell-King, MA, RPA managed this cultural resources study. Mr. Duran meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology (NPS 1983). Archaeologist and Project Manager Tricia Dodds, MA, RPA performed the cultural resources records search, Archaeologist Sun Min Choi conducted the field survey, and Archaeologist Lindsay Porras, MA, RPA, completed the Native American scoping and aerial imagery review and is the primary author of this report. Architectural Historian Alexandra Madsen, MA completed a site visit of and evaluated historic-era resources in the project area. Geographic Information Systems Analyst Erik Holtz prepared the figures in this report. Principal Shannon Carmack reviewed this report for quality control.

Figure 1 Project Location



Imagery provided by National Geographic Society, Esri and its licensors © 2019. El Monte Quadrangle. T01S R12W S11. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may havechanged since the original topographic map was assembled.

Project Location

0 1,000 2,000 Feet

N

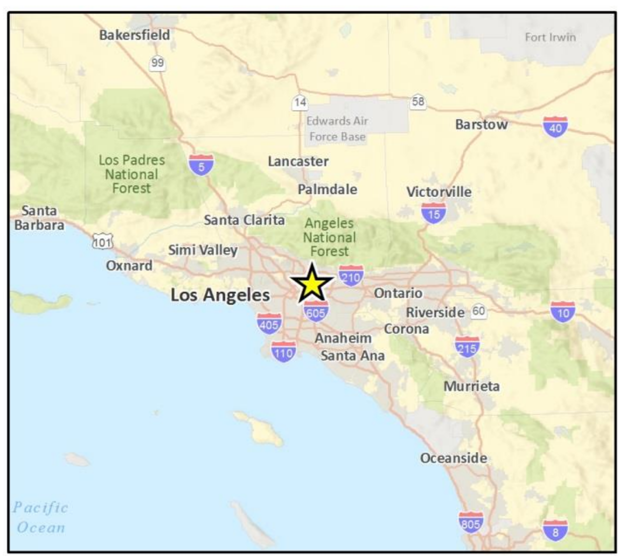


Figure 2 Project Site

Imagery provided by Microsoft Bing and its licensors © 2019.

2 Regulatory Setting

This section discusses state and local laws, ordinances, regulations, and standards governing cultural resources to which the project should adhere before and during implementation.

2.1 National Register of Historic Places

The NRHP was established by the National Historic Preservation Act of 1966 as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (CFR 36 CFR 60.2). The NRHP recognizes properties significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

- **Criterion A.** It is associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B.** It is associated with the lives of persons who are significant in our past.
- **Criterion C.** It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.
- **Criterion D.** It has yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting these criteria, a property must retain historic integrity, defined in National Register Bulletin 15 as the "ability of a property to convey its significance" (National Park Service 1990). To assess integrity, the National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity. To retain integrity, a property must possess several, if not all, of these seven qualities, defined in the following manner in National Register Bulletin 15:

- Location – the place where the historic property was constructed or the place where the historic event occurred
- Design – the combination of elements that create the form, plan, space, structure, and style of a property
- Setting – the physical environment of a historic property
- Materials – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property
- Workmanship – the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory
- Feeling – a property's expression of the aesthetic or historic sense of a particular period of time
- Association – the direct link between an important historic event or person and a historic property

2.2 State Regulations

California Environmental Quality Act

CEQA requires a lead agency to determine whether a project may have a significant effect on historical resources (Public Resources Code [PRC], Section 21084.1) or tribal cultural resources (PRC Section 21074[a][1][A]-[B]). A historical resource is one listed or determined to be eligible for listing in the California Register of Historical Resources (CRHR); a resource included in a local register of historical resources; or an object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be *historically significant* (State CEQA Guidelines, Section 15064.5[a][1-3]).

A resource shall be considered *historically significant* if it meets any of the following criteria:

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
2) Is associated with the lives of persons important to our past
3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
4) Has yielded, or may be likely to yield, information important in prehistory or history

If it can be demonstrated that a project will cause damage to a *unique archaeological resource*, the lead agency may require reasonable efforts be made to allow any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a], [b]).

PRC Section 21083.2(g) defines a *unique archaeological resource* as an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
2) Has a special and particular quality such as being the oldest of its type or the best available example of its type
3) Is directly associated with a scientifically recognized important prehistoric or historic event or person

Assembly Bill 52

As of July 1, 2015, California Assembly Bill 52 (AB 52) was enacted and expands CEQA by defining a new resource category called tribal cultural resources (TCR). AB 52 establishes that "a project with an effect that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states that the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a TCR, when feasible (PRC Section 21084.3).

PRC Section 21074(a)(1)(A) and (B) defines TCRs as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and requires that they meet either of the following criteria:

1) Listed or eligible for listing in the CRHR, or in a local register of historical resources, as defined in PRC Section 5020.1(k)
2) 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 PRC Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe

AB 52 also establishes a formal consultation process for California tribes regarding TCRs that must be completed before a CEQA document can be certified. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed within the jurisdiction of the lead agency.

2.3 City of San Gabriel Historic Preservation and Cultural Resource Ordinance

The City of San Gabriel (City) has a long tradition of recognizing cultural resources and codifying regulations for their identification, documentation, and management. In 1965, the City adopted one of the earliest historic preservation ordinances in Los Angeles County. In 1994, the City passed a resolution recognizing the Gabrielino-Tongva Nation as "the aboriginal tribe of the Los Angeles Basin" (City of San Gabriel 2004:CR-5). In May 2004, the City adopted updates to its General Plan, including Chapter 11: Cultural Resources: A Heritage Worth Preserving. Chapter 11 of the General Plan provides an overview of the City's priorities and objectives for cultural resources, and addresses both built environment resources and cultural resources relating to the Native American community.

In August 2017, the San Gabriel City Council adopted an updated Historic Preservation and Cultural Resources Ordinance (HPCRO). Codified in Chapter 153 of the San Gabriel Municipal Code, the HPCRO established the San Gabriel Register of Cultural Resources as well as new eligibility criteria for local-level designation of cultural resources. Given the importance of cultural resources in the City, the HPCRO also codifies standards and requirements for the identification, documentation, and management of cultural resources, as well as requires the review and approval of studies relating to cultural resources within the City.

2.3.1 Designation Criteria for Historic Landmarks

Section 153.607 of the HPCRO refers to cultural resources as *historic landmarks*, and outlines eligibility criteria for their listing on the San Gabriel Register of Cultural Resources. The HPCRO defines a *historic landmark* as a property, site, public art, park, cultural landscape, or natural feature which has maintained its integrity and meets one of the following eligibility criteria:

1) It is or was once associated or identified with important events or broad patters of development that have made a significant contribution to the cultural, architectural, social historical, economic, and political heritage of the city, region, state, or nation;
2) It is or was once associated with an important person or persons who made a significant contribution to the history, development, and/or cultural of the city, region, state, or nation;

3) It embodies the distinctive characteristics of a style, type, period, or method of construction, represents the work of a master, or possesses high artistic or aesthetic values, or it represents one of the last and best remaining examples of an architectural type of style in a neighborhood or the city that was once common but is increasingly rare; or
4) It has yielded or has the potential to yield information important to the prehistory or history of the city, region, state, or nation (City of San Gabriel 2017:15).

2.3.2 Archaeological and Native American Cultural Resources

Further, the City has developed procedures for the identification, documentation and management of archaeological and Native American cultural resources on properties proposed for development and/or demolition which are:

1) Listed on the San Gabriel Register of Cultural Resources;
2) Listed on the CRHR or NRHP;
3) Determined by the Director of the Community Development Department or his/her designee or the State Historic Preservation Officer to be eligible for listing on the CRHR, the NRHP, or the San Gabriel Register of Cultural Resources; or
4) Located in areas with high or medium potential for the presence of Cultural Resources, as determined by the City's Cultural Resource Sensitivity Map (City of San Gabriel 2017:39).

As mandated by the City, all projects that meet any of the above criteria are required to submit a Phase I Cultural Resources Inventory Report addressing potential cultural resources issues for the project.

3 Natural and Cultural Setting

3.1 Natural Setting

The project site is situated in Los Angeles County approximately eight miles east of downtown Los Angeles, where the climate is characterized by long, hot, dry summers and short, relatively wet winters. Topography on the project site is comprised of gently sloped hills to the southeast and southwest toward the Los Angeles County Flood Control District-owned Alhambra Wash. Biotic communities associated with the project vicinity include the Coastal Sage Scrub Community, the Desert Scrub Community, and the Alluvial Scrub Community (McKenna et al. 2000). Soils are alluvial and occur along relatively major water courses. Elevations within the project site range between 445 feet and 415 feet above mean sea level.

The project site is located within an urbanized environment characterized by residential land uses. The project is approximately 0.4-miles northwest of the historic Mission San Gabriel de Arcangel and within the boundaries of lands maintained by the Mission until ca. 1834 (McKenna et al. 2000).

3.2 Cultural Setting

The cultural setting for the project vicinity is presented broadly in what follows under three overviews: Prehistoric, Ethnographic, and Historic. The Prehistoric and Historic overviews describe human occupation before and after European contact; the Ethnographic Overview provides a synchronic “snapshot” of traditional Native American lifeways as described by European observers prior to assimilative actions.

3.2.1 Prehistoric Context

Numerous chronological sequences have been devised to aid in understanding cultural changes in southern California. Building on early studies and focusing on data synthesis, Wallace (1955, 1978) developed a prehistoric chronology for the southern California coastal region that is still widely used today and is applicable to near-coastal and many inland areas, including the current project site. Four periods are presented in Wallace’s prehistoric sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. Although Wallace’s (1955) synthesis initially lacked chronological precision due to a paucity of absolute dates (Moratto 1984:159), this situation has been alleviated in recent years by the compilation of thousands of radiocarbon dates obtained by southern California researchers (Byrd and Raab 2007:217). Several revisions have been made to Wallace’s (1955) synthesis using radiocarbon dates and projectile point assemblages (e.g., Koerper and Drover 1983; Mason and Peterson 1994; Koerper et al. 2002).

Horizon I- Early Man (ca. 10,000 – 6000 BCE)

When Wallace defined the Horizon I (Early Man) period in the mid-1950s, there was little evidence of human presence on the southern California coast prior to 6000 BCE. Archaeological work in the intervening years has identified numerous pre-8000 BCE sites, both on the mainland coast and the Channel Islands (e.g., Erlandson 1991; Johnson et al. 2002; Moratto 1984; Rick et al. 2001:609). The earliest accepted dates for occupation in the region are from two of the northern Channel Islands, located off the coast of Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area about 10,000 years ago (Erlandson 1991:105). On Santa Rosa Island, human remains have been dated from the Arlington Springs site to approximately 13,000 years ago (Johnson et al. 2002).

Recent data from Horizon I sites indicate the economy was a diverse mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas (e.g., Jones et al. 2002) and on Pleistocene lakeshores in eastern San Diego County (see Moratto 1984:90–92). Although few Clovis-like or Folsom-like fluted points have been found in southern California (e.g., Dillon 2002; Erlandson et al. 1987), it is generally thought the emphasis on hunting may have been greater during Horizon I than in later periods. Common elements in many sites from this period, for example, include leaf-shaped bifacial projectile points and knives, stemmed or shouldered projectile points, scrapers, engraving tools, and crescents (Wallace 1978:26–27). Subsistence patterns shifted around 6000 BCE coincident with the gradual desiccation associated with the onset of the Altithermal climatic regime, a warm and dry period that lasted for about 3,000 years. After 6000 BCE, a greater emphasis was placed on plant foods and small animals

Horizon II Milling Stone (6000–3000 BCE

The Milling Stone Horizon of Wallace (1955, 1978) and Encinitas Tradition of Warren (1968) (6000 to 3000 BCE) are characterized by subsistence strategies centered on collecting plant foods and small animals. Food procurement activities included hunting small and large terrestrial mammals, sea mammals, and birds; collecting shellfish and other shore species; near-shore fishing with barbs or gorges; the processing of yucca and agave; and the extensive use of seed and plant products (Kowta 1969). The importance of the seed processing is apparent in the dominance of stone grinding implements in contemporary archaeological assemblages, namely milling stones (metates and slabs) and handstones (manos and mullers). Milling stones occur in large numbers for the first time during this period, and are more numerous still near the end of this period. Recent research indicates Milling Stone Horizon food procurement strategies varied in both time and space, reflecting divergent responses to variable coastal and inland environmental conditions (Byrd and Raab 2007:220).

Milling Stone Horizon sites are common in the southern California coastal region between Santa Barbara and San Diego, and at many inland locations (e.g., Herring 1968; Langenwalter and Brock 1985; Sawyer and Brock 1999; Sutton 1993; True 1958). Wallace (1955, 1978) and Warren (1968) relied on several key coastal sites to characterize the Milling Stone period and Encinitas Tradition, respectively. These include the Oak Grove Complex in the Santa Barbara region, Little Sycamore in southwestern Ventura County, Topanga Canyon in the Santa Monica Mountains, and La Jolla in San Diego County. The well-known Irvine site (CA-ORA-64) has occupation levels dating between ca. 6000 and 4000 BCE (Drover et al. 1983; Macko 1998).

Stone chopping, scraping, and cutting tools made from locally available raw material are abundant in Milling Stone/Encinitas deposits. Less common are projectile points, which are typically large and leaf-shaped, and bone tools such as awls. Items made from shell, including beads, pendants, and abalone dishes, are generally rare. Evidence of weaving or basketry is present at a few sites. Kowta (1969) attributes the presence of numerous scraper-planes in Milling Stone sites to the preparation of agave or yucca for food or fiber. The mortar and pestle, associated with pounding foods such as acorns, were first used during the Milling Stone Horizon (Wallace 1955, 1978; Warren 1968).

Cogged stones and discoidals are diagnostic Milling Stone period artifacts, and most specimens have been found at sites dating between 4000 and 1000 BCE (Moratto 1984:149). The cogged stone is a ground stone object with gear-like teeth on its perimeter. Discoidals are similar to cogged stones, differing primarily in their lack of edge modification. Discoidals are found in the archaeological record subsequent to the introduction of the cogged stone. Cogged stones and discoidals are often purposefully buried, and are found mainly in sites along the coastal drainages from southern Ventura County southward, with a few specimens inland at Cajon Pass, and heavily in Orange County (Dixon 1968:63; Moratto 1984:149). These artifacts are often interpreted as ritual objects (Eberhart 1961:367; Dixon 1968:64–65), although alternative interpretations (such as gaming stones) have also been put forward (e.g., Moriarty and Broms 1971).

Characteristic mortuary practices of the Milling Stone period or Encinitas Tradition include extended and loosely flexed burials, some with red ochre, and few grave goods such as shell beads and milling stones interred beneath cobble or milling stone cairns. “Killed” milling stones, exhibiting holes, may occur in the cairns. Reburials are common in the Los Angeles County area, with north-oriented flexed burials common in Orange and San Diego counties (Wallace 1955, 1978; Warren 1968).

Koerper and Drover (1983) suggest Milling Stone period sites represent evidence of migratory hunters and gatherers who used marine resources in the winter and inland resources for the remainder of the year. Subsequent research indicates greater sedentism than previously recognized. Evidence of wattle-and-daub structures and walls has been identified at several sites in the San Joaquin Hills and Newport Coast area (Mason et al. 1991, 1992, 1993; Koerper 1995; Strudwick 2005; Sawyer 2006), while numerous early house pits have been discovered on San Clemente Island (Byrd and Raab 2007:221–222). This architectural evidence and seasonality studies suggest semi-permanent residential base camps were relocated seasonally (de Barros 1996; Koerper et al. 2002; Mason et al. 1997) or permanent villages from which a portion of the population left at certain times of the year to exploit available resources (Cottrell and Del Chario 1981).

Horizon III- Intermediate (3000 BCE – CE 500)

Following the Milling Stone Horizon, Wallace’s Intermediate Horizon and Warren’s Campbell Tradition in Santa Barbara, Ventura, and parts of Los Angeles counties, date from approximately 3000 BCE to CE 500 and are characterized by a shift toward a hunting and maritime subsistence strategy, along with a wider use of plant foods. The Campbell Tradition (Warren 1968) incorporates David B. Rogers’ (1929) Hunting Culture and related expressions along the Santa Barbara coast. In the San Diego region, the Encinitas Tradition (Warren 1968) and the La Jolla Culture (Moriarty 1966; Rogers 1939, 1945) persist with little change during this time.

During the Intermediate Horizon and Campbell Tradition, there was a pronounced trend toward greater adaptation to regional or local resources. For example, an increasing variety and abundance of fish, land mammal, and sea mammal remains are found in sites along the California coast during this period. Related chipped stone tools suitable for hunting are more abundant and diversified, and shell fishhooks become part of the tool kit during this period. Larger knives, a variety of flake scrapers, and drill-like implements are common during this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Koerper and Drover (1983) consider Gypsum Cave and Elko series points, which have a wide distribution in the Great Basin and Mojave deserts between ca. 2000 BCE and CE 500, to be diagnostic of this period. Bone tools, including awls, were more numerous than in the preceding period, and the use of asphaltum adhesive was common.

Mortars and pestles became more common during this period, gradually replacing manos and metates as the dominant milling equipment. Hopper mortars and stone bowls, including steatite vessels, appeared in the tool kit at this time as well. This shift appears to correlate with the diversification in subsistence resources. Many archaeologists believe this change in milling stones signals a shift away from the processing and consuming of hard seed resources to the increasing importance of the acorn (e.g., Glassow et al. 1988; True 1993). It has been argued that mortars and pestles may have been used initially to process roots (e.g., tubers, bulbs, and corms associated with marshland plants), with acorn processing beginning at a later point in prehistory (Glassow 1997:86) and continuing to European contact.

Characteristic mortuary practices during the Intermediate Horizon and Campbell Tradition included fully face-down or face-up flexed burials, oriented toward the north or west (Warren 1968:2–3). Red ochre was used commonly, and abalone shell dishes were found infrequently. Interments sometimes occurred beneath cairns or broken artifacts. Shell, bone, and stone ornaments, including charmstones, were more common than in the preceding Encinitas Tradition. Some later sites include Olivella shell and steatite beads, mortars with flat bases and flaring sides, and a few small points. The broad distribution of steatite from the Channel Islands and obsidian from distant inland regions, among other items, attest to the growth of trade, particularly during the latter part of this period. Recently, Byrd and Raab 2007 (220–221) have suggested the distribution of Olivella grooved rectangle beads marks "a discrete sphere of trade and interaction between the Mojave Desert and the southern Channel Islands."

Horizon IV- Late Prehistoric Horizon (CE 500–Historic Contact)

In the Late Prehistoric Horizon (Wallace 1955; 1978), which lasted from the end of the Intermediate (ca. CE 500) until European contact, there was an increase in the use of plant food resources in addition to an increase in land and sea mammal hunting. There was a concomitant increase in the diversity and complexity of material culture during the Late Prehistoric, demonstrated by more classes of artifacts. The recovery of a greater number of small, finely worked projectile points, usually stemless with convex or concave bases, suggests an increased usage of the bow and arrow rather than the atlatl (spear thrower) and dart for hunting. Other items include steatite cooking vessels and containers, the increased presence of smaller bone and shell circular fishhooks, perforated stones, arrow shaft straighteners made of steatite, a variety of bone tools, and personal ornaments made from shell, bone, and stone. There is also an increased use of asphalt for waterproofing and as an adhesive.

Many Late Prehistoric sites contain beautiful and complex objects of utility, art, and decoration. Ornaments include drilled whole Venus clam (Chione spp.) and drilled abalone (Haliotis spp.). Steatite effigies become more common, with scallop (Pecten spp. and Argopecten spp.) shell rattles common in middens. Mortuary customs are elaborate and include cremation and interment with abundant grave goods. By CE 1000, fired clay smoking pipes and ceramic vessels began to appear at some sites (Drover 1971, 1975; Meighan 1954). The scarcity of pottery in coastal and near-coastal sites implies ceramic technology was not well developed in the area, or that ceramics were obtained by trade with neighboring groups to the south and east. The lack of widespread pottery manufacture is usually attributed to the high quality of tightly woven and watertight basketry which functioned in the same capacity as ceramic vessels.

During this period, there was an increase in population size accompanied by the advent of larger, more permanent villages (Wallace 1955:223). Large populations and, in places, high population densities are characteristic, with some coastal and near-coastal settlements containing as many as

1,500 people. Many of the larger settlements were permanent villages in which people resided year-round. The populations of these villages may have also increased seasonally.

In Warren's (1968) cultural ecological scheme, the period between CE 500 and European contact is divided into three regional patterns. The Chumash Tradition is present mainly in the region of Santa Barbara and Ventura counties; the Takic or Numic Tradition is present in the Los Angeles, Orange, and western Riverside counties region; and the Yuman Tradition is present in the San Diego region. The seemingly abrupt changes in material culture, burial practices, and subsistence focus at the beginning of the Late Prehistoric period are thought to be the result of a migration to the coast of peoples from inland desert regions to the east. In addition to the small triangular and triangular side-notched points similar to those found in the desert regions in the Great Basin and Lower Colorado River, Colorado River pottery and the introduction of cremation in the archaeological record are diagnostic of the Yuman Tradition in the San Diego region. This combination suggests a strong influence from the Colorado Desert region.

In Los Angeles, Orange, and western Riverside counties, similar changes (introduction of cremation, pottery, and small triangular arrow points) are thought to be the result of a Takic migration to the coast from inland desert regions. This Takic or Numic Tradition was referred to formerly as the "Shoshonean wedge" or "Shoshonean intrusion" (Warren 1968). This terminology, used originally to describe a Uto-Aztecan language group, is generally no longer used to avoid confusion with ethnohistoric and modern Shoshonean groups who spoke Numic languages (Heizer 1978:5; Shipley 1978:88, 90). Modern Gabrieliño/Tongva in this region are considered the descendants of the prehistoric Uto-Aztecan, Takic-speaking populations who settled along the California coast during this period or perhaps somewhat earlier.

3.2.2 Ethnographic Context

The project site is located in the traditional territory of the Native American group known as the Gabrieliño, Tongva or Kizh (Bean and Smith 1978:538; Johnston 1962; Kroeber 1925:Plate 57; McCawley 1996). What the Native Americans who inhabited southern California called themselves has long been a topic of discussion among scholars and living descendants of these people (Johnston 1962; McCawley 1996; Reid 1978). While the name Gabrieliño was applied by the Spanish to those natives that were associated with the Mission San Gabriel Arcángel (Bean and Smith 1978), that name does not necessarily correlate to how the inhabitants of the region referred to themselves. Today, most contemporary Gabrieliño prefer to identify themselves as Tongva (King 1994), though some use the name Kizh. Generally, the names Tongva and Kizh are derivatives of placenames or village names in and around Mission San Gabriel, or referents to inhabitants of those villages. The village of "tōŋwe" was purported to be near Mission San Gabriel, and its inhabitants may have been referred to as Tobikhar (McCawley 1996:9). The name Kizh, Kij, or Kichereño was associated with people living near the original location of Mission San Gabriel, approximately 3 miles southeast of its present location (California Missions Resources Center N.d.). The word Kizh is likely a derivative of a word meaning "house." The name Tongva is used throughout the remainder of this report as it is currently most commonly used by present day descendants (McCawley 1996).

Tongva territory included the Los Angeles basin and southern Channel Islands as well as the coast from Aliso Creek in the south to Topanga Creek in the north. Their territory encompassed several biotic zones, including coastal marsh, coastal strand, prairie, chaparral, oak woodland, and pine forest (Bean and Smith 1978; McCawley 1996). The watersheds of the Rio Hondo, the Los Angeles, and the Santa Ana rivers as well as many tributaries and creeks such as Ballona Creek, Tujunga Wash, Arroyo Seco and others were within the territory of the Tongva. The Tongva territory was bordered by several different Native American groups including the Serrano to the north and northeast, the Tataviam to the north, the Chumash to the northwest, the Cahuilla to the east, and the Luiseño and Juaneño to the south and southeast.

The Tongva language belongs to the Takic branch of the Uto-Aztecan language family, which can be traced to the Great Basin region (Mithun 1999). This language family includes dialects spoken by the nearby Juaneño and Luiseño, but is considerably different from those of the Chumash people living to the north and the Diegueño (including Ipai, Tipai, and Kumeyaay) people living to the south.

Tongva society was organized along patrilineal non-localized clans, a common Takic pattern. Each clan had a ceremonial leader and contained several lineages. The Tongva established permanent villages and smaller satellite camps throughout their territory. Recent ethnohistoric work (O'Neil 2002) suggests a total tribal population of nearly 10,000, considerably more than earlier estimates of around 5,000 people (Bean and Smith 1978:540). Tongva subsistence was oriented around acorns supplemented by the roots, leaves, seeds, and fruits of a wide variety of plants and animals. Meat sources included large and small mammals, freshwater and saltwater fish, shellfish, birds, reptiles, and insects (Kroeber 1976; Bean and Smith 1978; McCawley 1996; Langenwalter et al. 2001).

The Tongva employed a wide variety of tools and implements to gather and hunt food. The digging stick, used to extract roots and tubers, was frequently noted by early European explorers (Rawls 1984). Other tools included the bow and arrow, traps, nets, blinds, throwing sticks and slings, spears, harpoons, and hooks. Like the Chumash, the Tongva made oceangoing plank canoes (known as a ti'at) capable of holding six to 14 people used for fishing, travel, and trade between the mainland and the Channel Islands. Tule reed canoes were employed for near-shore fishing (Blackburn 1963; McCawley 1996).

The Tongva lived in circular domed structures made up of thatched tule covering a frame of wooden poles usually of willow. Size estimates vary for these houses, and very few have been identified in archaeological contexts; however, some are said to have been able to house up to 50 people (Bean and Smith 1978). In cases where houses have been identified and recovered archaeologically, extramural features such as hearths and storage pits have been identified (Vargas et al. 2016).

Chinigchinich, the last in a series of heroic mythological figures, was central to Tongva religious life at the time of Spanish contact (Kroeber 1976). The belief in Chinigchinich was spreading south among other Takic-speaking groups at the same time the Spanish were establishing Christian missions. Elements of Chinigchinich beliefs suggest it was a syncretic mixture of Christianity and native religious practices (McCawley 1996). Prior to European contact, deceased Tongva were either buried or cremated, with burial more common on the Channel Islands and the adjacent mainland coast and cremation on the remainder of the coast and in the interior (Harrington 1942; McCawley 1996). However, after pressure from Spanish missionaries, cremation essentially ceased during the post-contact period (McCawley 1996).

Several different Tongva village or community locations have been identified in the San Gabriel Valley. The names Shevaanga, Sonaanga, Sheshiikwanonga, Akuuronga, Aluupkenga, Ashuukshanga, Weniinga, and Ahwiinga have all been identified as communities along the watershed feeding the Rio Hondo River out of the San Gabriel Mountains (McCawley 1996:42). The village of Shevaanga was said to be located at the present site of the Mission San Gabriel. In the more immediate vicinity of the project area, the villages of Shevaanga, Sonaanga, Sheshiikwanonga, and Akuuronga have been identified as relatively close-knit communities, likely with political and economic ties to one another (McCawley 1996:41). These communities were said to have shared a common dialect that Mission priests referred to as Simbanga (Kroeber 1925; McCawley 1996).

3.2.3 Historic Context

Post-Contact history for the state of California is generally divided into three periods: the Spanish Period (1769–1822), Mexican Period (1821–1848), and American Period (1848–present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish Period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican Period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican-American War, signals the beginning of the American Period when California became a territory of the United States.

Spanish Period (1769–1822)

Spanish explorers made sailing expeditions along the coast of southern California between the mid-1500s and mid-1700s. In search of the legendary Northwest Passage, Juan Rodríquez Cabríllo stopped in 1542 at present-day San Diego Bay. With his crew, Cabríllo explored the shorelines of present Catalina Island as well as San Pedro and Santa Monica Bays. Spanish naval officer Sebastián Vizcaíno mapped and recorded much of the present California and Oregon coastline in the next half-century. Vizcaíno's crew also landed on Santa Catalina Island and at San Pedro and Santa Monica Bays, giving each location its long-standing name. The Spanish crown laid claim to California based on the surveys conducted by Cabríllo and Vizcaíno (Bancroft 1885:96–99, Gumprecht 1999:35).

More than 200 years passed before Spain began the colonization and inland exploration of Alta California. The 1769 overland expedition by Captain Gaspar de Portolá marks the beginning of California's Historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, while Portolá was exploring southern California, Franciscan Friar Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823.

The Portolá expedition first reached the present-day boundaries of Los Angeles in August 1769, thereby becoming the first Europeans to visit the area. Father Crespi named "the campsite by the river Nuestra Señora la Reina de los Angeles de la Porciúncula" or "Our Lady the Queen of the Angels of the Porciúncula." Two years later, Friar Junípero Serra returned to the valley to establish a Catholic mission, the Mission San Gabriel Arcángel, on September 8, 1771 (Kyle 2002:151).

Between 1774 and 1776, a second expedition lead by Juan Bautista de Anza traveled west from Sinaloa across the Arizona and California deserts to enter the coastal valley of southern California. The purpose of the expedition was to establish a mission and presidio on the San Francisco Bay. The trail that was established by Anza became a major land route for Spanish settlers in the late 18th and early 19th centuries.

On September 8, 1771, Mission San Gabriel Arcángel (Mission San Gabriel) was established in present-day Montebello, approximately 3 miles southeast of its present location (California Missions Resources Center N.d.). In 1774 Juan Bautista de Anza arrived at the mission with an exploring party after completing the first land link with Sonora, Mexico. Due to frequent flooding, the mission was relocated in 1775 to its current site near the San Gabriel River. De Anza later returned to the reestablished Mission in 1776 with 240 colonists bound for San Francisco. Mission San Gabriel was the fourth of 21 missions established between 1769 and 1823 in Alta California, and the first permanent Euro-American settlement in Los Angeles County.

Mission San Gabriel quickly became one of the wealthiest and most expansive missions in Alta California. The Mission was known for its thriving agriculture industry leading to its reputation as the "Pride of the Missions" (California Missions Foundation 2019; City of San Gabriel N.d.). Surrounding the mission were vast agricultural lands, vineyards, gardens, and livestock. One early technological advancement came in 1816 when the mission's first mill was constructed in nearby San Marino. Referred to as El Molino Viejo (the Old Mill), the mill was the first of its kind in the area, but, due to a flawed design, it was replaced in 1821 by a mill on the grounds of the mission; a portion of the original mill was recently discovered, partially recovered, and restored on the mission grounds. Designed by Joseph Chapman in the model of American textile mills, and built with Native American labor, Chapman's mill represented a great innovation.

During this period, Spain also granted ranchos to prominent citizens and soldiers in the area. To manage and expand their herds of cattle on these large ranchos, colonists enlisted the labor of the surrounding Native American population (Engelhardt 1927). The missions were responsible for administrating to the local Indians as well as converting the population to Christianity (Engelhardt 1927). The influx of European settlers brought the local Native American population in contact with European diseases which they had no immunity against, resulting in a catastrophic reduction in native populations throughout the state (McCawley 1996).

One important aspect of San Gabriel's long history in the region stretches back to this era. In 1781, a procession of soldiers, laypeople, and priests led by Spanish Governor Felipe de Neve left Mission San Gabriel to select a new townsite for Los Angeles. Governor Neve and representatives from the mission sought to establish Los Angeles in order to supplement the agricultural goods produced at the mission (Fogelson 1967). Los Angeles's site shifted twice due to flooding from the nearby river, and eventually settled at the present-day Los Angeles Plaza Historic District.

In 1781, a group of 11 Mexican families traveled from Mission San Gabriel Arcángel to establish a new pueblo called El Pueblo de la Reyna de Los Angeles (The Pueblo of the Queen of the Angels). This settlement consisted of a small group of adobe-brick houses and streets and would eventually be known as the Ciudad de Los Angeles (City of Angels).

Mexican Period (1821–1848)

The Mexican Period commenced when news of the success of the Mexican War of Independence (1810 – 1821) against the Spanish crown reached California in 1822. This period saw the privatization of mission lands in California with the passage of the Secularization Act of 1833. This act federalized mission lands and enabled Mexican governors in California to distribute former mission lands to individuals in the form of land grants. Successive Mexican governors made approximately 700 land grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Shumway 2007). During this era, a class of wealthy landowners known as rancheros worked large ranches based on cattle hide and tallow production.

The beginnings of a profitable trade in cattle hide and tallow exports opened the way for larger, commercially driven farms. Land grants owned by the Spanish crown and clergy were distributed to mostly Mexican settlers born in California, or the "Californios." While this shift marked the beginning of the rancho system that would "dominate California life for nearly half a century" (Poole 2002:13), the rural character of emerging cities in and around San Gabriel and Los Angeles remained intact. Ranchos were largely self-sufficient enterprises (partly out of necessity, given California's geographic isolation), producing goods to maintain their households and operations.

By 1830, the holdings of Mission San Gabriel had come to include a lumbermill, leather and carpentry shops, a tile kiln, and wide-ranging facilities for the processing and production of soap, leather, hides, and other goods (Williams 2005:19). As for livestock, the mission boasted over 100,000 head of oxen, 20,000 horses, 40,000 sheep, 31,000 bushels of grain, and 500 barrels of wine and brandy (Sugranes 1909:5-7). In 1834, the vast land holdings of the mission were transferred to a civil administrator and in the subsequent decade, many artifacts and items of value were removed and the mission fell into disrepair.

In the 1840s, Governor Pío de Jesus Pico (who himself was born at Mission San Gabriel as the son of a mission guard) began selling off California's missions in order to fund local defense forces to support the Mexican-American War (Arnold 2013). In 1846, the Mexican government sold Mission San Gabriel and its 16,000 acres of land to early settlers and entrepreneurs William Workman and Don Hugo Reid in order to repay war debts due to the war (Engelhardt 1927:216-229).

During the supremacy of the ranchos (1834–1848), landowners focused their efforts largely on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of nonnative inhabitants increased during this period from the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population and to which they had no immunity.

American Period (1848–Present)

War in 1846 between Mexico and the United States precipitated the Battle of Chino, a clash between resident Californios and Americans in the San Bernardino area. The Mexican-American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period.

California became a state officially with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as United States Territories (Waugh 2003). Horticulture and livestock, primarily cattle, which had served as the currency and staple of the rancho system, continued to dominate the southern California economy through the 1850s. The Gold Rush began in 1848, and with the influx of people seeking gold, cattle were desired not only for their hides but also as a source of meat and tallow.

During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed the region's burgeoning mining and commercial industries. Cattle were at first driven along major trails or roads, such as the Gila Trail or Southern Overland Trail, and were then transported by trains when that mode of transport became available. The cattle boom ended for southern California as neighbor states and territories drove herds to northern California at reduced prices. By the 1890s, operation of the huge ranchos became increasingly difficult, and droughts reduced their productivity severely (Cleland 2005:102–103).

During the Gold Rush, San Gabriel became one of the first townships established in Los Angeles County. By 1860, the population as recorded by the US Census was just over 580 residents (Arnold 2013:31). The San Gabriel Valley was seen as a particularly inviting place for new settlement, due to its fertile soil, abundant land, and ample water supply. In this era, newly founded farmsteads were established, offering citrus and nut orchards, grain, and vineyards. Describing the offerings of the

San Gabriel Valley, local pioneer Benjamin Wilson noted that "every species of grain and fruit is in great abundance" in the valley (City of San Gabriel 1966).

The history of the emerging town continued to be closely tied to that of Mission San Gabriel. Following California's entry into the United States and the subsequent legal review of real estate transactions, the Catholic diocese regained ownership of the mission in 1853. Although decades of neglect had taken its toll on the mission, the church was returned to service as a parish between 1862 and 1908. In 1908, rebuilding efforts of Mission San Gabriel began, following the arrival of the Claretian Fathers who are credited with restoring the mission.

One of San Gabriel's pioneering residents in the early American period was David Franklin Hall, who arrived in 1854. Hall purchased a mission adobe residence on Mission Drive from Hipolito Cervantes and opened one of the town's first grocery stores. Between 1861 and 1874, Hall served as postmaster of San Gabriel. In the 1870s, Hall adapted his adobe residence as a hotel for visitors to San Gabriel. The San Gabriel Hotel continued to operate as the town's only hotel for a decade. Following Hall's ownership, the inn remained in use as a hotel, though under different names, such as the Bailey Hotel, Grapevine Inn, and eventually as Café de Espanola in the 1930s.

In the 1880s, a dramatic real estate boom arrived in southern California, fueled by a speculative real estate market and increasingly accessible rail travel (Deverell 1994). New southern Californian towns were promoted as havens for good health and economic opportunity. In 1883, the California Immigration Commission designed an advertisement declaring the state as "the Cornucopia of the World" (Poole 2002:36). Between 1880 and 1890, the population of Los Angeles expanded fivefold, from approximately 11,000 to 50,000; this figure peaked in 1888 at approximately 80,000 (Los Angeles Times 1891). Following the collapse of the real estate market in 1888, economic stagnancy lasted through the mid-1890s in the region. Despite the economic downturn, the industrial and commercial transformation of the region was well entrenched.

San Gabriel felt the effects of the 1880s real estate boom (and bust). The arrival of the Southern Pacific Railway Line, which intersected San Gabriel just north of the project site, catalyzed settlement, economic and agricultural expansion, and tourism in San Gabriel. Even in this early period, San Gabriel stood out from other new boom towns for its authentic, old world flavor. Given the proximity to the railway lines, agricultural goods, in particular citrus crops, thrived in San Gabriel and neighboring communities. In addition to goods, early businesspeople and real estate speculators in and around San Gabriel were anxious to capitalize on the influx of visitors and settlers and the abundance of open land. During the building boom of the 1880s, the East San Gabriel Hotel, a grand, 130-room resort was constructed. As the 1880s boom ended, however, the hotel was closed and repurposed as the Southern California Sanitarium, a retreat for the many health seekers drawn to the area by the southern California climate.

The City of San Gabriel

Founding Years

As the twentieth century began, Mission San Gabriel remained the cultural and aesthetic touchstone for the city's emerging identity and urban form. By the time the City of San Gabriel voted for incorporation in 1913, the Mission San Gabriel was already nearly 140 years old. In this way, San Gabriel recognized and embraced its unique heritage and culture. This is seen in the Mission Revival and Spanish Colonial Revival style buildings—civic, religious, institutional, and residential—throughout the City. (As the decades passed, another aspect of this recognition of the

City's unique heritage is in the growing awareness of the importance of the Native American heritage. For example, as noted above, in 1994 the City Council adopted a resolution formally recognizing the Gabrielino-Tongva Nation as "the aboriginal tribe of the Los Angeles Basin" (General Plan, Chapter 11, CR-5).

By the turn of the twentieth century, while most neighboring cities were emerging, Mission San Gabriel was established and already a local tourist attraction. In February 1900, the membership of the Los Angeles Camera Club set out for their third outing to a historic site of interest. The selected site was the Mission San Gabriel. Members of the outing were photographed taking a break at the site of the original San Gabriel Hotel, then known as the Grapevine Inn, across the street from the present-day site of the mission grounds and City Hall.

Even as San Gabriel recognized its past, it also embraced the future. Electricity arrived, along with Henry Huntington's Pacific Electric Car, which ran along the historic corridor of Mission Drive beginning in 1902. The ubiquitous Pacific Electric Cars, or "Red Cars" as they were known, facilitated regional travel and tourism, as well as residential settlement. In 1904, the San Gabriel Valley Country Club was founded on the site it still occupies. The club was constructed from a 50-acre parcel made up from the former Mission San Gabriel holdings. Following a fire, a new clubhouse was constructed in 1934, which is extant.

Commercial development also continued apace, with new shops, businesses, and merchants setting up along Mission Drive and other areas. In 1901, South San Gabriel Boulevard became home to the City's first two-story brick building, in the form of the Harris Feed Store, at 409 S. San Gabriel Boulevard. San Gabriel Boulevard was an undeveloped thoroughfare lined with tall Eucalyptus trees. In subsequent decades, this area would eventually become the East San Gabriel business district, with San Gabriel Boulevard at its center.

In the first decades of the twentieth century, the grand old East San Gabriel Hotel, long since abandoned as a resort hotel, had been purchased by the Southern California Masonic Home Association (1905) and the San Gabriel Film Company (1919), another notable sign of the times as the film industry was in its infancy. By 1925, the hotel was sold, demolished, and the vast grounds were sold off and subdivided for the residential and commercial tracts extant today.

San Gabriel's Incorporation and Boom Years, 1913 to 1930

The City's civic life and institutions began to take shape in earnest in the 1910s. In 1913, the City's residents voted in favor of incorporation. By 1914, San Gabriel's first team of city officials had been appointed, with A.J. Cunio serving as the first mayor and Ira A. Stouffer as city clerk. Civic infrastructure and institutions quickly followed. San Gabriel's first bank, located at 343 South Mission Drive, was constructed in 1914 near the Mission San Gabriel. The San Gabriel Woman's Club was founded in October 1913.

While the 1910s brought steady development and expansion, the 1920s witnessed a remarkable boom in population and building expansion. As has been well documented, the boom of the 1920s in Southern California brought an estimated 1.5 million new residents to the region (McWilliams 1946). The ascendancy of the automobile facilitated this influx and decisively shaped the character of the towns and cities emerging in this era. San Gabriel Valley itself was said to have a population of 100,000 residents by this time, with just over 5,000 residing in San Gabriel by 1925 (Los Angeles Times 1925).

San Gabriel saw significant expansion in the 1920s. In a reflection of the importance of the Mission San Gabriel in the city's civic and cultural life, new institutions not only looked to the Mission stylistically but also were constructed adjacent to the Mission itself. San Gabriel became home to a new Mission Revival-style post office (1922) and Spanish Colonial Revival-style City Hall (1923), both constructed adjacent to the Mission San Gabriel. Designed by renowned Los Angeles architects A.R. Walker and P.A. Eisen, the San Gabriel City Hall, which is extant, was constructed for an estimated cost of $60,000 (Los Angeles Times 1924).

With this institutional core established, new construction continued apace through the 1920s. Commercial development along Mission Street provided a growing range of services and gathering places. Residential settlement, as well as commercial and institutional development, grew outward from the original Mission San Gabriel site, extending northward and eastward along Mission Street. As of the late 1920s, most development and settlement in San Gabriel was concentrated in neighborhoods near the original mission site and grounds.

As San Gabriel expanded, the character of new construction drew inspiration from the City Beautiful Movement, from the historic eclecticism popular throughout Southern California, and most importantly from the history of the Mission San Gabriel. Many single-family residential neighborhoods from the 1920s reflect the period revival styles of the decade, including English Revival/Storybook, Colonial Revival, Tudor Revival, and of course Spanish Colonial Revival styles. But civic and institutional buildings continued to inflect the Spanish and mission past. In 1925, following the establishment of the San Gabriel Fire Department, a new Spanish Colonial style fire station was constructed in 1926 at 605 S. Del Mar Boulevard. That same year, the San Gabriel Chamber of Commerce was founded, with an office adjacent to the new City Hall. Toward the end of the decade, one of the most prominent projects (and still a signature landmark) in San Gabriel's civic core was the Mission Revival-style 1927 Mission Playhouse. Design to resemble the San Antonio de Padua Mission, the Mission Playhouse was originally designed by architect Arthur Burnett Benton. When Benton fell ill, architect William J. Dodd, of Los Angeles-based Dodd & Richards, took over and guided the project to completion, for an estimated total cost of $750,000.

Great Depression and Postwar Years

The boom of the 1920s ended abruptly with the onset of the Great Depression. Even so, San Gabriel saw a mini-construction boom in the late 1930s with the establishment of the Federal Housing Administration and its home ownership loan program. According to historic aerial photographs, one of the most notable periods of expansion took place between the late 1930s and late 1940s. As shown in the figures below, as of 1937, neighborhoods located around the original Mission San Gabriel were still sparsely developed, with some rectilinear grids of residential neighborhoods mixed in with orchards, agricultural lands, and open spaces. By the late 1940s, in the immediate postwar years, many of these tracts had already given way to a more densely developed residential neighborhoods, with commercial uses provided along the city's major thoroughfares, such as Mission Street, San Gabriel Boulevard, and Valley Boulevard.

Transportation improvements also spurred development in San Gabriel in the late 1930s and 1940s. Construction of the Arroyo Seco Parkway (State Route 110) in 1938 provided a convenient connection between the growing metropolis of Los Angeles and the towns of Pasadena and neighboring communities such as San Gabriel. In addition, construction of the San Bernardino Freeway (Interstate 10) just south of San Gabriel provided an easily accessible link for communities within Southern California as well as interstate travelers and tourists.

Although the most dramatic expansion occurred in the postwar period, many of San Gabriel's residential neighborhoods, in particular north of the Mission San Gabriel, had already begun taking shape in the late 1930s. Throughout these neighborhoods, streets are lined with the characteristic single-family homes known as "Minimal Traditional" residences, so named for the Federal Housing Administration program that sparked their design and development.

San Gabriel's residential neighborhoods expanded and filled in dramatically during the postwar period. Stylistically, homes constructed in this era primarily reflected the Ranch House style popular throughout the United States at the time. Postwar residential expansion also included Mid-Century Modern style homes. Mid-Century Modernism became the preferred style for commercial development in the postwar period. In terms of institutional expansion, the postwar baby boom triggered the need for new schools. As part of this expansion, San Gabriel High School was constructed in the early 1950s, with classes open by 1955. With its Mid-Century Modern-influenced style, the school displays a unified site plan with classrooms and accommodations for up to 1,200 students.

Along with the expanded residential settlement, between the early to mid-twentieth century, the economy of San Gabriel also shifted. The City became home to an increasing number of industrial and manufacturing concerns. By the 1960s, San Gabriel had become home to a number of large-scale businesses producing electronics and aerospace equipment. The character of San Gabriel Boulevard, which consists largely of commercial and industrial uses, remained intact well through the postwar years (and to the present day).

4 Background Research

4.1 Cultural Resources Records Search

On May 9, 2019, Rincon conducted a records search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton. The search was conducted to identify all previously recorded cultural resources and previously conducted cultural resources studies within a 0.5-mile radius of the project site. The CHRIS search included a review of the National Register of Historic Places, the CRHR, the Archaeological Determination of Eligibility list, and the California State Historic Resources Inventory list.

Rincon's cultural resources records search identified 17 previously conducted cultural resources studies within the 0.5-mile radius of the project site. None of these prior studies included the project site (Appendix A). The closest study to the project site is located approximately 700 feet to the north (LA-06806). Study LA-06806 included a cultural resources assessment for a Cingular Wireless Facility and did not result in the recordation of cultural resources. Table 1 provides a summary of the previously recorded reports located within the record search area.

Table 1 Previous Cultural Resource Studies within 0.5-mile Radius of the Project Site

Report Number	Author(s)	Year	Title	Relationship to Project Site
LA-03200	Cerrero, Richard	1995	*Cultural Resources Survey Report for the Agua Dulce Canyon Road Retaining Wall Project in the Soledad Area of Los Angeles County, California*	*Outside*
LA-03284	Rosenthal, Jane	1996	*Archaeological Monitoring of Northridge Earthquake Repairs, the Rectory Walkway, Mission Archangel, San Gabriel, Los Angeles County*	*Outside*
LA-04178	Hlava, Diane	1985	*Mission Playhouse Gift Shop; Adult Service Center*	*Outside*
LA-04835	Ashkar, Shahira	1999	*Cultural Resources Inventory Report for Williams Communications, Inc. Proposed Fiber Optic Cable System Installation Project, Los Angeles to Riverside, Los Angeles and Riverside Counties*	*Outside*
LA-06309	Duke, Curt	2002	*Cultural Resources Assessment Cingular Wireless Facility No. Vy 115-01 Los Angeles County, California*	*Outside*
LA-06329	Unknown	2002	*Supplemental Archival Research and Determination of Effect for the Alameda Corridor-east Project San Gabriel Trench and Crossings #2 and #3*	*Outside*
LA-06804	McKenna, Jeanette	2003	*Completion of an Archaeological Monitoring Program at the Pacific Building Group Site in San Gabriel, Los Angeles County, California*	*Outside*
LA-06806	Duke, Curt	2003	*Cultural Resource Assessment Cingular Wireless Facility No. Vy 312-02 Alhambra, Los Angeles County, California*	*Outside*

Report Number	Author(s)	Year	Title	Relationship to Project Site
LA-07074	O'Neil, Stephen, and Joan Brown	2003	*Monitoring of Construction During Trenching at the New Cemetery, Mission San Gabriel California*	*Outside*
LA-07301	Williams, Jack	2005	*A Phase One Archaeological Study of 400-412 West Mission Boulevard*	*Outside*
LA-08217	Schmidt, James	2000	*Archaeological Survey Report for the San Gabriel Trench Segment of the San Gabriel Valley Council of Governments Alameda Corridor East*	*Outside*
LA-10513	Smith, Francesca, and Robert Ramirez	2009	*Historic Property Survey Report for the San Gabriel Trench Grade Separation Project*	*Outside*
LA-12009	Ferland, Sara, Laura Hoffman, and John Dietler	2012	*Archaeological Testing and Monitoring of the Southern California Gas Company Mission Road Pipeline Replacement Project, City of San Gabriel, Los Angeles County, California: Addendum to the Archaeological Evaluation Report for the San Gabriel Trench Grade*	*Outside*
LA-12628	Brown, Joan	1992	*Archaeological Monitoring of Trenching within the San Gabriel Mission*	*Outside*
LA-12673	Dietler, John, and Caprice Harper	2010	*Treatment Plan for CA-LAN-184H and Three Archaeological Resource Locations for the San Gabriel Trench Grade Separation Project, Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California*	*Outside*
LA-12674	Harper, Caprice, Francesca Smith, and Sara Dietler	2010	*Finding of Adverse Effect for the San Gabriel Trench Grade Separation Project, Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California*	*Outside*
LA-12858	Dietler, John, Heather Gibson, and James Potter	2015	*Abundant Harvests: The Archaeology of Industry and Agriculture at San Gabriel Mission*	*Outside*

Source: SCCIC 2019

The cultural resources records search identified 42 previously recorded cultural resources in the 0.5-mile search radius of the project site (Table 2). Of these, 40 resources are from the historic period, the large majority of which are buildings; one resource dates to the protohistoric period and consists of the San Gabriel Mission Archaeological Site, and one resource is a prehistoric lithic scatter. The prehistoric resource is located approximately 1700 feet to the southeast. None of the previously recorded resources are located within or adjacent to the project site.

Table 2 Previously Recorded Resources within 0.5-Mile Radius of the Project Site

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-000184	CA-LAN-000184H	Protohistoric, Historic Site	San Gabriel Mission Archaeological Site	Pilling, A., 1955; Ramirez, R., and J. Covert, 2008; Dietler, J., K. Harper, R. Ramirez, J. Covert, and L Akyuz, 2009; Ramirez, R., J. Kietler, and J. Covert, 2009; Hoffman, L., G. Pacheco, and M. Adame, 2012; Stickel, G., 2017	California Historical Resource Status Code (CHRSC) 1S: Individual property listed in the NRHP by the Keeper. NRHP listing number: 71000158 California Registered Landmark	Outside
P-19-001034	CA-LAN-001034H	Historic Site	Ortega Vigare Adobe Site	Wasson, W., R. Marshall, and D. Sanburg, 1979	Listed on the CRHR. California Registered Landmark #451	Outside
P-19-004336	CA-LAN-004336	Prehistoric Site	Lithic Scatter	Vargas, B., G. Pacherco, J. Dietler, and S. Murray, 2013	Recommended ineligible for NRHP, CRHR, or local listing	Outside
P-19-186670	N/A	Historic Building	First Christian Church of Pomona	Marvin, J., 2001	Recommended ineligible NRHP; not evaluated for CRHR, or local listing	Outside
P-19-187867	N/A	Historic Building	Faith Inspirational Missionary Baptist Church	Taniguchi, B., 2005	Recommended ineligible NRHP; not evaluated for CRHR, or local listing	Outside
P-19-188651	N/A	Historic Building	Single-family property	Murray, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188652	N/A	Historic Building	Single-family property	Murray, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188664	N/A	Historic Building	Single-family property	Shawn, B., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188665	N/A	Historic Building	Single-family property	McMorris and Mikesell, 1999; Shawn, B., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188666	N/A	Historic Building	Multiple-family property	Edwards, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188669	N/A	Historic Building	Industrial building	Francisco, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188671	N/A	Historic Building	Commercial-industrial building	McMorris, and Mikesell, 1999, Francisco, S., and S. Edwards, K. Harper, and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188672	N/A	Historic Structure	Bridge; Alhambra Wash Culvert	Murray, S., F. Smith, and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188673	N/A	Historic Building	Commercial-industrial building	McMorris, and Mikesell, 1999; Francisco, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188674	N/A	Historic Building	Industrial building	Francisco, S., S. Edwards, and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188675	N/A	Historic Building	Industrial building	Francisco, S., and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188676	N/A	Historic Building	Educational building	Francisco, S., S. Edwards, and F. Smith	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation	Outside
P-19-188677	N/A	Historic Building, District	Mission San Gabriel Arcangel Historic District	Guthrie, C., 1935 and 1936; Davis, W., 1959; Welts, A., 1970; Arbuckle, J., 1979; Johnson-McAvoy, C., 1994; Johnson-McAvoy, C., 1995; Duffer, J., 1996; McMorris and Mikesell, 1999; Smith, F., and J. Steely, 2009	Listed in the NRHP and CRHR. NRHP listing number: 71000158 California Registered Landmark	Outside
P-19-188678	N/A	Historic Building, Element of District	Multiple-family property, religious building, adobe building; San Gabriel Mission Rectory, San Gabriel Mission Museum	Smith, F., and J. Steely, 2009	CHRSC 3B and 3CB: Appears eligible for NRHP/CRHR both individually and as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188679	N/A	Historic Building	Multiple-family property, religious building; San Gabriel Mission Rectory	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR, or local listing through survey evaluation; reevaluation recommended	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188680	N/A	Historic Building	Educational and religious building, San Gabriel Mission Elementary School San Gabriel Mission Parochial School	Smith, F., and J. Steely, 2009	CHRSC 2S2: Individual property determined eligible for NRHP by a consensus through Section 106 process, listed in the CRHR; 3B: Appears eligible for NRHP both individually and as a contributor to a NRHP eligible district through survey evaluation; 3CB:Appears eligible for CRHR bot individually and as a contributor to a CRHR eligible district through survey evaluation	Outside
P-19-188681	N/A	Historic Building, Element of District	Multiple-family property, religious building	Smith, F., and J. Steely, 2009	CHRSC 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188682	N/A	Historic Building, Element of District	Single-family property, adobe building	Sitton, T., 1979; Carmack, S., and J. Steely, 2009;	CHRSC 3B/3CD: Appears eligible for NRHP both individually and as a contributor to a NRHP eligible district through survey evaluation; appears eligible for CRHR as a contributor to a CRHR eligible district through survey evaluation	Outside
P-19-188683	N/A	Historic Building	Ancillary building, San Gabriel Mission Garages	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188686	N/A	Historic Structure	San Gabriel Mission Parochial School shade structure	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside
P-19-188687	N/A	Historic Site, Element of District	San Gabriel Mission Cemetery	Smith, F., and J. Steely, 2009	CHRSC 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188688	N/A	Historic Building, Element of District	San Gabriel Mission Parish Church Annunciation building	Smith, F., and J. Steely, 2009	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188689	N/A	Historic Building	San Gabriel Mission Arcangel Gift Shop	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside
P-19-188690	N/A	Historic Site, Object, Element of District	San Gabriel Mission Gardens	Smith, F., and J. Steely, 2009	CHRSC e: 3B, 3CB appears eligible for NRHP/CRHR both individually and as a contributor to NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188691	N/A	Historic Building	San Gabriel Mission School	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside
P-19-188692	N/A	Historic Building, Object	San Gabriel Mission Plaza Park	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188693	N/A	Historic Isolate	San Gabriel Mission Walkway Structures	Smith, F., and J. Steely, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside
P-19-188694	N/A	Historic Building, District	San Gabriel Adobe historic District	Carmack, S., F. Smith, and K. Harper	CHRSC: 3B, 3CB appears eligible for NRHP/CRHR both individually and as a contributor to NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188696	N/A	Historic Building, Structure, District	San Gabriel Civic Center Historic District	Smith, F., S. Francisco, and S. Edwards	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188697	N/A	Historic Building, Element of District	San Gabriel City Hall	McMorris and Mikesell, 1999; Francisco, S, S. Edwards, and F. Smith, 2009	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside
P-19-188698	N/A	Historic Building, Element of District	Commercial building	Francisco, S., S. Edwards, and F. Smith, 2009	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188698	N/A	Historic Building, Element of District	Commercial building	Francisco, S., S. Edwards, and F. Smith, 2009	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	NRHP/ CRHR Status[1]	Relationship to Project Site
P-19-188700	N/A	Historic Building, Element of District	Commercial building	Francisco, S., S. Edwards, and F. Smith, 2009	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188701	N/A	Historic Building, Element of District	Historic structure	Edwards, S., and F. Smith	CHRSC: 3D/3CD: Appears eligible for NRHP/CRHR as a contributor to a NRHP/CRHR eligible district through survey evaluation	Outside
P-19-188836	N/A	Historic Building	Mission Playhouse	Hlava, D., 1985	Recommended eligible for NRHP/CRHR and local listing	Outside
P-19-189870	N/A	Historic Building, Element of District	Ortega Vigare Adobe	Davis, W., 1949 and 1959; Arbuckle, J., 1979; Kondo, A., 1990; Carmack, S., and F. Smith, 2009; Dietler, J., and S. Murray, 2013; Newcomb, A., 2017	CHRSC: 3B, 3CB appears eligible for NRHP/CRHR both individually and as a contributor to NRHP/CRHR eligible district through survey evaluation	Outside
P-19-190564	N/A	Historic Structure	Culvert	Dietler, J., and S. Murray, 2013; Newcomb, A., 2017	CHRSC 6Z: Found ineligible for NRHP, CRHR or local designation through survey evaluation	Outside

Source: SCCIC 2019

4.2 Native American Scoping

As part of the background research process of identifying cultural resources for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search of the project site and vicinity (Appendix B). As part of this request, Rincon asked the NAHC to provide a list of Native American groups and/or individuals, culturally affiliated with the area, who may have knowledge of cultural resources within the project site. The NAHC responded on April 25, 2019, stating positive results and included a list of six Native American contacts that may have knowledge of cultural resources in the project vicinity. On May 6, 2019, Rincon prepared and mailed letters to the Native American contacts affiliated with the area, requesting that they contact

Rincon if they know of any Native American cultural resources on or immediately adjacent to the project site.

As of June 21, 2019, Rincon has not received any additional responses from Native American contacts. Rincon assumes the lead agency, the City of San Gabriel, will conduct AB 52 consultation with interested Native Americans as a separate effort, if applicable.

4.3 Historical Imagery Review

A review was conducted of historical aerial photographs and topographic maps of the project vicinity on April 16, 2019, and May 14, 2019 (NETRonline 2019, U.S. Geologic Survey Historical Topographic Map Explorer [USGS] 2019). The earliest map of the area dates to 1894 and depicts a road along present-day South Arroyo Drive with sparse residential development along the roadway and vicinity (USGS 2019). The 1894 Los Angeles topographic map depicts drainages traversing north/south just west of the project site and the Southern Pacific Railroad is located to the south (USGS 2019). Aerial photographs as early as 1948 depict the channelized Alhambra Wash bisecting the project site and a structure on the southeast corner of the project site. By 1952, a structure is visible in the northeast corner of the project site and remains onsite until present day (NETRonline 2019). Urban development in the vicinity of the project site increased between 1948 and 1964 and expanded to cover the majority of the project vicinity. Between 1994 and 2003 the structure in the southeast corner of the project site appears to have been demolished (Google Earth Pro 2019).

On-line maps of the Juan Bautista de Anza Expedition were also examined as part of the historical imagery review (NPS 2019). Results of this assessment indicate the historic corridor associated with the expedition is situated 0.33-miles south of the project site.

4.4 Literature Review and Research

Rincon conducted literature review and background research for the proposed project in June 2018. Research efforts included obtaining and reviewing the building permit records for the parcel from the City of San Gabriel Building and Safety Division. Dates of construction and subsequent alterations were determined by the building permit record as well as additional resources such as the field inspection and historic aerial photographs. Archival research was completed to establish the general history and context of the project site and included resources at the County of Los Angeles Public Library and online databases.

As a result of the literature review, Rincon confirmed the Alhambra Wash, a feature that traverses the project area, is identified in the City of San Gabriel’s 2004 Mission District Specific Plan as a cultural resource. Following consultation with the lead agency (City of San Gabriel), it was determined that no documentation on any potential significance of the Alhambra Wash was prepared as part of the Specific Plan. In consideration of this and also the fact that the City adopted an updated historic preservation ordinance in 2017, City staff requested Rincon revisit the eligibility of the subject property. For this reason, the segment of the Alhambra Wash that passes through the project area was evaluated for eligibility for listing in local, state, and national registers as described in further detail below.

5 Field Survey

5.1 Methods

On May 1, 2019, Rincon Archaeologist Sun Min Choi conducted a pedestrian field survey of the project site (Figure 2). The survey was conducted by walking a series of transects at approximately 10-meter intervals where terrain permitted. During the survey, Mr. Choi examined area of exposed ground surface for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, ceramics, fire-affected rock), ecofacts (marine shell and bone), soil discolorations indicative of the presence of cultural midden, soil depressions, and features indicative of the former presence of structures of buildings (e.g., standing exterior walls, postholes, foundations) or historic debris (e.g., metal, glass, ceramics). Ground disturbances, such as burrows and road cuts, were inspected visually. Field notes of survey conditions and observations were recorded using Rincon field forms and a digital camera. Copies of the original field notes and photographs are maintained at the Rincon Los Angeles office.

On June 7, 2018, Rincon Architectural Historian Alexandra Madsen, MA, conducted an intensive historic resource field survey of the project site. The field survey of the historic structures consisted of a visual inspection of all built environment features on the property, including the residence and Alhambra Wash to assess their overall condition and integrity, and to identify and document any potential character-defining features or alterations. Although all built environment features were inspected, only permanent buildings and structures were recorded. Ms. Madsen documented the field survey using field notes and digital photographs. Copies of the field notes and digital photographs from both surveys are on file with Rincon's Los Angeles office.

5.2 Results

5.2.1 Archaeological Resources

The project site consists of one historic-period residential building and the historic-period Alhambra Wash; the reminder of the project site is undeveloped land. The survey area associated with the residential property is characterized by sloping terrain near the northern boundary with a two-story building in the northeast corner surrounded by local vegetation, landscaped plantings, dry cut grasses, and enclosed by a concrete wall and chain link fencing (Figure 3). The eastern boundary of the residential property is bordered by the Alhambra Wash, which traverses northeast to southwest. The survey area east of the Alhambra Wash is characterized by undeveloped land with dry cut grasses and is enclosed by a chain link fence (Figure 4). Ground visibility throughout the project site was poor (less than 20 percent). Dense local vegetation, plantings and dry cut grasses, paved surfaces, and residential materials obscured ground visibility throughout the survey area (Figure 5). Exposed soils consisted of semi-compact and dry, light brown, clayey silt with pebbles and granitic rock inclusion.

Disturbances in the project site include the paved surfaces and residential use associated with the development of the western portion of the survey area and the concrete drainage of the channelized Alhambra Wash**.**

Figure 3 Overview of Survye Area and Residential Property, View to the Southeast

Figure 4 Survey Area View of Undeveloped Lot, View to the West

Figure 5 Visibility near the Residential Property, View Northwest

5.2.2 Built Environment Resources

As a result of the background research and historic resources survey, two built environment properties were identified within the project area over 45 years of age: a segment of the Alhambra Wash and 235 South Arroyo Drive. Each was recorded on California Department of Parks and Recreation (DPR) 523 series forms and evaluated for listing in the NRHP and CRHR, and for local designation. The DPR forms are included as Appendix C to this report.

Alhambra Wash

Architectural Description

The subject resource is an approximately 370-foot-long segment of the Alhambra Wash, a 7.2-mile-long utilitarian channelized stream that runs from Huntington Drive to the Rio Hondo. This segment is characterized by its reinforced concrete slab base and concrete channel walls, which are in turn topped by a barbed wire fence (Figure 6). The wash base is slightly sloped so water collects in the center of the body. Circular pipe scuppers are placed along the wash to ensure even distribution of draining water in times of flood. The Alhambra Wash is a rectangular reinforced concrete channel that serves as a tributary of the Rio Hondo. The wash features various culverts and is crossed by 8 bridges, including those at Roses Road, Las Tunas Drive, and New Avenue. The wash drains over 14 square miles of high developed areas in the cities of San Gabriel, Pasadena, San Marino, and Alhambra. The segment of the wash analyzed includes part of the area encapsulated in APN 5346-011-004.

The first mile of the Alhambra Wash was constructed in 1921. The additional 6 miles were completed incrementally between 1921 and 1938. Additional improvements were completed in 1947, 1953, 1955, and 1962. The subject segment of the Alhambra Wash does not appear to have been altered or received recognizable updates since its time of construction.

Figure 6 Alhambra Wash, View to the North

Property History

Prior to the harnessing of the Alhambra Wash, the Mission San Gabriel built over 20 miles of aqueducts. These aqueducts sufficed for early settlers but would oftentimes flood during the wet season. As the population grew in San Gabriel and the surrounding areas at the turn of the century, there was an increased demand for flood measures. As the Water Conveyance Systems in California Historic Context Development states:

> *By the 1920s and 1930s, Southern California communities approaching full use of their existing municipal water supplies took different responses to the perennial problem of water shortage. Until the waters of the Colorado could be tapped, Pasadena and other nearby cities has flood control districts and other water agencies construct works along the San Gabriel and Santa Ana rivers and their watersheds to capture the precipitation that fell during the short rainy season (JRP Historical Consulting Services 2000).*

The Alhambra Wash is a 7.2-mile long channelized river that was developed in multiple phases. The first planning phase occurred in 1916, when the County flood control engineer estimated the cost of harnessing the Alhambra Wash at just under $10,000 as part of a county-wide effort to contain various rivers and streams (*Los Angeles Times* 1916). Despite this early study, development of the wash was delayed in 1918 when a $4.5 million flood control bond in Los Angeles County was contested and sent to the Supreme Court of California. The court upheld the bond, allowing development of the wash to officially begin that same year (*Southwest Builder and Contractor* 1918).

In 1921, a newspaper article recorded the channelization of the first mile of the Alhambra Wash (*Los Angeles Times* 1921). The consequential development of the remaining 6 miles of the wash occurred between 1927 and 1938. In 1927, the area from Alhambra to the mouth of wash was created as an emergency flood control district (*Los Angeles Times* 1927). A flood in 1931 emphasized the need for the wash to feature more concrete channels to protect the city from flooding. Consequently, the wash received numerous improvements from 1934 to 1937.

Although archival records did not provide the wash's exact year of completion, historic aerials show that the remaining 6 miles of the wash were constructed between 1927, when aerials evidence an untamed river, and 1938, when the wash was channelized. Historic aerials captured the pre- and post-channelization of the subject segment of the Alhambra Wash from these years.

In October of 1938, the County Flood Control District assumed management of the Alhambra Wash and completed several alterations along the channel (U.S. Army Corp of Engineers 1999). After the initial stages of development from 1918-1921 and 1927-1938, the Alhambra Wash received numerous periodic updates and improvements to ensure that safety and efficiency measures were met. In 1955, the Alhambra-Monterey Park storm drain was constructed, which included a line from Emerson Avenue to the Alhambra Wash channel. In 1962, the U.S. Army Corps of Engineers completed additional unspecified updates along the wash (U.S. Army Corp of Engineers 1962). The Alhambra Wash is owned and managed by the U.S. Army Corps of Engineers.

Evaluation

To provide additional context in which to understand any potential significance of the Alhambra Wash, this evaluation references *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures* (JRP Historical Consulting 2000). This document sets forth guidelines for the appropriate consideration of water conveyance systems, including canals, ditches, and aqueducts. The context identifies "water conveyance systems" as structures designed to move water from one place to another and identifies the most common types of systems as those that conveyed water for irrigation, mining, communities, hydroelectric power production, reclamation, and large multi-purpose systems.

According to the context, the subject property would fall within the Community Development Theme, which discusses systems that were used to bring water into California communities, from densely-populated urban areas to small, rural towns. The context recognizes shared themes and technologies, but also acknowledges that most regions were unique in their patterns of development. While some communities had publicly-owned reservoirs, others allowed the privatization of streams by the means of pipes. Chlorination plants thrived in some communities, like Sacramento, while others piped in water from far-away water sources, like the Tuolumne River to San Francisco. This context provided insight regarding the potential significance of water conveyance systems in communities and their development.

As established in the Water Conveyance Systems in California Historic Context, when a property is evaluated for significance it may apply to an entire water conveyance system or only to the portion of the system in the project area (JRP Historical Consulting 2000). For this reason, the below evaluation is limited in scope to the 370-foot segment of the Alhambra Wash that transects the subject parcel.

The recorded segment of the Alhambra Wash is ineligible for listing in the NRHP, CRHR, or San Gabriel Register of Cultural Resources (San Gabriel Register) pursuant to any applicable designation criteria. The segment of the Alhambra Wash was not found to be associated with specific important events or important patterns of events in the history of the city, region, state, ore nation (Criteria A/1/1). Per the Water Conveyance Systems in California Historic Context, systems eligible under this criterion must have a direct association with specific important events such as the first long-distance transmission of hydroelectric power, or a pattern of events such as the development of irrigated farming. The system was one of many to be developed in southern California during the first decades of the twentieth century to expand a rapidly growing population. The property was constructed gradually between 1927 and 1938 and was not one of the earliest or most important means of water conveyance in the San Gabriel Valley, but rather served the general community of the surrounding area as one of multiple tributaries of the Rio Hondo.

Research did not suggest the segment of the Alhambra Wash is associated with an important person who made demonstrably important contributions to local, state, or national history (Criteria B/2/2). Additionally, the segment of the Alhambra Wash is not the earliest, best preserved, largest, or sole surviving example of a particular type of water conveyance system. Nor did this property introduce a design innovation that reflected an evolutionary trend in engineering. Instead, the property is a ubiquitous and utilitarian concrete-lined water conveyance system that was constructed during the boom of the channelization of rivers in southern California during the early decades of the twentieth century (Criteria D/4/4). A review of available evidence and records search results did not indicate the property is might yield information important to history or prehistory (Criteria D/4/4).

235 South Arroyo Drive

Architectural Description

The subject property at 235 South Arroyo Drive contains a single one-story residence that is accessible via Hampton Circuit. The building has a ‘T’-shaped footprint, concrete foundation, and cross-gable roof clad in composition shingles. A concrete walkway breaks from the driveway and provides a circuitous entrance to the residence (Figure 7).

The western façade of the residence features a rear addition with vertical clapboard siding, aluminum sliding windows, and a flat roof with an overhanging eave. The lower story of the addition serves as a 2-car garage with stucco siding (Figure 8). To the south, the two bays of the building open to a brick staircase that provides entry to building at what appears to be a rear living unit. A ribbon of vinyl windows along the second story features vinyl sliding and casement windows (Figure 9).

A secondary addition is situated on the eastern end of the southeastern bay of the residence. This addition features a sliding aluminum window, vertical clapboard siding, and a door with decorative screen. This addition is situated immediately adjoining the Alhambra Wash with no setback.

Figure 7 235 South Arroyo Drive, Northern Façade, 235 South Arroyo Drive

Figure 8 235 South Arroyo Drive, Western Façade and Garage Addition

Figure 9 235 South Arroyo Drive, Southern Façade

Property History

According to the building permit records, the single-family residence situated at the subject property was constructed circa 1947. Although the building has undergone numerous alterations including the installation of unoriginal vinyl windows and a rear addition, these changes were not recorded in the building permit records.

Sanborn Fire Insurance Maps for the City of San Gabriel span the years of 1910-1938; for this reason, the subject property was not captured in these maps. Similarly, San Gabriel City Directories only capture residents from the years: 1962, 1964, 1967, and 1971 (Polk's San Gabriel City Directory). Los Angeles County Assessor records were consulted to record previous ownership of the property. Table 1 presents an overview of the residence's ownership history.

Charles Terry, a carpenter, and Eva Terry were listed as residing at the subject property from the time of the residence's construction in 1947 to 1967 (Los Angeles County Assessor Records). In 1971, Eva Terry was listed as residing at the property (Polk's San Gabriel City Directory). The residence was listed for sale in 1974 and advertised a "park like setting" (Arcadia Tribune 1974). Olivia R. Furnari purchased the property in 1979; no information was available on Ms. Furnari (Los Angeles County Assessor Records). In 1980, Sol Segerman of Parents Without Partners and a Municipal Court clerk in Los Angeles resided at the property (Los Angeles Times 1980). The current owner of the property is Arroyo Development LLC.

Evaluation

235 South Arroyo Drive appears ineligible for listing in the NRHP, CRHR or SGRCR pursuant to any applicable designation criteria. The subject property was constructed in 1947 in an area bordering the cities of San Gabriel and Alhambra. Research did not suggest the residence is associated with an

event or series of events that made a significant contribution to the broad patterns of history in the city, region, state, or nation (Criteria A/1/1). Builder and owner Charles Terry was a carpenter and resided at the residence for over 25 years. Research did not indicate he or any other persons associated with the residence can be considered significant to local, state, or national history (Criteria B/2/2). The subject property contains a modified Ranch-style residence that has undergone extensive alterations. The residence does not embody distinctive characteristics of a type, period, or method of construction (Criteria C/3/3). A review of available evidence and records search results did not indicate the property is might yield information important to history or prehistory (Criteria D/4/4).

6 Findings and Recommendations

The results of the field surveys and literature research conducted as part of this study indicate one historic-period residential building is located on the project site and the historic-period Alhambra Wash traverses the project site in a northeast to southeast direction. Although the Alhambra Wash was previously identified as a cultural resource in the 2004 Mission District Specific Plan, consultation with staff at the City of San Gabriel failed to identify any associated documentation detailing any potential significance the property possesses. Due to this and the fact that the City has since adopted an updated historic preservation ordinance in 2017, the City as the lead agency for the current project requested the eligibility of the Alhambra Wash be reevaluated. As detailed above, the segment of the Alhambra Wash within the project area was found ineligible for the NRHP, CRHR, or local designation, as was the residential property at 235 South Arroyo Drive. Neither property is considered a historical resource under CEQA as a result.

Rincon therefore recommends a finding of ***no impact to historical resources*** under CEQA. Further, although the Alhambra Wash is not considered a historical resource, the propose project is not anticipated to result in any negative impacts to the water conveyance system. As proposed, the project would result in the construction of a vehicular bridge with pedestrian walkway over the Alhambra Wash. However, there are numerous bridges which currently cross the wash and the new construction would be consistent with the general features that currently characterize the wash.

No archaeological resources were identified during the background research and site survey for this project. However, the project site's proximity to the Mission District increases the potential for archaeological resources to be present on site therefore Rincon recommends a finding of ***less than significant impact to archaeological resources with mitigation incorporated*** for the project.

Due to the projects proximity to the Mission District, Rincon recommends that a Workers Environmental Awareness Program be prepared for the project prior to the start of ground disturbance and recommends the following standard best management practice in the event of an unanticipated discovery of cultural resources during project construction. The project is also required to adhere to regulations regarding the unanticipated discovery of human remains, detailed below.

6.1 Worker's Environmental Awareness Program

A qualified archaeologist should be retained to conduct a Worker's Environmental Awareness Program (WEAP) training on archaeological sensitivity for all construction personnel prior to the commencement of any ground-disturbing activities. The training should be conducted by an archaeologist who meets or exceeds the Secretary of Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983). Archaeological sensitivity training should include a description of the types of cultural material that may be encountered, cultural sensitivity issues, regulatory issues, and the proper protocol for treatment of the materials in the event of a find.

6.2 Unanticipated Discovery of Cultural Resources

If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (NPS 1983) should be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation and Native American consultation and archaeological monitoring may be warranted to mitigate any significant impacts.

6.3 Unanticipated Discovery of Human Remains

If human remains are found, existing regulations outlined in the State of California Health and Safety Code Section 7050.5 state that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the NAHC, which will determine and notify an MLD. The MLD shall complete the inspection of the site within 48 hours of being granted access and provide recommendations as to the treatment of the remains to the landowner.

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Appendix A

Records Search Summary

Report List

Arroyo Village City of San Gabriel, 19-7364

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
LA-03200		1995	Cerreto, Richard	Cultural Resources Survey Report for the Agua Dulce Canyon Road Retaining Wall Project in the Soledad Area of Los Angeles County, California	Chambers Group, Inc.	19-000541, 19-000543
LA-03284		1996	Rosenthal, Jane	Archaeological Monitoring of Northridge Earthquake Repairs, the Rectory Walkway, Mission Archangel, San Gabriel, Los Angeles County	Petra Resources, Inc.	19-000184, 19-000185
LA-04178		1985	Hlava, Diane	Mission Playhouse Gift Shop; Adult Service Center	LA Co. Community Development Commission	19-000184, 19-000185
LA-04835		1999	Ashkar, Shahira	Cultural Resources Inventory Report for Williams Communications, Inc. Proposed Fiber Optic Cable System Installation Project, Los Angeles to Riverside, Los Angeles and Riverside Counties	Jones & Stokes Associates, Inc.	19-186109, 19-186112, 19-187090
LA-06309		2002	Duke, Curt	Cultural Resource Assessment Cingular Wireless Facility No. Vy 115-01 Los Angeles County, California	LSA Associates, Inc.	
LA-06329		2002	Unknown	Supplemental Archival Research and Determination of Effect for the Alameda Corridor-east Project San Gabriel Trench and Crossings #2 and #3	Mooney & Associates	
LA-06804		2003	McKenna, Jeanette A.	Completion of an Archaeological Monitoring Program at the Pacific Building Group Site in San Gabriel, Los Angeles County, California	McKenna et al.	
LA-06806		2003	Duke, Curt	Cultural Resource Assessment Cingular Wireless Facility No. Vy 312-02 Alhambra, Los Angeles County, California	LSA Associates, Inc.	
LA-07074		2003	O'Neil, Stephen and Joan Brown	Monitoring of Construction During Trenching at the New Cemetery, Mission San Gabriel California	SWCA Environmental Consultants, Inc.	19-000184
LA-07301		2005	Williams, Jack S.	A Phase One Archaeological Study of 400-412 West Mission Boulevard	The Center For Spanish Colonial Research	19-000184, 19-000185
LA-08217		2000	Schmidt, James J.	Archaeological Survey Report for the San Gabriel Trench Segment of the San Gabriel Valley Council of Governments Alameda Corridor East	Greenwood and Associates	19-000184, 19-000185, 19-187367

Report List

Arroyo Village City of San Gabriel, 19-7364

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
LA-10513		2009	Smith, Francesca and Robert Ramirez	Historic Property Survey Report for the San Gabriel Trench Grade Separation Project	CalTrans District 7 and SWCA	19-000184, 19-000185, 19-004076, 19-004077, 19-186112, 19-187367, 19-188607, 19-188608, 19-188609, 19-188610, 19-188611, 19-188612, 19-188613, 19-188614, 19-188615, 19-188616, 19-188617, 19-188618, 19-188619, 19-188620, 19-188621, 19-188623, 19-188624, 19-188625, 19-188626, 19-188627, 19-188628, 19-188629, 19-188630, 19-188631, 19-188632, 19-188633, 19-188634, 19-188635, 19-188636, 19-188637, 19-188638, 19-188639, 19-188640, 19-188641, 19-188642, 19-188643, 19-188644, 19-188645, 19-188646, 19-188647, 19-188648, 19-188649, 19-188650, 19-188651, 19-188652, 19-188653, 19-188654, 19-188655, 19-188656, 19-188657, 19-188658, 19-188659, 19-188660, 19-188661, 19-188662, 19-188663, 19-188664, 19-188665, 19-188666, 19-188667, 19-188668, 19-188669, 19-188670, 19-188671, 19-188672, 19-188673, 19-188674, 19-188675, 19-188676, 19-188677, 19-188678, 19-188679, 19-188680, 19-188681, 19-188682, 19-188683, 19-188684, 19-188685, 19-188686, 19-188687, 19-188688, 19-188689, 19-188690, 19-188691, 19-188692, 19-188693, 19-188694, 19-188695, 19-188696, 19-188697, 19-188698, 19-188699, 19-188700, 19-188701, 19-188702, 19-188703, 19-188704, 19-188705
LA-12009		2012	Ferland, Sara, Hoffman, Laura, and Dietler, John	Archaeological Testing and Monitoring of the Southern California Gas Company Mission Road Pipeline Replacement Project, City of San Gabriel, Los Angeles County, California: Addendum to the Archaeological Evaluation Report for the San Gabriel Trench Grade	SWCA Environmental	19-000184
LA-12628		1992	Brown, Joan	Archaeological Monitoring of Trenching within the San Gabriel Mission	RMW Paleo Associates	19-188677

Report List

Arroyo Village City of San Gabriel, 19-7364

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
LA-12673		2010	Dietler, John and Harper, Caprice	Treatment Plan for CA-LAN-184H and Three Archaeological Resource Locations for the San Gabriel Trench Grade Seperation Project, Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California	SWCA Environmental	19-000184, 19-187367
LA-12674		2010	Harper, Caprice, Smith, Francesca, and Dietler, Sara	Finding of Adverse Effect for the San Gabriel Trench Grade Separation Project, Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California	SWCA Environmental	19-000184, 19-187367
LA-12858		2015	Dietler, John, Heather Gibson, and James M. Potter	Abundant Harvests: The Archaeology of Industry and Agriculture at San Gabriel Mission	SWCA Environmental Consultants	19-000184

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-000184	CA-LAN-000184H	Resource Name - San Gabriel Mission Archaeological Site	Structure, Site	Protohistoric, Historic	AH04 (Privies/dumps/trash scatters); AH06 (Water conveyance system); AH11 (Walls/fences); AH12 (Graves/cemetery); AH15 (Standing structures); AP02 (Lithic scatter); AP03 (Ceramic scatter); AP16 (Other) - olivella beads; HP16 (Religious building); HP44 (Adobe building/structure)	1955 (A. R. Pilling); 2008 (R. Ramirez and J. Covert, SWCA); 2009 (J. Dietler, K. Harper, R. Ramirez, J. Covert, and L. Akyuz, SWCA); 2009 (R. Ramirez, J. Dietler, and J. Covert, SWCA); 2012 (L. Hoffman, G. Pacheco, M. Adame, SWCA); 2017 (Gary Stickel, Kizh Tribe); 2018	LA-00335, LA-03284, LA-03583, LA-04178, LA-07074, LA-07301, LA-08217, LA-08703, LA-10513, LA-12009, LA-12673, LA-12674, LA-12858, LA-12911
P-19-001034	CA-LAN-001034H	Resource Name - The Ortega Vigare Adobe Site	Site	Historic	AH04 (Privies/dumps/trash scatters); HP02 (Single family property); HP44 (Adobe building/structure)	1979 (Warren Wasson, Ralph P. Marshall, Delmer E. Sanburg, Jr.)	LA-08703
P-19-004336	CA-LAN-004336	Resource Name - ACE-S-1	Site	Prehistoric	AP02 (Lithic scatter)	2013 (Benjamin Vargas, Gregorio Pacheco, John Dietler, Sam Murray, SWCA)	
P-19-186670		OHP Property Number - 132217; Resource Name - First Christian Church of Pomona	Building	Historic	HP16 (Religious building)	2001 (J. Marvin, LSA)	LA-06999, LA-10280, LA-12254
P-19-187867		OHP Property Number - 164287; Resource Name - Faith Inspiration Missionary Baptist Church; Other - Anchor Lodge 273	Building	Historic	HP16 (Religious building)	2005 (B. Taniguchi, Galvin & Associates)	LA-12764
P-19-188651		Resource Name - Fred & Flora Popple House; Other - Map Reference #3A-5	Building	Historic	HP02 (Single family property)	2009 (S. Murray and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188652		Resource Name - F E Underwood House; Other - Map Reference #3A-4	Building	Historic	HP02 (Single family property)	2009 (S. Murray and F. Smith, SWCA Environmental Consultants)	LA-10513

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-188664		Resource Name - Ernest & Marie Bonnabel House; Other - Map Reference #3-33	Building	Historic	HP02 (Single family property)	2009 (B. Shawn and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188665		OHP Property Number - 165119; Resource Name - Leonee Nouguier House; Other - Map Reference #3-31; Other - Mission-52	Building	Historic	HP02 (Single family property)	1999 (McMorris and Mikesell, JRP Historical Consulting Services); 2009 (B. Shawn and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188666		Other - Map Reference #3-22	Building	Historic	HP03 (Multiple family property)	2009 (S. Edwards and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188669		Resource Name - Federated Products; Other - Map Reference #3-3; Other - SoCAL Uniform Rental	Building	Historic	HP08 (Industrial building)	2009 (S. Francisco and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188671		OHP Property Number - 165105; Resource Name - San Gabriel Sheet Metal; Other - Map Reference #3-1; Other - Mission-14; Other - Morse Chemical Inc	Building	Historic	HP06 (1-3 story commercial building); HP08 (Industrial building)	1999 (McMorris and Mikesell, SWCA Environmental Consultants); 2009 (S. Francisco, S. Edwards, K. Harper, and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188672		Resource Name - Alhambra Wash Culvert; Other - Map Reference #2-34; Other - Alhambra Wash Arch; Other - Southern Pacific RR Bridge @ Mission Rd; Other - Alhambra Wash Improvement: Union Pacific R R Bridge @ Mssion Rd	Structure	Historic	HP11 (Engineering structure); HP19 (Bridge)	2009 (S. Murray, F. Smith, and J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188673		OHP Property Number - 165104; Resource Name - Dina-Mite Food Co; Other - Map Reference #2-33; Other - Mission-13; Other - Aloha Plumbing Inc	Building	Historic	HP06 (1-3 story commercial building); HP08 (Industrial building)	1999 (McMorris and Mikesell, JRP Historical Consulting Services); 2009 (S. Francisco and F. Smith, SWCA Environmental Consultants)	LA-10513, LA-11398
P-19-188674		OHP Property Number - 165103; Resource Name - Tubing Seal Co; Other - Map Reference #2-32; Other - American Furniture Systems	Building, Object	Historic	HP08 (Industrial building)	2009 (S. Francisco, S. Edwards and F. Smith, SWCA Environmental Consultants)	LA-10513

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-188675		Resource Name - Tubing Seal Co; Other - Map Reference #2-31; Other - American Furniture Systems Inc	Building	Historic	HP08 (Industrial building)	2009 (S. Francisco and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188676		Resource Name - San Gabriel High School; Other - Map Reference #2-28 @ 3-28	Building	Historic	HP15 (Educational building)	2009 (S. Francisco, S. Edwards and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188677		OHP Property Number - 034765; Resource Name - Mission San Gabriel Arcangel Historic District; Other - San Gabriel Mission; CHL - 158; OHP Property Number - 100673	Building, District	Historic	HP02 (Single family property); HP03 (Multiple family property); HP15 (Educational building); HP16 (Religious building); HP40 (Cemetery)	1935; 1936 (Chester Lyle Guthrie); 1959 (Wendell K. Davis); 1970 (Allen W. Welts, Dept of Parks & Rec); 1979 (Jim Arbuckle); 1994; 1994 (Christy Johnson McAvoy, HRG); 1995 (Christy Johnson McAvoy, HRG); 1995 (Christy Johnson McAvoy, HRG); 1996 (James D. Duffer, FEMA); 1999 (McMorris and Mikesell, JRP Historical Consulting); 2009 (F. Smith, J. Steely, WCA Environmental Consultants)	LA-10513, LA-12628
P-19-188678		Resource Name - San Gabriel Mission Rectory; Other - HABS (CA-37-8); Other - Map Reference #3-16; Other - San Gabriel Mission; Other - San Gabriel Mission Museum Bldg; Other - Monastery; Other - Padres' Quarters	Building, Element of district	Historic	HP03 (Multiple family property); HP16 (Religious building); HP44 (Adobe building/structure)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188679		Resource Name - San Gabriel Mission Rectory; Other - Map Reference #3-17; Other - San Gabriel Mission	Building	Historic	HP03 (Multiple family property); HP16 (Religious building)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-188680		OHP Property Number - 100673; Resource Name - San Gabriel Mission Elementary School San Gabriel Mission Parochial School; Other - Map Reference #3-17	Building, Element of district	Historic	HP15 (Educational building); HP16 (Religious building)	2009 (F. Smith, J. Steely, SCWA Environmental Consultants)	LA-10513
P-19-188681		Resource Name - Curia (Admininstration Bldg); Other - Map Reference #3-17; Other - Claretian Missionaries; Other - Western Province Inc; Other - Sons of the Immaculate Heart of Mary; Other - San Gabriel Mission	Building, Element of district	Historic	HP03 (Multiple family property); HP16 (Religious building)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188682		Resource Name - La Casa Lopez de Lowther Adobe; Other - HABS (CA 3-16); Other - Map Reference #3A-1; Other - Casa Lopez; Other - Casa Viejo de Lopez; Other - San Gabriel Mission	Building, Element of district	Historic	HP02 (Single family property); HP44 (Adobe building/structure)	1979 (Tom Sitton, Natural History Museum of LA); 2009 (S. Carmack, F. Smith, and J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188683		Resource Name - San Gabriel Mission Garages; Other - Map Reference #3A-1	Building	Historic	HP04 (Ancillary building)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188686		Resource Name - San Gabriel Mission Parochial School; Other - Map Reference #3-17	Structure	Historic	HP15 (Educational building); HP16 (Religious building); HP39 (Other) - Shade Structure	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188687		Resource Name - San Gabriel Missionl Cemetery; Other - Map Reference #3-16; Other - San Gabriel Mission Cemetery	Site, Element of district	Historic	HP40 (Cemetery)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188688		Resource Name - San Gabriel Mission Parish Church; Other - Map Reference #3-18; Other - Church of the Annunciation Bldg	Building, Element of district	Historic	HP16 (Religious building)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-188689		Resource Name - San Gabriel Mission Arcangel Gift Shop; Other - Map Reference #3-16; Other - San Gabriel Mission	Building	Historic	HP06 (1-3 story commercial building); HP16 (Religious building); HP46 (Walls/gates/fences)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188690		Resource Name - San Gabriel Mission Gardens; Other - Map Reference #'s 3-16 & 3-17; Other - Campo Santo; Other - Gardens; Other - Mission San Gabriel Arcangel Campo Santo and Work Area	Object, Site, Element of district	Historic	HP04 (Ancillary building); HP29 (Landscape architecture); HP40 (Cemetery)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188691		Resource Name - San Gabriel Mission Elementary School; Other - Map Reference #3A-2A; Other - San Gabriel Mission Parochial School	Building	Historic	HP15 (Educational building); HP16 (Religious building)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188692		Resource Name - San Gabriel Mission Plaza Park Site; Other - Map Reference #3-14	Building, Object	Historic	HP28 (Street furniture); HP30 (Trees/vegetation); HP31 (Urban open space)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188693		Resource Name - San Gabriel Mission Walkway Structures; Other - Map Reference #3-15	Other	Historic	HP28 (Street furniture); HP29 (Landscape architecture); HP31 (Urban open space)	2009 (F. Smith, J. Steely, SWCA Environmental Consultants)	LA-10513
P-19-188694		Resource Name - San Gabriel Adobe Historic District; Other - Las Tunas; Other - Casa Lopez; Other - Ortega Vigare Adobe	Building, District	Historic	HP02 (Single family property); HP44 (Adobe building/structure)	2009 (S. Carmack, F. Smith, and K. Harper, SWCA Environmental Consultants)	LA-10513
P-19-188696		Resource Name - San Gabriel Civic Center Historic District; Other - Civic Center	Building, Structure, District	Historic	HP06 (1-3 story commercial building); HP14 (Government building)	2009 (F. Smith, S. Francisco and S. Edwards, SWCA Environmental Consultants)	LA-10513

Resource List

Arroyo Village City of San Gabriel, 19-7364

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-19-188697		OHP Property Number - 079875; Resource Name - San Gabriel City Hall; Other - Map Reference #3-10; Other - Mission-17	Building, Element of district	Historic	HP14 (Government building)	1999 (McMorris and Mikesell, JRP Historical Consulting Services); 2009 (S. Francisco, S. Edwards and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188698		Resource Name - Arcade Shops; Other - Map Reference #3-11	Building, Element of district	Historic	HP06 (1-3 story commercial building)	2009 (S. Francisco, S. Edwards, and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188699		Resource Name - 1916 Commercial Bldg; Other - Map Reference #3-12	Building, Element of district	Historic	HP06 (1-3 story commercial building)	2009 (S. Francisco, S. Edwards, and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188700		Resource Name - Post Office (historic); Other - Map Reference #3-13; Other - John L. Raya Insurance	Building, Element of district	Historic	HP06 (1-3 story commercial building)	2009 (S. Francisco, S. Edwards, and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188701		Resource Name - Alley between McGroarty St & 400 block of S Mission Dr; Other - Map Reference #3-75	Structure, Element of district	Historic	HP39 (Other)	2009 (S. Edwards and F. Smith, SWCA Environmental Consultants)	LA-10513
P-19-188836		OHP Property Number - 034762; Resource Name - Mission Playhouse; Other - San Gabriel Civic Auditorium	Building	Historic	HP12 (Civic auditorium)	1985 (Diane Hlava, L.A. County Comm. Dev. Comm.)	
P-19-189870		OHP Property Number - 034766; Resource Name - Ortega Vigare Adobe; Other - Doña Luz Vigare Residence; Other - Muños House; CHL - 451; Other - HABS (CA 37-8-A)	Building, Element of district	Historic	HP44 (Adobe building/structure)	1949; 1959 (Wendell K. Davis, Division of Beaches & Parks District 6); 1979 (Jim Arbuckle); 1990 (Annette Kondo, Pasadena Star News); 2009 (S. Carmack and F. Smith, SWCA Environmental Consultants)	
P-19-190564		Resource Name - UPRR Culvert West of Ramona	Structure	Historic	HP11 (Engineering structure)	2013 (John Dietler and Sam Murray); 2017 (Alyssa Newcomb, SWCA)	

Appendix B

Native American Scoping

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100 West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

April 25, 2019

Lindsay Porras
Rincon Consultants, Inc.

VIA Email to: lporras@rinconconsultants.com

RE: Arroyo Village Project, #19-07364, Los Angeles County.

Dear Ms. Porras:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Gabrielino /TongvaSan Gabriel Band of Mission Indians and Gabrieleno Band of Mission Indians-Kizh Nation on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: katy.sanchez@nahc.ca.gov .

Sincerely,

Katy Sanchez

KATY SANCHEZ
Associate Environmental Planner

Appendix C

California DPR 523 Series Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** 235 South Arroyo Drive

P1. Other Identifier: 35 Hampton Circuit

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

***b. USGS 7.5' Quad:** *M nte* **Date:** 1995 Township, Range, Section M.D.**B.M.**

c. Address: 235 South Arroyo Drive City: San Gabriel Zip: 91776

d. UTM: Zone: mE/ mN (G.P.S.)

e. Other Locational Data: APNs 5346-011-006; 5346-011-001

***P3a. Description:**

The subject property at 235 South Arroyo Drive contains a single residence that is accessible via Hampton Circuit. A concrete walkway breaks from the driveway and provides a circuitous entrance to the residence. The building features a concrete foundation that sits on a hill, allowing for the residence to be a single-story in the front and two-stories in the rear. A hipped roof clad in composition shingles with exposed rafter tails caps the building above a rough-texture stucco-clad exterior. The building has a 'T'-shaped footprint and brick chimney breaks the primary façade between the building's two entrances. The primary entrance is accessible via the driveway and is characterized by its entry porch. This entry porch features the overhanging eave of the roofline supported by a single wood column. The secondary entrance also features a projecting roofline upheld by squared wood columns and accessible via three low concrete steps. Fenestration along the primary façade is comprised of unoriginal vinyl windows set in wood surrounds.

(*ee nt nuat n eet a e*)

***P3b. Resource Attributes:** HP2. Single Family Property

***P4. Resources Present:** ■ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (*See Continuation Sheet page 4*)

n n n u tant

P5b. Description of Photo:
Primary (northern) façade, camera facing southeast. June 2019.

***P6. Date Constructed/Age and Sources:**
■ Historic ☐ Prehistoric ☐ Both

Constructed in 1947

***P7. Owner and Address:**
Arroyo Development LLC
235 South Arroyo Drive
San Gabriel, CA 91776

***P8. Recorded by:**
Alexandra Madsen
Rincon Consultants
250 E. 1st Street, Suite 1400
Los Angeles, CA 90012

***P9. Date Recorded:**
June 7, 2019

***P10. Survey Type:**
Intensive

***P11. Report Citation:**

Porras, L., B. Campbell-King, C. Duran, and A. Madsen. 2019. *a e u tura e ur e e ment r t e rr a e e dent a nd m n um r e t t an a r e L n e e unt a rn a*. Rincon Consultants Project No. 19-07364. Report on file at the South Central Coastal Information Center, California State University, Fullerton.

***Attachments:** ☐ NONE ■ Location Map ■ Sketch Map ■ Continuation Sheet ■ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

State of California X Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

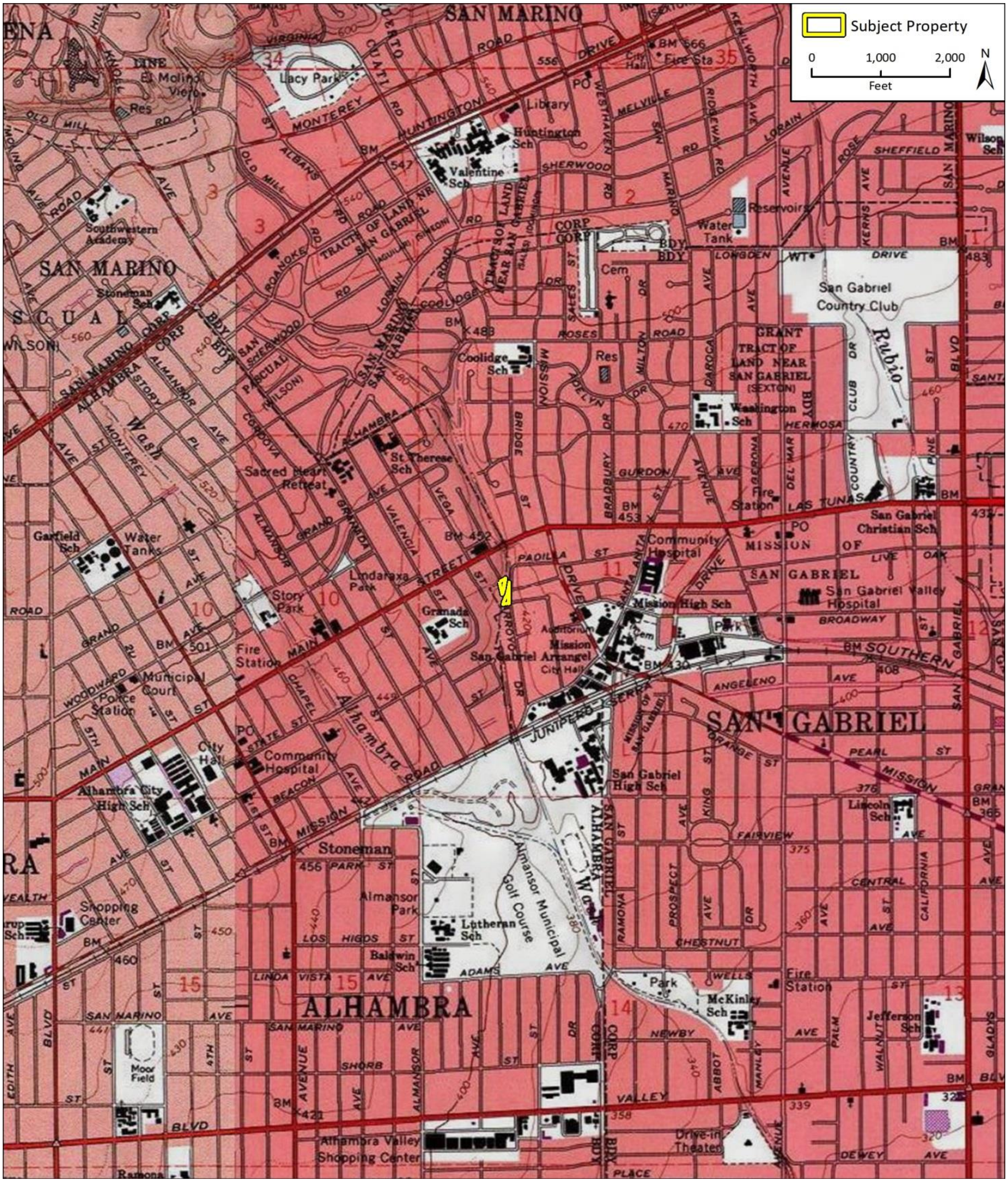
LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or #** 235 South Arroyo Drive

***Map Name:** *M nte*

***Scale:** 1:24,000 ***Date of map:** 1995



State of California X The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** 235 South Arroyo Drive ***NRHP Status Code** 6Z

B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Single Family Residence B4. Present Use: Single Family Residence
***B5. Architectural Style:** Vernacular; Modified Ranch
***B6. Construction History:**

A building permit was issued on April 28, 1947 for the erection of the subject single-family residence. The permit lists the owner and contractor as Charles Terry and describes the building as a 3-bedroom dwelling and garage with storage room. No additional permits were available. However, it appears that the building has been dramatically altered over the last decades with new, vinyl windows; rough-texture stucco cladding; and rear additions. It appears the building is currently being used as a multi-family residence.

***B7. Moved?** ■ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None
B9a. Architect: None b. Builder: Charles Terry
***B10. Significance: Theme** N/A **Area** N/A
Period of Significance N/A **Property Type** N/A **Applicable Criteria** N/A

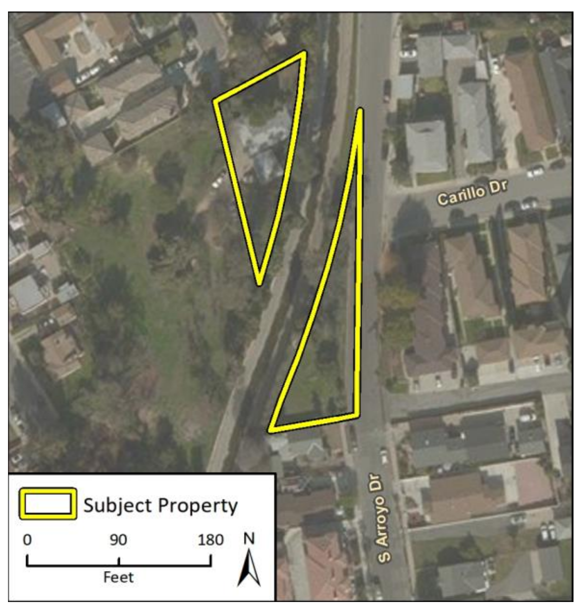
According to the building permit record, the single-family residence situated at the subject property was constructed circa 1947 by Charles Terry. Charles Terry, a carpenter, and Eva Terry were listed as residing at the subject property from the time of the residence's construction in 1947 to 1967 (Los Angeles County Assessor Records). In 1971, Eva Terry was listed as residing at the property (Polk's San Gabriel City Directory). The residence was listed for sale in 1974 and advertised a "park like setting" (Arcadia Tribune 1974). The subject property's current setting is mixed; properties surrounding the residence are mostly comprised of single- and multi-family residences and commercial buildings.

Evaluation

The subject property is ineligible for listing in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or San Gabriel Register of Cultural Resources (San Gabriel Register) pursuant to any applicable designation criteria. The subject property was constructed in 1947 in an area bordering the cities of San Gabriel and Alhambra. Research did not suggest the residence is associated with an event or series of events that made a significant contribution to the broad patterns of history in the city, region, state, or nation (Criteria A/1/1). Builder and owner Charles Terry was a carpenter and resided at the residence for over 25 years. Research did not indicate he or any other persons associated with the residence can be considered significant to local, state, or national history (Criteria B/2/2). The subject property contains a modified Ranch-style residence that has undergone extensive alterations. The residence does not embody distinctive characteristics of a type, period, or method of construction (Criteria C/3/3). A review of available evidence and records search results did not indicate the property is might yield information important to history or prehistory (Criteria D/4/4). (*ee nt nuat n eet a e*)

B11. Additional Resource Attributes: N/A
***B12. References:**

Arcadia Tribune. 1974. "Open House." July 7.
City of San Gabriel. Building Permit No. Unknown. April 28, 1947.
City of San Gabriel. 2004. *u d n n a r ud a t M n tr t e an* Accessed on June 3, 2019 at http://www.sangabrieled.com/212/Mission-District-Specific-Plan
Los Angeles, County: Office of the Assessor. "Property Assessment Information System." http://maps.assessor.lacounty.gov/. Accessed October 2018.
National Park Service. 1995. How to Apply the National Register Criteria for Evaluation. National Register Bulletin. U.S. Department of the Interior.
R.L. Polk & Co. 1962, 1964, 1967, and 1971. *Polk's San Gabriel City Directory.* Ancestry.com. Accessed online June 3, 2019.



B13. Remarks:
***B14. Evaluator:** Alexandra Madsen, Rincon Consultants
***Date of Evaluation:** June 7, 2019

(This space reserved for official comments.)

State of California — The Resources Agency | **Primary #**
DEPARTMENT OF PARKS AND RECREATION | **HRI#**
CONTINUATION SHEET
Trinomial

 ***Resource Name or #** 235 South Arroyo Drive

***Recorded by:** Alexandra Madsen, Rincon Consultants ***Date:** June 7, 2019 ■ Continuation ☐ Update

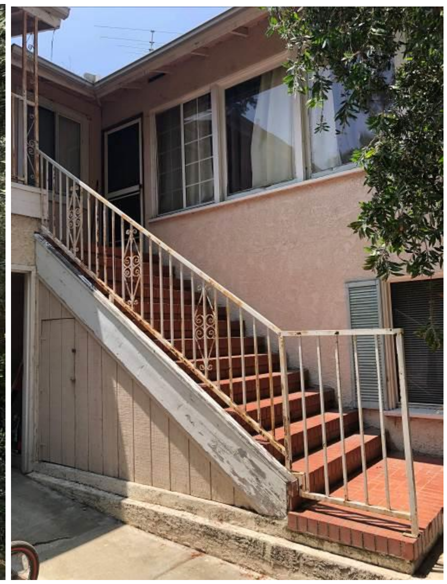
***P3a. Description:** (*nt nued r m r mar e rd a e*

The western façade of the residence features a rear addition with vertical clapboard siding, aluminum sliding windows, and a flat roof with an overhanging eave. The lower story of the addition serves as a 2-car garage with stucco siding. To the south, the two bays of the building open to a brick staircase that provides entry to building at what appears to be a rear living unit. A ribbon of vinyl windows along the second story features vinyl sliding and casement windows.

A secondary addition is situated on the eastern end of the southeastern bay of the residence. This addition features a sliding aluminum window, vertical clapboard siding, and a door with decorative screen. This addition is situated immediately adjoining the Alhambra Wash with no setback.

P5a. Photo or Drawing: (*nt nued r m r mar e rd a e*

Western a ade and Garage Addition



Rear Staircase

Southern a ade

Secondary Rear Addition

(*ee nt nuat n eet a e*

***Resource Name or #** 235 South Arroyo Drive

***Recorded by:** Alexandra Madsen, Rincon Consultants ***Date:** June 7, 2019 ■ Continuation ☐ Update

P5a. Photo or Drawing: (*nt nued r m nt nuat n eet a e*

Setting

***B10. Significance:** (*nt nued r m u d n tru ture and e t e rd a e*)

The subject property at 235 South Arroyo Drive is technically located in the City of San Gabriel; however, the property is accessible via Hampton Circuit, a small cul-de-sac street that branches off of Main Street in Alhambra. Main Street is a highly commercial corridor with a large 3-story shopping plaza at the mouth of Hampton Circuit. The setting of the subject property along Hampton Circuit is characterized by single and multi-family residences. Small post-war houses along the eastern side of the street are contrasted by larger multi-family residences dating to the 1980s and 2000s on the western side. The circuit is thus characterized by in-fill development as larger housing types have come to replace earlier, single-family residences. For this reason, the neighborhood does not retain integrity and is not characterized by a cohesive development pattern or architectural style. The subject property, although technically situated in San Gabriel is not highly visible from the city because of its location across the Alhambra Wash. Foliage and distance make the residence unlikely to impact visual sightlines in the City of San Gabriel.

State of California — The Resources Agency **DEPARTMENT OF PARKS AND RECREATION** **PRIMARY RECORD**		**Primary #** **HRI #** **Trinomial** **NRHP Status Code**
	Other Listings **Review Code**	**Reviewer** **Date**

 ***Resource Name or #:** Segment of the Alhambra Wash

P1. Other Identifier: N/A
***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** *M nte* **Date:** 1995 Township, Range, Section M.D.**B.M.**
c. Address: 235 South Arroyo Drive City: San Gabriel Zip: 91776
d. UTM: Zone: mE/ mN (G.P.S.)
e. Other Locational Data: Part of APN 5346-011-004

***P3a. Description:**
The subject resource is an approximately 370-foot-long segment of the Alhambra Wash, a 7.2-mile-long utilitarian channelized stream that runs from Huntington Drive to the Rio Hondo. This segment is characterized by its reinforced concrete slab base and concrete channel walls, which are in turn topped by a chain link fence. The wash base is slightly sloped, allowing water to collect in the center of the body. Circular pipe scuppers are placed along the wash to ensure even distribution of draining water in times of flood. The Alhambra Wash is a rectangular reinforced concrete channel that serves as a tributary of the Rio Hondo. The wash features various culverts and is crossed by 8 bridges, including those at Roses Road, Las Tunas Drive, and New Avenue. The wash drains over 14 square miles of high developed areas in the cities of San Gabriel, Pasadena, San Marino, and Alhambra. The segment of the wash analyzed includes part of the wash encompassed in APN 5346-011-004.
(*ee nt nuat n eet a e*)

***P3b. Resource Attributes:** HP20. Canal; HP22. River
***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing

P5b. Description of Photo:
View of Alhambra Wash, facing south. June 2019.

***P6. Date Constructed/Age and Sources:**
■Historic ☐Prehistoric ☐Both
1927-1938
(*L n e e me* U.S. Army Corps of Engineers; Historic Aerials)

***P7. Owner and Address:**
U.S. Army Corps of Engineers
Los Angeles District

***P8. Recorded by:**
Alexandra Madsen
Rincon Consultants
250 E. 1st Street, Suite 1400
Los Angeles, CA 90012

***P9. Date Recorded:**
June 7, 2019

***P10. Survey Type:**
Intensive

***P11. Report Citation:**

Porras, L., B. Campbell-King, C. Duran, and A. Madsen. 2019. *a e u tura e ur e e ment r t e rr a e e dent a nd m n um r e t t an a r e L n e e unt a rn a*. Rincon Consultants Project No. 19-07364. Report on file at the South Central Coastal Information Center, California State University, Fullerton.

***Attachments:** ☐NONE ■Location Map ■Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ■Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

 ***Resource Name or #:** Segment of the Alhambra Wash

L1. Historic and/or Common Name: Segment of the Alhambra Wash

L2a. Portion Described: ☐ Entire Resource ■ Segment ☐ Point Observation **Designation:** 6Z

b. Location of point or segment: (Provide UTM coordinates, decimal degrees, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.) Portion of APN 5346-011-004.

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.) The subject segment of the Alhambra Wash is reinforced concrete and is characterized by its slightly sloping sides. This segment of the wash is open, whereas other sections are fully covered or traversed by bridges.

L4. Dimensions: (In feet for historic features and meters for prehistoric features) Dimensions are approximations based on the wash's engineering plans

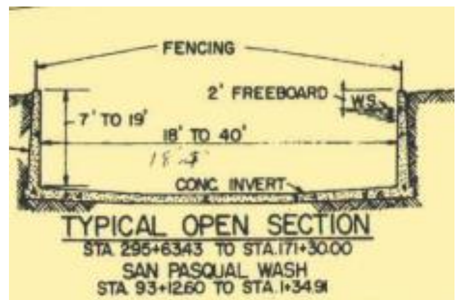
- **a. Top Width** 18-40 feet
- **b. Bottom Width** 18-40 feet
- **c. Height or Depth** 7-19 feet
- **d. Length of Segment** 370 feet (linear; of 7.2 miles)

L5. Associated Resources: N/A

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.): The setting is characterized by relatively level ground. Residences line both sides of the subject segment but are not highly visible due to the surrounding foliage, which includes shrubs and smaller trees.

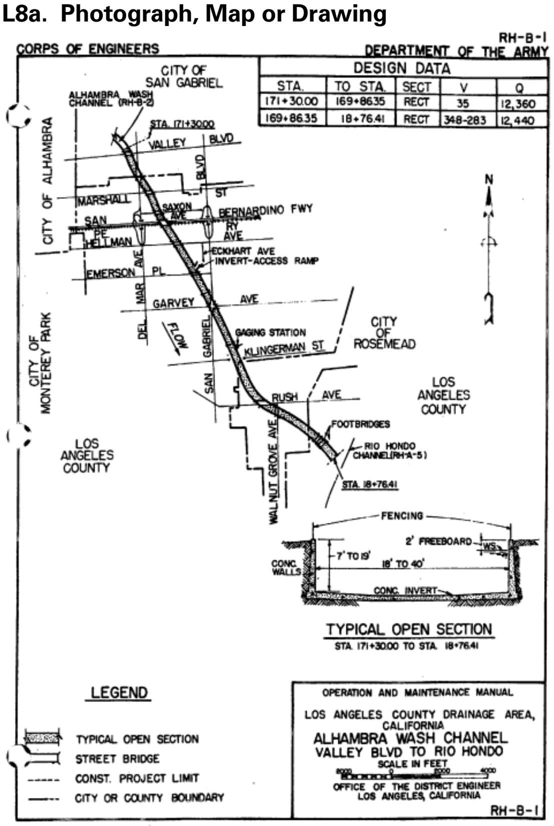
L7. Integrity Considerations: No visible alterations along segment.

L4e. Sketch of Cross-Section
Facing: n/a



igure 1. Typical Open Section of Alhambra Wash. Excerpt from *erat n Ma ntenan e e a r e a ement and e a tat n Manua* , 1999, Data Sheet RH-B-1. June 1938. U.S. Army Corps of Engineers. *erat n and Ma ntenan e Manua* 1999.

L8a. Photograph, Map or Drawing



igure 2. Alhambra Wash. Excerpted from *erat n Ma ntenan e e a r e a ement and e a tat n Manua* , 1999, Data Sheet RH-B-1. June 1938. U.S. Army Corps of Engineers. *erat n and Ma ntenan e Manua* 1999.

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)

Map of Alhambra Wash route and bridges.

L9. Remarks: N/A

L10. Form Prepared by: (Name, affiliation, and address)

Alexandra Madsen
Rincon Consultants
200 E. 1st Street, Suite 1400
Los Angeles, CA 90012

L11. Date: June 7, 2019

Primary #
HRI#
Trinomial

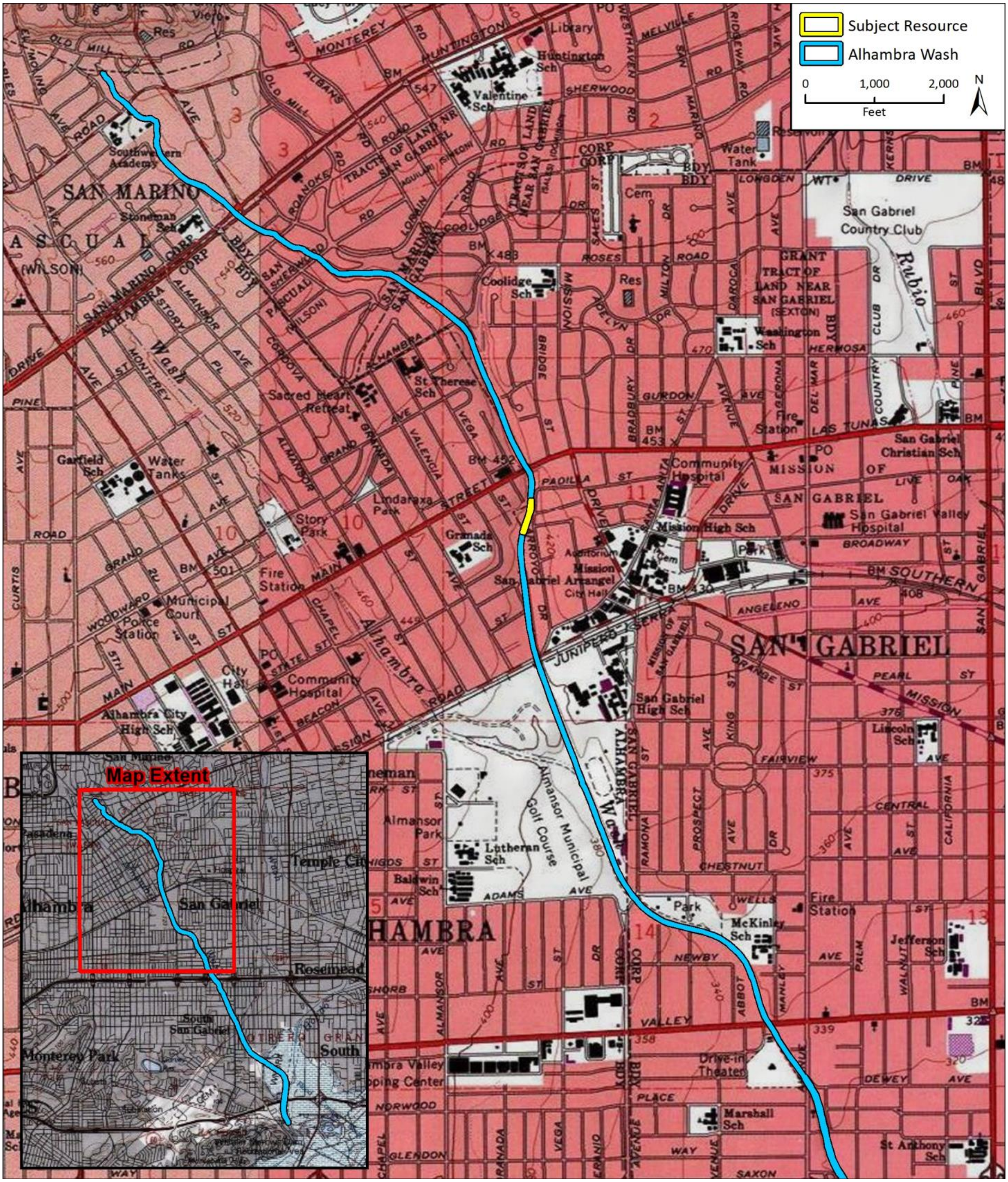
LOCATION MAP

***Resource Name or #:** Segment of the Alhambra Wash

***Map Name:** M nte

***Scale:** 1:24,000

***Date of Map:** 1995



*Required information

BUILDING, STRUCTURE, AND OBJECT RECORD

B1. Historic Name: Alhambra Wash
B2. Common Name: Alhambra Wash
B3. Original Use: Flood Control   B4. Present Use: Flood Control
***B5. Architectural Style:** N/A
***B6. Construction History:**

Approximately the first mile of the Alhambra Wash was constructed in 1921. The other 6 miles were completed incrementally between 1927 and 1938. Additional improvements were completed in 1947, 1953, 1955, and 1962. The subject segment of the Alhambra Wash does not appear to have been altered or received recognizable updates since its time of construction.

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** N/A

B9a. Architect: Unknown   b. Builder: Unknown
***B10. Significance: Theme:** N/A   **Area:** N/A
Period of Significance: N/A   **Property Type:** N/A   **Applicable Criteria:** N/A

Prior to the harnessing of the Alhambra Wash, the Mission San Gabriel built over 20 miles of aqueducts. These aqueducts sufficed for early settlers but would oftentimes flood during the wet season. As the population grew in San Gabriel at the turn of the century, there was an increased demand for flood measures. The Alhambra Wash was not one of these earlier aqueducts but was rather constructed during the mass channelization of rivers in the early 20th century. As the Water Conveyance Systems in California Historic Context states:

t e and ut ern a rn a mmun t e a r a n u u e t e r e t n mun a ater u e t k d erent re n e t t e erenn a r em ater rta e nt t e ater t e rad u d e ta ed a adena and t er near t e ad d ntr d tr t and t er ater a en e n tru t rk a n t e an a r e and anta na r er and t e r ater ed t a ture t e re tat n t at e dur n t e rt ra n ea n (JRP 2000)

The Alhambra Wash is a 7.2-mile long channelized river that was developed in multiple phases. The first planning phase occurred in 1916, when the County flood control engineer estimated the cost of harnessing the Alhambra Wash at just under $10,000 as part of a county-wide effort to contain various rivers and streams (*L n e e me* 1916). Despite this early study, development of the wash was delayed in 1918 when a $4.5 million flood control bond in Los Angeles County was contested and sent to the Supreme Court of California. The court upheld the bond, allowing development of the wash to officially begin that same year (*ut e t u der and ntra t r* 1918).
(*ee nt nuat n eet a e*)

B11. Additional Resource Attributes: HP19. Bridge

***B12. References:**

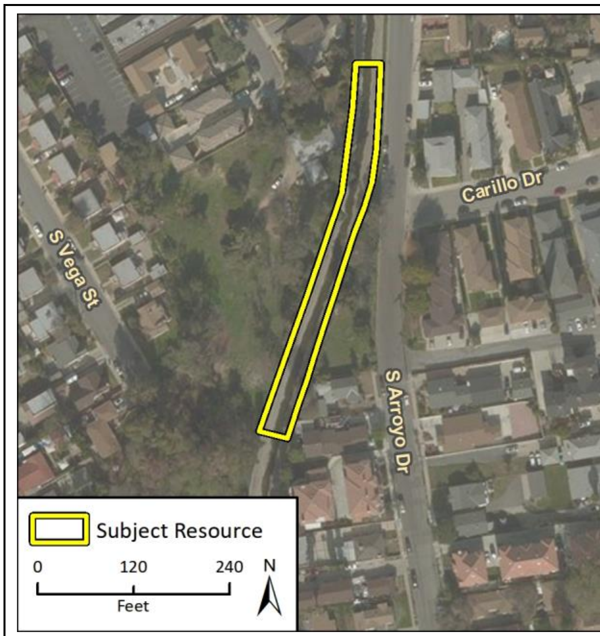
(*ee nt nuat n eet a e*)

B13. Remarks: N/A

***B14. Evaluator:** Alexandra Madsen, Rincon Consultants, Inc.

***Date of Evaluation:** June 7, 2019

(This space reserved for official comments.)



***B10. Significance:** (*nt nued r m u d n tru ture and e t e rd a e*

In 1921, a newspaper article recorded the channelization of the first mile of the Alhambra Wash (*L n e e me* 1921). The consequential development of the remaining 6 miles of the wash occurred between 1927 and 1938. In 1927, the area from Alhambra to the mouth of wash was created as an emergency flood control district (*L n e e me* 1927). A flood in 1931 emphasized the need for the wash to feature more concrete channels to protect the city from flooding. Consequently, the wash received numerous improvements from 1934 to 1937.

Although archival records did not provide the wash's exact year of completion, historic aerials show that the remaining 6 miles of the wash were constructed between 1927, when aerials evidence an untamed river, and 1938, when the wash was channelized. Historic aerials captured the pre- and post-channelization of the subject segment of the Alhambra Wash from these years (Figures 3a-b; .

Figures 3a-b.
Map of Alhambra Wash Prior to Channelization, December 31, 1927
Map of Alhambra Wash Post-Channelization, June 5, 1938

In October of 1938, the County Flood Control District officially adopted the Alhambra Wash and completed several alterations along the channel (U.S. Army Corp of Engineers 1999). After the initial stages of development from 1918-1921 and 1927-1938, the Alhambra Wash received numerous periodic updates and improvements to ensure that safety and efficiency measures were met. In 1955, the Alhambra-Monterey Park storm drain was constructed, which included a line from Emerson Avenue to the Alhambra Wash channel. In 1962, the U.S. Army Corps of Engineers completed additional unspecified updates along the wash (U.S. Army Corp of Engineers 1962). The Alhambra Wash is owned and managed by the United States Army Corps of Engineers.

The City of San Gabriel's 2004 Mission District Specific Plan recognizes the Alhambra Wash as a landscape feature of cultural value. The city has resolved to "develop strategies to ensure that the Alhambra Wash will be included in any regional program for restoring the natural condition of the waterway and utilizing it as a recreational or open space facility." These guidelines identify the wash's significance to not be based on its engineered construction, but rather in the waterway's "natural condition" (City of San Gabriel 2004).

To provide additional context in which to understand any potential significance of the Alhambra Wash, this evaluation references *ater n e an e tem n a rn a t r nte t e e ment and a uat n r edure* (JRP 2000). This document sets forth guidelines for the appropriate consideration of water conveyance systems, including canals, ditches, and aqueducts. The context identifies "water conveyance systems" as structures designed to move water from one place to another and identifies the most common types of systems as those that conveyed water for irrigation, mining, communities, hydroelectric power production, reclamation, and large multi-purpose systems. According to the context, the subject property would fall within the Community Development Theme, which discusses systems that were used to bring water into California communities, from densely populated urban areas to small, rural towns. The context recognizes shared themes and technologies, but also acknowledges that most regions were unique in their patterns of development. While some communities had publicly owned reservoirs, others allowed the privatization of streams by the means of pipes. Chlorination plants thrived in some communities, like Sacramento, while others piped in water from far-away water sources, like the Tuolumne River to San Francisco. This context provided insight regarding the potential significance of water conveyance systems in communities and their development.
(*ee nt nuat n eet a e*)

***B10. Significance:** (*nt nued r m nt nuat n eet a e*

Evaluation for Eligibility

As established in the Water Conveyance Systems in California Historic Context, when a property is evaluated for significance it may apply to an entire water conveyance system or only to the portion of the system in the project area (JRP 2000). For this reason, the below evaluation is limited in scope to the 370-foot segment of the Alhambra Wash that transects the subject parcel.

The subject property is ineligible for listing on the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or San Gabriel Register of Cultural Resources (San Gabriel Register) pursuant to any applicable designation criteria. The segment of the Alhambra Wash was not found to be associated with specific important events or important patterns of events in the history of the city, region, state, ore nation (Criteria A/1/1). Per the Water Conveyance Systems in California Historic Context, systems eligible under this criterion must have a direct association with specific important events such as the first long-distance transmission of hydroelectric power, or a pattern of events such as the development of irrigated farming. The system was one of many to be developed in southern California during the first decades of the twentieth century to expand a rapidly growing population. The property was constructed gradually between 1927 and 1938 and was not one of the earliest or most important means of water conveyance in the San Gabriel Valley, but rather served the general community of the surrounding area as one of multiple tributaries of the Rio Hondo.

Research did not suggest the segment of the Alhambra Wash is associated with an important person who made demonstrably important contributions to local, state, or national history (Criteria B/2/2). Additionally, the segment of the Alhambra Wash is not the earliest, best preserved, largest, or sole surviving example of a particular type of water conveyance system. Nor did this property introduce a design innovation that reflected an evolutionary trend in engineering. Instead, the property is a ubiquitous and utilitarian concrete-lined water conveyance system that was constructed during the boom of the channelization of rivers in southern California during the early decades of the twentieth century (Criteria D/4/4). A review of available evidence and records search results did not indicate the property is might yield information important to history or prehistory (Criteria D/4/4).

B12. References: (*nt nued r m u d n tru ture and e t e rd a e*

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APPENDIX E
Geotechnical Investigation

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental and Civil Engineering

April 17, 2019

Arroyo Development , LLC
2409 Strozier Avenue, suite A
South El Monte, California 91733

Attention: Mr. Frank Lac

Subject: Report Update, 235 S. Arroyo Drive, APN: 5346-011-004, San Gabriel, California, Project No.: 14-010-024a

References: "Report of Geotechnical Engineering Investigation, Proposed 4-Story Residential Development, 235 S. Arroyo Drive, APN: 5346-011-004, San Gabriel, California" by Cal Land Engineering, Inc., Project No. 14-010-024a dated June 11, 2015.

Gentlemen:

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in Southern California, which is a tectonically active area. Based on the ASCE 7-10 Standard, CBC 2016, the following seismic related values may be used:

Seismic Parameters (Latitude: 34.099906 Longitude: -118.113176)	Site Class "D"
Mapped 0.2 Sec Period Spectral Acceleration $\mathbf{S_S}$	2.806g
Mapped 1.0 Sec Period Spectral Acceleration $\mathbf{S_1}$	0.928g
Site Coefficient for Site Class "D", $\mathbf{F_a}$	1.0
Site Coefficient for Site Class "D", $\mathbf{F_v}$	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 0.2 Second, $\mathbf{S_{MS}}$	2.806g
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 1.0 Second, $\mathbf{S_{M1}}$	1.392g
Design Spectral Response Acceleration Parameters for 0.2 sec, $\mathbf{S_{DS}}$	1.871g
Design Spectral Response Acceleration Parameters for 1.0 Sec, $\mathbf{S_{D1}}$	0.928g

Peak ground acceleration (PGA), corresponding to USGS Design Map Summary Report, ASCE 7-10 Standard is 1.068g. The Project Structural Engineer should be aware of the information provided above to determine if any additional structural strengthening is warranted.

This opportunity to be of service is sincerely appreciated. Should you have any questions pertaining to this addendum, please call us.

Respectfully submitted,
Cal Land Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

REGISTERED PROFESSIONAL ENGINEER
JACK C. LEE
No. 2153
Exp. 3/31/21
GEOTECHNICAL
STATE OF CALIFORNIA

Jack C. Lee, GE 2153

Abe Kazemzadeh

June 11, 2015

Arroyo Development , LLC
2409 Strozier Avenue, suite A
South El Monte, California 91733

Attention: Mr. Frank Lac

Subject: Report of Geotechnical Engineering Investigation, Proposed 4-Story Residential Development, 235 S. Arroyo Drive, APN: 5346-011-004, San Gabriel, California. QCI Project No.: 14-010-024aGE

Gentlemen:

In accordance with your request, Quartech Consultants (QCI) has prepared this geotechnical engineering report for the proposed development at the subject site. The purpose of this report was to evaluate the subsurface conditions and to provide recommendations for foundation designs and other relevant parameters for the proposed construction.

Based on the findings and observations during our investigation, it is concluded that the subject site is suitable for its intended use from the geotechnical engineering viewpoint, provided that recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,
CalLand Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

Jack C. Lee, GE 2153
Principal

Abe Kazemzadeh
Project Engineer

Dist: (4) Addressee

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION AND

Proposed
4-Story Residential Development

At

APN: 5346-011-004
235 S. Arroyo Drive
San Gabriel, California

Prepared by

QUARTECH CONSULTANTS (QCI)

Project No.: 14-010-024aGE

June 11, 2015

TABLE OF CONTENT

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of our preliminary geotechnical engineering investigation for the proposed development at the subject site. The purposes of this investigation were to evaluate the subsurface conditions at the area of proposed construction and to provide recommendations pertinent to grading, foundation design and other relevant parameters.

1.2 Scope of Services

Our scope of services included the followings:

- Review of available soil and geologic data of the subject site and its vicinity.
- Subsurface exploration consisting of logging and sampling of two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing grade at the subject site. The exploration was logged by a QCI engineer. Boring logs are presented in Appendix A.
- Laboratory testing of representative samples obtained from the subject site to investigate engineering characteristics of the onsite soils. The laboratory test results are presented in Appendix B (Laboratory Testing) and on the boring logs (Appendix A).
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Preparation of this report to present our findings, conclusions, and recommendations for the proposed construction.

1.3 Proposed Construction

Based on the provided information, it is our understanding that the subject site will be developed for construction of a 46 condominium units. The main structure of the building is anticipated to be four stories in height above the ground level with one level of subterranean garage. The lowest garage floor will be approximately 10 feet below the existing ground surface. The subterranean garage will occupy the entire building site. No detail design structural loads were available at the time when this report was prepared.

1.4 Site Location

The project site is located at the west of Arroyo Drive and Alhambra Wash, between southwest Hampton Court and northeast Vega street in the City of San Gabriel, California. The approximate location of the site is presented in the attached Site Location Map (Figure 1). The existing drainage channel "Alhambra Wash" is located east of the site and west of Arroyo Drive. Detailed configuration of the site is presented in the attached Site Plan, Figure 2.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration

Our subsurface exploration consisted of excavating two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing ground surface at the subject site. Approximate locations of the borings are shown on the attached Site Plan (Figure 2). The purpose of the explorations was to assess the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were logged by a representative of this office. Relatively undisturbed and bulk samples were collected during drilling for laboratory testing. Natural soil was encountered in the borings to the depths explored. Boring logs are presented in Appendix A.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, consolidation, direct shear strength, Atterberg Limits, percent fines, expansion and corrosion potential. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are provided on the boring logs (Appendix A).

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Soil Conditions

The onsite near surface soils consist predominantly of silty sand (SM). In general, these soils exist in medium dense and slightly moist condition. Underlying the surface soils, silty sand (SM), and sand/silty sand mixtures (SP-SM), were disclosed in the borings to the depths explored (51.5 feet below the existing ground surface). These soils exist in the slightly moist to moist conditions. The soils become denser as depth increases.

3.2 Groundwater

No groundwater was encountered in the borings to the depths explored (51.5 ft.). Based on our review of the "Historically Highest Ground Water Contours and Borehole Log Data Locations, El

Monte Quadrangle", by CDMG, it is estimated that the highest ground water level is approximately 140 to 150 feet below the existing grade. It should be noted that the CDMG ground water map is obtained by evaluating technical publications, geotechnical borehole data, water-well logs dating back to the "turn-of-the-century". This report also indicated that ground water levels in the areas from 1960-1997 data are generally 5 to 50 feet deeper than the earlier measured data. No specific date was provided pertaining to the high ground water level.

4.0 SEISMICITY

4.1 Faulting

Based on our study, there are no known active faults crossing the property. The nearest known active regional fault is the Raymond Fault zones located approximately 1.6 miles from the site.

4.2 Seismicity

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting the site depend on the distance to causative faults, the intensity, and the magnitude of the seismic event. Table 1 indicates the distance of the fault zones and the associated maximum magnitude earthquake that can be produced by nearby seismic events. As indicated in Table 1, the Raymond Fault zones are considered to have the most significant effect to the site from a design standpoint.

TABLE 1

Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (mile)	Maximum Magnitude Earthquake (Mw)
Raymond	1.6	6.8
Elysian Park (Upper)	2.3	6.7
Verdugo	3.2	6.9
Sierra Madre	5.8	7.2
Hollywood	6.9	6.7
Elsinore-W	8.1	7.0
Clamshell-Sawpit	8.4	6.7
Puente Hills (LA)	9.1	7.0
Santa Monica	9.9	7.4
Puente Hills (Santa Fe Spring)	12.7	6.7
San Jose	14.0	6.7
Puente Hills (Coyote Hills)	14.8	6.9
Newport-Inglewood,Conn. alt 2	15.8	7.5

References: 2008 National Seismic Hazard Maps-Source Parameters

4.3 Estimated Earthquake Ground Motion

In order to estimate the seismic ground motions at the subject site, QCI has utilized the seismic hazard map published by California Geological Survey. According to this report, the peak ground alluvium acceleration at the subject site for a 2% and 10% probability of exceedance in 50 years is about 1.034g and 0.595g respectively (NSHMP, 2008 Deaggregation of Seismic Hazards).

5.0 CONCLUSIONS

Based on the results of our subsurface investigation, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction. The following is a summary of the geotechnical design and construction factors that may affect the development of the site:

5.1 Seismicity

Based on our studies on seismicity, there are no known active faults crossing the property. However, the site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California.

5.2 Seismic Induced Hazards

Based on our review of the "Seismic Hazard Zones, El Monte Quadrangle" by California Department of Conservation, Division of Mines and Geology, it is concluded that the site is not located in the mapped potential liquefaction areas.

5.3 Excavatability

Based on our subsurface investigation, excavation of the subsurface materials should be accomplished with conventional earthwork equipment.

5.4 Surficial Soil Removal

The near surface soils are relatively dry and vary in density. In order to provide a uniform support for the foundation, it is recommended the existing soil be removed and backfilled with compacted fill to a minimum depth of 4 feet below the existing grade to provide a uniform support of the structures.

5.5 Groundwater

Groundwater was not encountered during our field exploration. Groundwater is not anticipated to be encountered during the near surface construction.

6.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

6.1 Grading

6.1.1 Site Preparation

Prior to initiating grading operations, any existing vegetation, trash, debris, over-sized materials (greater than 8 inches), and other deleterious materials within construction areas should be removed from the subject site.

6.1.2 Surficial Soil Removals

It is anticipated that most unsuitable or and loose near surface soils will be removed by excavation for the subterranean parking structures. It is recommended that the subterranean garage areas be cut to grade then observed by a representative of this office to verify the sub-grade soil conditions. Outside the building areas, the near surface soils are loose and weathered and should be removed to expose competent natural soils.

6.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to minimum project standards.

6.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. Fills should be placed in relatively thin lifts (6 to 8 inches), brought to near optimum moisture content, and compacted to at least 90 percent relative compaction based on laboratory standard ASTM D-1557-09.

6.2 Subterranean Garage Excavation

The required excavation for the proposed subterranean garage will extend to a maximum of approximately 10 to 12 feet below the existing ground surface. The excavation will have minor impact to the adjacent structures. The criteria for sloped excavations and/or shoring method for the alignments required vertical cuts, depends on many factors, which include depth of excavation, soil conditions, types of shoring, distance to the existing structures or public improvement, consequences of potential ground movement, and construction procedures.

6.2.1 Sloping Excavation

Should the space be available at the site, the required excavation may be made with sloping banks. Based on materials encountered in the test borings, it is our opinion that sloped excavations may be made no steeper than 3/4:1 (horizontal to vertical) for the underlying native soils. Flatter slope cuts may be required if loose soils encountered during excavation. No heavy construction vehicles, equipment, nor surcharge loading should be permitted at the top of the slope. A representative of this office should inspect the temporary excavation to make any necessary modifications or recommendations.

6.2.2 Shoring

Shoring will be required for temporary excavation made vertically or near vertically. An active earth pressure of 26 pound per cubic foot may be used for the temporary cantilever shoring system. Any surcharged loads resulting from the adjacent building or the traffic in the adjacent street or alley should be considered as an added loads to the above recommended. The upper 10 feet of the shoring is recommended to be designed to resist an additional pressure of 200 pounds per square ft. resulting from the traffic in the adjacent street. Soldier piles or beams should be spaced at the required distance specified by the project structural/shoring engineer. Lagging may be required to span between soldier piles to support the lateral earth pressure.

The shoring and bracing should be designed and constructed in accordance with current requirements of CAL/OSHA and all other public agencies having jurisdiction. Careful examination of the soil excavation and inspection of on-site installation of the shoring system by a representative of this office is recommended to verify the conditions or to make recommendations as are pertinent if different conditions are disclosed during excavation.

6.3 Foundation Design

Based on our subsurface investigation, it is our opinion that the proposed building may be supported on shallow foundation. For fill composed of the onsite soil materials and graded in accordance with the recommendations of this report, construction of concrete slab-on-grade with conventional shallow foundation structures is feasible from the geotechnical engineering viewpoint. The following presents our preliminary recommendations:

6.3.1 Conventional Shallow Foundation

An allowable bearing value of 2000 pounds per square foot (psf) may be used for design of continuous or pad footings with a minimum of 18 or 24 inches in width, respectively. All footings should be a minimum of 18 inches deep and founded on soils approved by the project geotechnical engineer. This bearing value may be increased by 200 psf for each additional foot of depth or width to a maximum value of 2500 psf. This value may be increased by one third (1/3) when considering short duration seismic or wind loads.

Resistance to the lateral loads can be assumed to be provided by the passive earth pressure and the friction between the concrete and competent soils. Passive earth pressure may be computed as an equivalent fluid pressure of 300 pcf, with a maximum earth pressure of 2000 psf. An allowable coefficient of friction between soil and concrete of 0.30 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3).

6.3.2 Lateral Pressures

Active earth pressure from horizontal backfill may be computed as an equivalent fluid weighting of 35 pounds per cubic foot for cantilever retaining wall and 60 pcf for restrained retaining wall. This value assumes free-draining conditions.

The effect of surcharge, such as traffic loads, adjacent building loads, and etc. within a 1 to 1 projection from the inner edge of the foundation should be included in the design of the retaining walls. For a uniformly disturbed load behind the wall, a corresponding uniformly distributed lateral soil pressure equal to 30 percent of the surcharged should be added to the equivalent fluid pressure.

6.3.3 Seismic Loading

Active earthquake earth pressure distribution on retaining walls retaining more than 6 feet of soils when the slope of the backfill behind the wall is level may be computed as an inverted right triangle with 32H psf at the top (where H is the height of the walls). The earthquake induced earth pressure may be applied as an inverted triangle (inverted equivalent fluid pressure) with largest dynamic earth pressure occurring at the top of the wall (upper ground surface). Resultant seismic earth force may be applied at approximately 0.6xH from the bottom of the wall.

6.4 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. The following presented our recommendations for the foundation construction.

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. All footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings.

6.5 Concrete Slab

Concrete slab should be founded on properly placed compacted fill or competent natural soils approved by the project geotechnical consultant. All disturbed soils within the concrete slab areas should be removed to exposed competent natural soils then backfill with compacted fills to the design grade. Concrete slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 reinforcing bar spaced 18-inch each way or its equivalent. All slab reinforcement should be supported to ensure proper positioning during placement of concrete.

In order to comply for the moisture sensitive area with the requirements of the 2013 CalGreen Section 4.505.2.1, a minimum of 4-inch thick base of ½ inch or larger clean aggregate should be provided with a vapor barrier in direct contact with concrete. A 10-mil Polyethylene vapor retarder, with joints lapped not less than 6 inches, should be placed above the aggregate and in direct contact with the concrete slab. The above foundation and concrete flatwork reinforcement recommendations are presented in accordance with the geotechnical engineering viewpoint. Additional reinforcement may be required in the concentrated column and/or traffic loading areas. Final reinforcement should be designed by the project structural engineer.

6.6 Retaining Wall Drainage

Walls should be backfilled with compacted fill. A free-drainage, selected backfill materials (Sand Equivalent of 30 or greater), at least 2 feet wide should be used against the wall. Onsite soil materials should be used for the upper 18 inches of the wall backfill.

A drainage system should be placed around the perimeter of the foundation or the basement walls. The system should be consist of a four-inch diameter perforated ABS SDR-35 or PVC Schedule 40, and similar non-perforated outlet pipe. The perforated portion of the pipe should be embedded in at least one cubic foot per linear foot of 3/4 inch crushed rock or its equivalent and wrapped in filter fabric. The installation of the subdrainage system should be observed by the project geotechnical engineer. The bottom of the recommended drainage system should not be higher than the bottom of the base under the basement floor. The subdrain pipe should discharge by gravity or mechanical means into the approved drainage system that compiled with the current plumbing code in accordance with the current City Building Code. Specific gradients, pipe routing and outlet locations, should be designed by the project civil engineer.

6.7 Temporary Excavation and Backfill

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-09. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

7.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction.
- Utility trench backfill.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

8.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in southern California, which is a tectonically active area. Based on ASCE 7 –10 Standard (CBC 2013), the following seismic related values may be used:

Seismic Parameters (Latitude: 34.099906, Longitude:-118.113176)	
Mapped 0.2 Sec Period Spectral Acceleration **S_S**	2.806g
Mapped 1.0 Sec Period Spectral Acceleration **S_1**	0.928
Site Coefficient for Site Class "D", **F_a**	1.0
Site Coefficient for Site Class "D", **F_v**	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 0.2 Second, **S_{MS}**	2.806
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 1.0 Second, **S_{M1}**	1.392
Design Spectral Response Acceleration Parameters for 0.2 sec, **S_{DS}**	1.871
Design Spectral Response Acceleration Parameters for 1.0 Sec, **S_{D1}**	0.928

The Project Structural Engineer should be aware of the information provided above to determine if any additional structural strengthening is warranted.

9.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. The testing results are presented in Appendix B.

According to CBC and ACI 318-11, a "negligible" exposure to sulfate can be expected for concrete placed in contact with the onsite soils. Therefore, Type II cement or its equivalent may be used for this project. Based on the resistivity test results, it is estimated that the subsurface soils are moderately corrosive to buried metal pipe. It is recommended that any underground steel utilities be blasted and given protective coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

10.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction, which appear to be different from those disclosed by the exploratory work, this office should be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

11.0 REFERENCES

California Division of Mines and Geology, 1998, Seismic Hazard Zone Report for the El Monte 7.5-minutes Quadrangle, Los Angeles County, California Seismic Hazard Zone report 024.

www.conservation.ca.gov/cgs/rghm/psha/fault_parameters/pdf/Documents/B_flt.pdf
https://geohazards.usgs.gov/deaggint/2008/
http://eqint.cr.usgs.gov/deaggint/2008/index.php
http://earthquake.usgs.gov/research/software/
http://earthquake.usgs.gov/hazards/qfaults/
"http://geohazards.usgs.gov/deaggint/2008/Earthquake Hazards Program, Seismic Design Maps and tools", ASCE 7-10 Standard
http://www.conservation.ca.gov/cgs/shzp/pages/index.aspx

APPENDIX A
FIELD INVESTIGATION

Subsurface conditions were explored by drilling two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing grade at the subject site. The approximate boring location is shown on the enclosed Site Plan, Figure 2.

The drilling of the boring was supervised by a QCI's engineer, who continuously logged the borings and visually classified the soils in accordance with the Unified Soil Classification System. Ring and SPT samples were taken at frequent intervals. These samples taken from hollow stem drilling rig were obtained by driving a sampler with successive blows of 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

APPENDIX B
LABORATORY TESTING

During the subsurface exploration, QCI personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.010 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of two kilo-pounds (kips) per square foot, and the test results are shown on the attached Figures.

Corrosion Potential

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. These tests are performed in accordance with California Test Method 417, 422, 532, and 643. The testing results are presented below:

Sample Location	PH	Chloride (ppm)	Sulfate (% by weight)	Min. Resistivity (ohm-cm)
B-1 @ 0-5’	6.79	164	0.0010	4,600

Expansion Index

Expansion Index tests were conducted on the existing onsite near surface materials sampled during QCI’s field investigation. These tests are performed in accordance with ASTM D-4829. The testing results are presented below:

Sample Location	Expansion Index	Expansion Potential
B-1 @ 0-5’	3	Very Low

Percent Passing #200 Sieve

Percent of soil passing #200 sieve were determined for selected soil samples in accordance with ASTM D1140 standard. The test results are presented in the following table:

Sample Location	% Passing #200
B-1 @ 5’	27.2
B-1 @ 10’	10.8
B-1 @ 15’	35.6
B-1 @ 20’	38.2
B-1 @ 25’	14.3
B-1 @ 30’	47.7
B-1 @ 35’	30.6
B-1 @ 40’	14.9
B-1 @ 45’	8.5
B-1 @ 50’	10.8

Atterberg Limits

Laboratory Atterberg Limits tests were conducted on the existing onsite materials sampled during QCI’s field investigation to aid in evaluation of soil liquefaction potential. These tests are performed in accordance with ASTM D4318. The testing results are presented below:

Sample Location	USCS Class. ASTM D2488	Liquid Limit %ASTM D4318	Plastic Limit %ASTM D4318	Plasticity Index %ASTM D4318	% Passing #200
B-1 @ 15’	SM	25	NP	NP	35.6

APPENDIX F
CEQA Hazards and Hazardous Materials Memorandum

CEQA HAZARDS AND HAZARDOUS MATERIALS MEMORANDUM

To: Frank Lac, Owner, Arroyo Development LLC

From: Kristen Bogue, Michael Baker International

Date: June 6, 2019

Subject: Arroyo Village Residential Condominium Project – CEQA Hazards and Hazardous Materials Memorandum

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This CEQA Hazards and Hazardous Materials Memorandum (Memorandum) was prepared in an effort to preliminarily identify the potential for accidental conditions to occur during site disturbance activities within the boundaries of the proposed Arroyo Village Residential Condominium Project (project) for the purposes of CEQA compliance. Michael Baker International's (Michael Baker's) opinions and recommendations presented in this Memorandum, are limited to our scope of work, which included a review of available online public records (GeoTracker maintained by the State Water Resources Control Board [SWRCB] and EnviroStor maintained by the Department of Toxic Substances Control [DTSC]), as well as the State Cortese Database Listing, maintained by the California Environmental Protection Agency (CalEPA).

For the purposes of this Memorandum, the term "hazardous material" refers to both hazardous substances and hazardous waste. A material is defined as "hazardous" if it appears on a list of hazardous materials prepared by a Federal, tribal, State, or local regulatory agency, or if it possesses characteristics defined as "hazardous" by such an agency. A "hazardous waste" is a solid waste that exhibits toxic or hazardous characteristics (i.e., ignitability, corrosivity, reactivity, and/or toxicity).

PROJECT LOCATION

The City of San Gabriel (City) is located in the San Gabriel Valley of Los Angeles County, approximately 11 miles east of the Los Angeles Civic Center; refer to Exhibit 1, *Regional Vicinity*. The City consists of 4.09 square miles. Surrounding jurisdictions include the cities of San Marino and Temple City to the north, Temple City, unincorporated County of Los Angeles, and Rosemead to the east, Rosemead to the south, and Alhambra to the west.

The project is approximately 1.12 acres and is located at 235 South Arroyo Drive in the City of San Gabriel (Assessor's Parcel Numbers [APNs] 5346-011-001, -011-004, and -011-006); refer to Exhibit 2, *Site Vicinity*. A limited portion of the project site is located in the City of Alhambra at APNs 5346-008-031, -009-008, and -009-010. Regional access to the project site is provided via the San Bernardino Freeway (Interstate 10) or the Foothill Freeway (Interstate 210). Local access to the project site is provided by Arroyo Drive.

5 Hutton Centre Drive, Suite 500 | Santa Ana, CA 92707
Office: 949.472.3505 | Fax: 949.472.8373

EXISTING CONDITIONS

The northern portion of the project site is currently developed with an existing two-story single-family residential building totaling approximately 2,895 square feet. The Los Angeles County Flood Control District-owned Alhambra Wash traverses the project site in a northeast to southeast direction. The remainder of the project site is vacant land. On-site site topography varies and slopes to the southeast and southwest toward the wash. The project site is surrounded by the following land uses:

- North: Residential uses are situated to the north of the project site.
- East: The Alhambra Wash bounds the project site to the east with South Arroyo Drive and residential uses located east of the Alhambra Wash.
- South: Areas to the south of the project site include vacant land associated with the Alhambra Wash and residential uses.
- West: Areas to the west of the project site are located within the City of Alhambra's jurisdiction and include residential uses.

On-Site Structures

Many older buildings contain building materials that can be hazardous to people and the environment once disturbed. These materials include lead-based paints (LBP) and asbestos-containing materials (ACMs). In the last 25 years, LBP has been phased out of use due to concerns over the health effects associated with lead. Additionally, prior to the 1940s and up until the early 1970s, ACMs were used in many building materials and can result in serious health problems if inhaled. The existing single-family residential building as constructed in 1947.[1] Thus, LBP and ACMs may be present.

EXISTING REGULATORY DATABASE INFORMATION

Geotracker

Michael Baker searched the online GeoTracker database maintained by SWRCB for file information relative to the project site and adjoining properties of concern in May 2019. GeoTracker was developed pursuant to a mandate by the California State Legislature to investigate the feasibility of establishing a statewide Geographic Information System (GIS) for leaking underground storage tanks (LUST) sites and is maintained by the SWRCB. Michael Baker makes no claims as to the completeness or accuracy of GeoTracker; our review of GeoTracker's findings can only be as current as their listings and may not represent all known or potential hazardous waste or contaminated sites.

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[1] First American Real Estate Solutions, *RealQuest Property Data*, accessed on May 15, 2019.

GeoTracker did not report any regulatory properties within the boundaries of the project site or adjoining the project site.[2] No known corrective action, restoration, or remediation has been planned, is currently taking place, or has been completed on the project site pursuant to the SWRCB. The project site has not been under investigation for violation of any environmental laws, regulations, or standards for the SWRCB, as identified in the GeoTracker database.

EnviroStor

Michael Baker searched the EnviroStor database for file information relative to the project site and adjoining properties of concern in May 2019. EnviroStor is an online search and GIS tool maintained by the DTSC that identifies sites with known contamination or sites for which there may be reasons to investigate further. It also identifies facilities that are authorized to treat, store, dispose of, and/or transfer hazardous waste. EnviroStor includes lists of the following site types: Federal Superfund sites (National Priority List); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides site name, site type, status, address, any restricted use (recorded deed restrictions), past use(s) that caused contamination, potential contaminants of concern, potential environmental media affected, site history, and planned and completed activities. Michael Baker makes no claims as to the completeness or accuracy of EnviroStor; our review of EnviroStor's findings can only be as current as its listings and may not represent all known or potential hazardous waste or contaminated sites.

EnviroStor did not report any regulatory properties within the boundaries of the project site or adjoining the project site.[3] No known corrective action, restoration, or remediation has been planned, is currently taking place, or has been completed on the project site. The project site has not been under investigation for violation of any environmental laws, regulations, or standards, as identified in the EnviroStor database.

However, EnviroStor identified one Superfund Site in the vicinity of the project site. The following Superfund Site is of concern:

San Gabriel Valley Superfund Site (Area 3)

In 1984, the discovery of widespread groundwater contamination prompted the U.S. Environmental Protection Agency (EPA) to add four areas in the San Gabriel Valley (Areas 1 through 4) to the National Priorities List (NPL) of the hazardous waste sites that are eligible for cleanup under the Superfund process. The four San Gabriel Valley Superfund sites include areas of groundwater contamination underlying approximately 30 square miles of the 170-square-mile Valley. Regional groundwater contamination is a result of decades of improper handling and disposal practices that released industrial solvents called volatile organic compounds (VOCs) into the soil and groundwater. VOCs are commonly used in dry cleaning, paint stripping, metal plating, and machinery degreasing.

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[2] California State Water Resources Control Board, *GeoTracker*, https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=235+South+Arroyo+Drive+san+gabriel, accessed May 15, 2019.

[3] California Department of , EnviroStor, https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=235+South+Arroyo+Drive+san+gabriel, accessed May 15, 2019.

The project site is situated in the vicinity of Area 3. EPA has collected data in Area 3 continually since 1999. Area 3 consists of a large area (19 square miles) of contaminated groundwater that contains many potential contaminant sources. Based on the *San Gabriel Valley Area 3 Superfund Site Ground Water Monitoring Summary Report 2008-2012*, eight groundwater monitoring wells were installed and sampled annually. Groundwater analytical results detected tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2,3-trichloropropane (1,2,3-TCP), carbon tetrachloride, and perchlorate, which exceeded the EPA's Maximum Contaminant Levels. The EPA is currently characterizing the extent of groundwater contamination at the site and will use these findings to identify and evaluate groundwater cleanup options. The EPA expects complete identification and characterization of the contaminated groundwater in 2019.[4]

Cortese

Government Code Section 65962.5 (also known as the "Cortese List") requires DTSC and SWRCB to compile and update the regulatory sites listing. Additionally, the State Department of Health Services is also required to compile and update, as appropriate, a list of all public drinking water wells that contain detectable levels of organic contaminants and are subject to water analysis pursuant to Health and Safety Code Section 116395. Government Code Section 65962.5 requires the local enforcement agency, as designated pursuant to California Code of Regulations (CCR) Tile 14 Section 18051 to compile, as appropriate, a list of all solid waste disposal facilities from which there is a known migration of hazardous waste. Based on the CalEPA's *Cortese List Data Resources*, the site is not reported on a list maintained pursuant to Government Code Section 65962.5.[5]

PROJECT DESCRIPTION

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage; refer to Exhibit 3, *Conceptual Site Plan*. In addition, a vehicular bridge with a pedestrian walkway would be installed at the southern portion of the project site (over the Alhambra Wash) to provide project access at South Arroyo Drive; refer to Exhibit 4, *Conceptual Bridge Plan*.

CEQA THRESHOLDS OF SIGNIFICANCE

Appendix G, *Environmental Checklist Form*, of the *CEQA Statutes and Guidelines* contains analysis guidelines related to the assessment of hazardous materials. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project may create a significant environmental impact if one or more of the following occurs:

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

[4] U.S. Environmental Protection Agency, San Gabriel Valley (Area 3), Cleanup Activities, https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0902093, accessed June 4, 2019.

[5] California Environmental Protection Agency, *Cortese List Data Resources*, http://www.calepa.ca.gov/sitecleanup/corteselist/, accessed May 15, 2019.

We Make a Difference

- Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing school or proposed school; and
- 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.

IMPACT ANALYSIS

The following findings, opinions, and conclusions are based upon review of reasonably ascertainable referenced material available to Michael Baker during the preparation of this Memorandum, which included a review of available online public records (GeoTracker maintained by SWRCB and EnviroStor maintained DTSC), as well as the State Cortese Database Listing, maintained by CalEPA (refer to Table 1, *CEQA Appendix G Hazardous Materials Checklist*):

Table 1
CEQA Appendix G Hazardous Materials Checklist

Would the project:	**Potentially Significant Impact**	**Less Than Significant Impact With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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?				✓

We Make a Difference

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*.** Exposure of the public or the environment to hazardous materials could occur through improper handling or use of hazardous materials or hazardous wastes particularly by untrained personnel, a transportation accident, environmentally unsound disposal methods, or fire, explosion, or other emergencies. The severity of potential effects varies with the activity conducted, the concentration and type of hazardous material or wastes present, and the proximity of sensitive receptors.

Construction

Project construction could expose construction workers and the public to temporary hazards related to the transport, use, and maintenance of construction materials (i.e., oil, diesel fuel, transmission fluid, etc.). These activities would be short-term, and the materials used would not be in such quantities or stored in such a manner as to pose a significant safety hazard. All project construction activities would demonstrate compliance with the applicable laws and regulations governing the use, storage, and transportation of hazardous materials, ensuring that all potentially hazardous materials are used and handled in an appropriate manner. Impacts concerning the routine transport, use, or disposal of hazardous materials during project construction would be less than significant.

Operations

Substantial risks associated with hazardous materials are not typically associated with residential uses. Minor cleaning products along with the occasional use of pesticides and herbicides for landscape maintenance of the project site are generally the extent of hazardous materials that would be routinely utilized on-site. Thus, as the presence and on-site storage of these materials are common for residential uses and would not be stored in substantial quantities (quantities required to be reported to a regulatory agency), impacts in this regard are less than significant.

Mitigation Measures: 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.

Construction

One of the means through which human exposure to hazardous substance could occur is through accidental release. Incidents that result in an accidental release of hazardous substances into the environment can cause contamination of soil, surface water, and groundwater, in addition to any toxic fumes that might be generated. Human exposure of contaminated soil or water can have potential health effects based on a variety of factors, such as the nature of the contaminant and the degree of exposure. Construction activities associated with the proposed project could release hazardous materials into the environment through reasonably foreseeable upset and accident conditions. Construction activities could expose construction workers to accidental conditions as a result of existing potential hazardous substances in on-site structures and groundwater. The following analysis considers potential disturbance of hazardous materials on-site during demolition/construction.

On-Site Structures

Construction activities would include demolition of the existing single-family residential building. This on-site structure may be associated with hazardous materials (e.g., ACMs and/or LBP), as it was constructed in 1947.[6] Demolition of the structure could expose construction personnel and the public to ACMs or LBPs. Federal and State regulations govern the renovation and demolition of structures where ACMs and LBPs are present. Asbestos removal would be performed in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1403. Lead-based paint removal and disposal would be performed in accordance with CCR Title 8, Section 1532.1. Compliance with Federal and State regulations, including SCAQMD Rule 1403 and CCR Title 8, Section 1532.1, would reduce potential impacts in this regard to less than significant levels.

Regional Contaminated Groundwater

The project site is located in the vicinity of the San Gabriel Valley Superfund Site (Area 3). As a result of the superfund action investigation, eight groundwater monitoring wells were installed and sampled annually. Groundwater analytical results detected PCE, TCE, 1,2,3-TCP, carbon tetrachloride, and perchlorate which exceeded the EPA's Maximum Contaminant Levels. Based on the Los Angeles Public Works Groundwater Wells Database, depth to groundwater in the site vicinity ranges from approximately 245 to 281 feet below ground surface (bgs).[7] The proposed underground parking garage would excavate to a depth of approximately 24 feet bgs. Therefore, groundwater is not anticipated to be encountered and impacts in this regard would be less than significant.

Operations

Refer to Response (a) for a description of impacts related to project operations. Impacts in this regard would be less than significant.

Mitigation Measures: 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?

Less Than Significant Impact. Three existing schools are situated within 0.25-mile of the project site (Paramount Academy located 0.12-mile northwest, Granada Elementary School located 0.14-

[6] First American Real Estate Solutions, *RealQuest Property Data*, accessed on May 15, 2019.
[7] Los Angeles County Public Works, *Groundwater Wells*, Well ID: 2880C and 2890, https://dpw.lacounty.gov/general/wells/, accessed June 4, 2019.

mile southwest, and Growing Time Montessori School located 0.17-mile east of the site). The project is anticipated to involve the demolition of the existing single-family residential building, which may require the handling of hazardous (ACMs and LBPs) materials at the site as well as the transport of these materials off-site to an approved landfill facility. These activities would be required to comply with Federal, State, and local laws and regulations regarding the handling and transport of hazardous materials. With compliance with Federal, State, and local laws and regulations, the project would result in less than significant impacts involving the handling of hazardous materials, substances, or waste within the vicinity of these schools.

Mitigation Measures: 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. The project site is not listed pursuant to Government Code Section 65962.5.[8] Thus, no impact would result in this regard.

Mitigation Measures: No mitigation measures are required.

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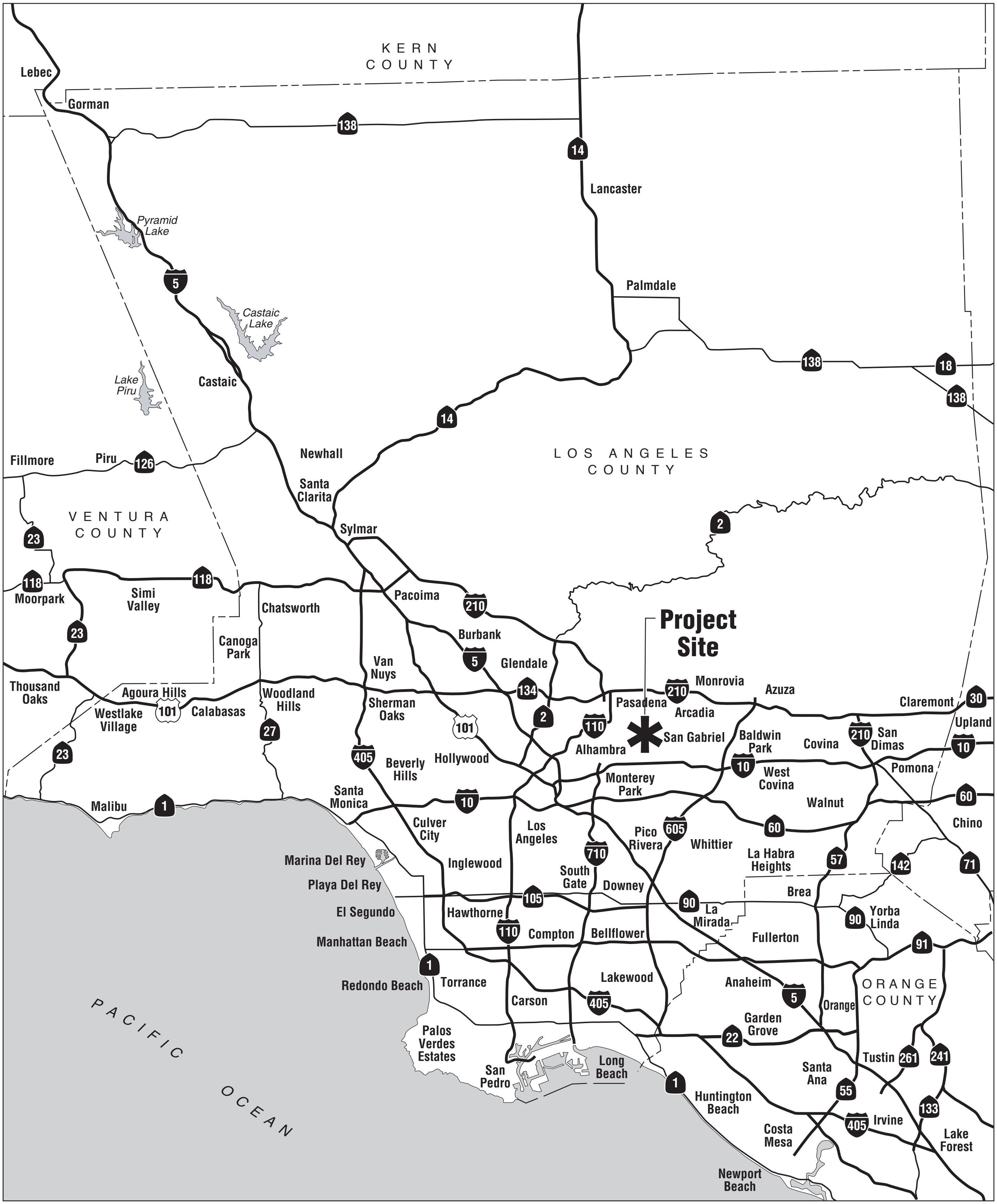
[8] California Environmental Protection Agency, *Cortese List Data Resources*, http://www.calepa.ca.gov/sitecleanup/corteselist/, accessed May 15, 2019.

EXHIBITS



CEQA HAZARDS AND HAZARDOUS MATERIALS MEMORANDUM
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

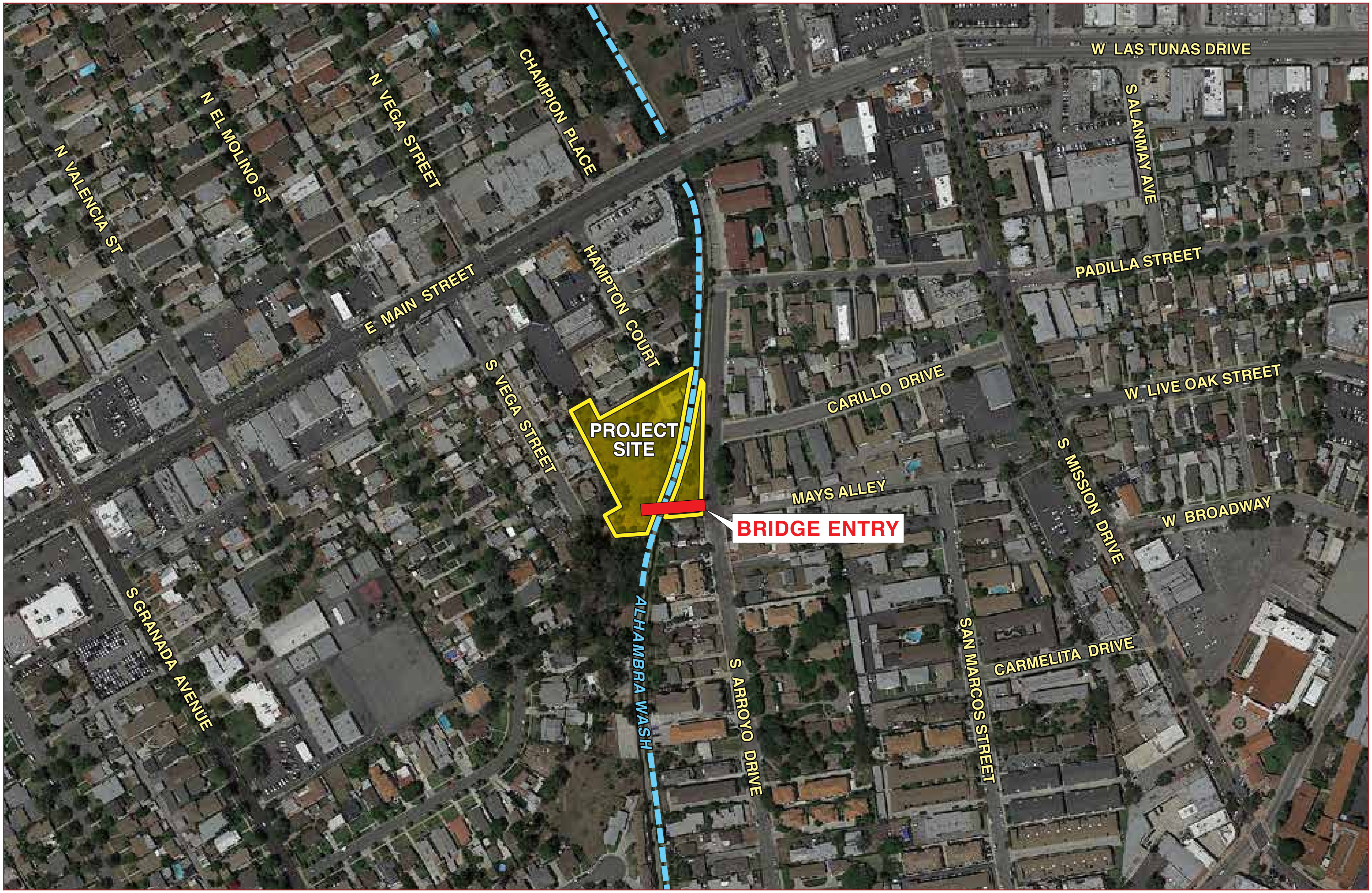
Regional Vicinity

Exhibit 1

0 5 10 miles
APPROXIMATE

Michael Baker INTERNATIONAL

06/19 I JN 172409



Source: Google Earth, April 2019.

CEQA HAZARDS AND HAZARDOUS MATERIALS MEMORANDUM
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

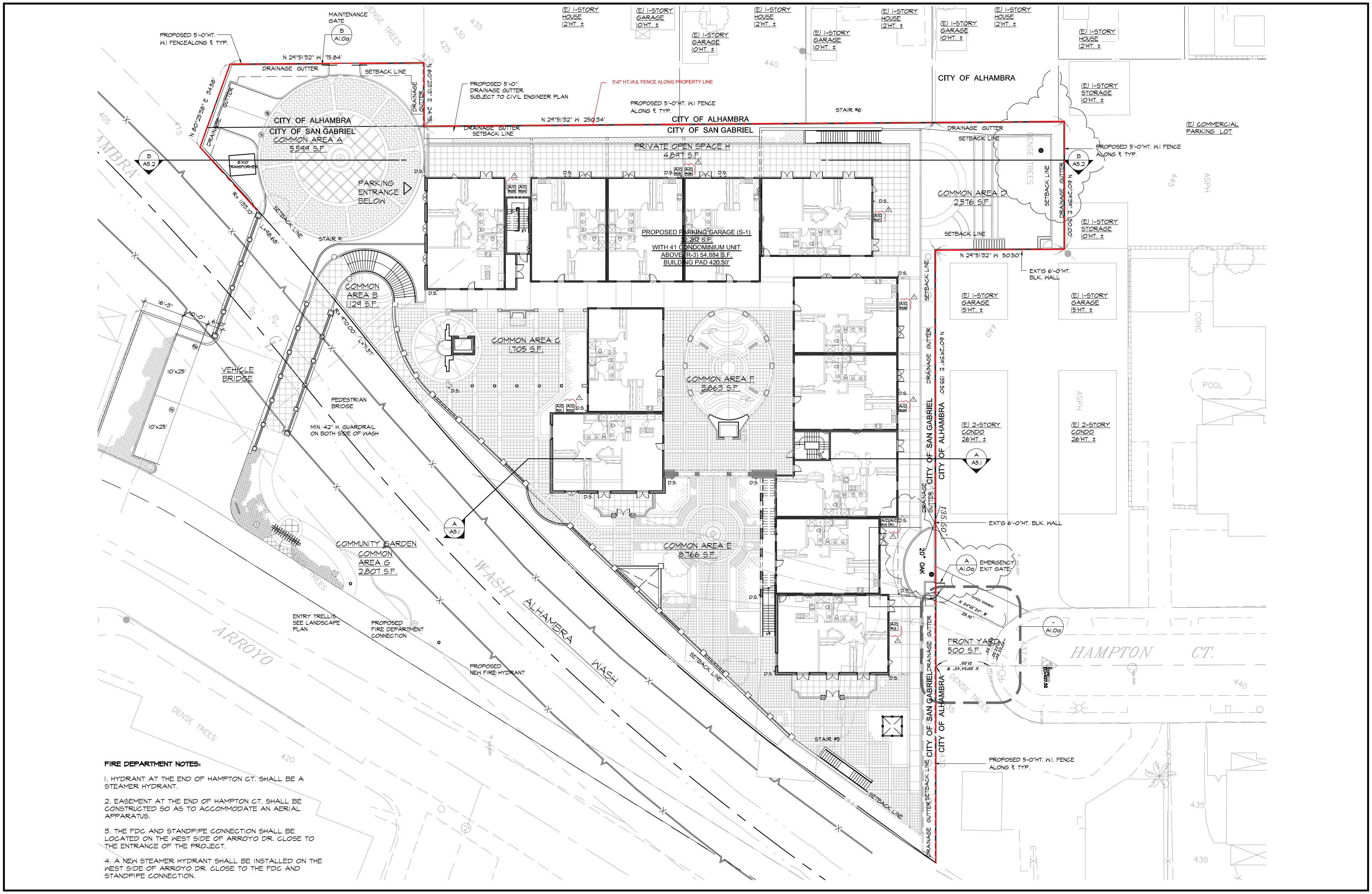
Michael Baker INTERNATIONAL

NOT TO SCALE

06/19 I JN 172409

Site Vicinity

Exhibit 2



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

CEQA HAZARDS AND HAZARDOUS MATERIALS MEMORANDUM
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

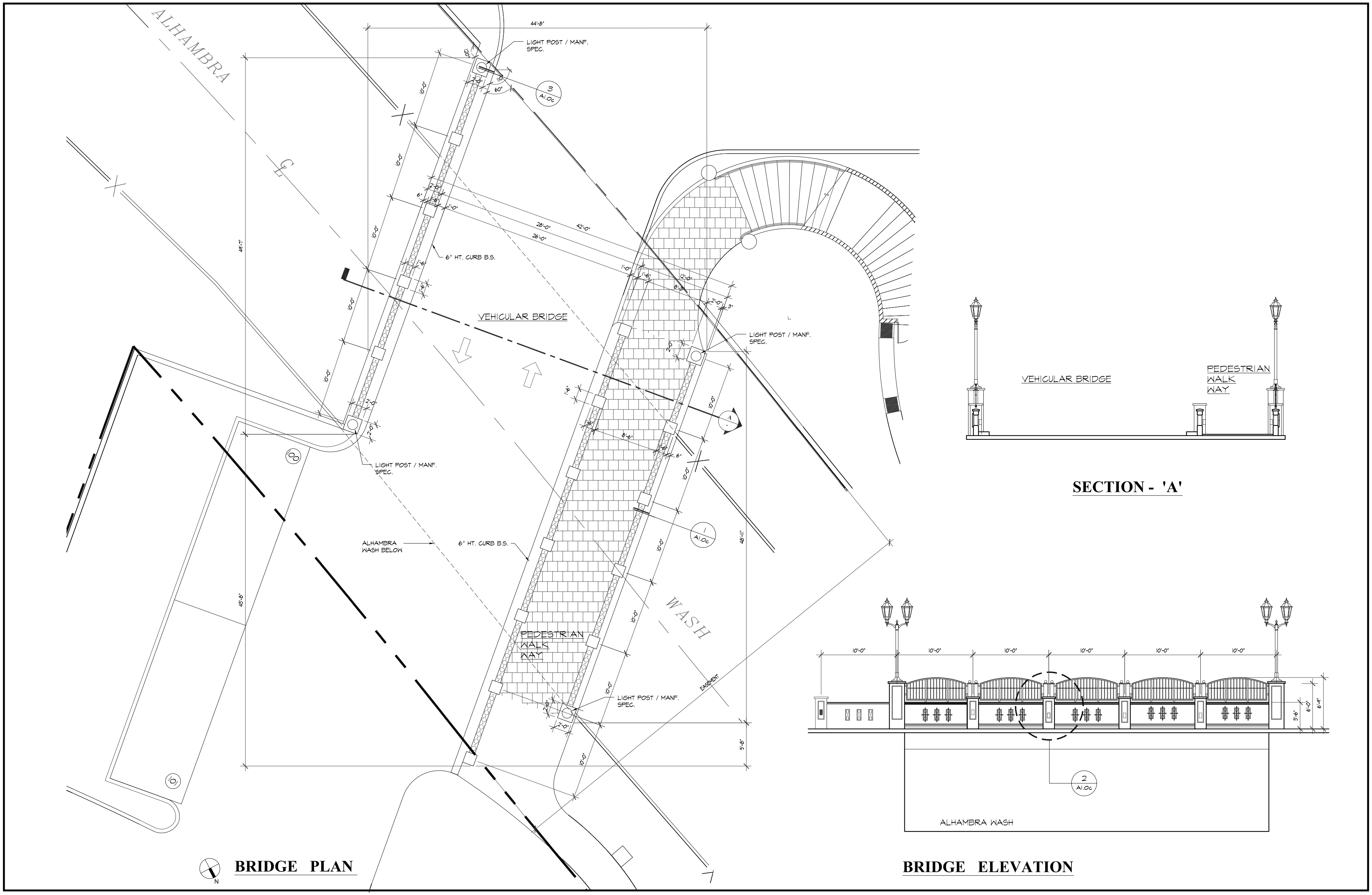
Conceptual Site Plan

NOT TO SCALE

06/19 | JN 172409

Michael Baker INTERNATIONAL

Exhibit 3



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0b, Bridge Plan, August 13, 2013.

NOT TO SCALE

Michael Baker INTERNATIONAL

CEQA HAZARDS AND HAZARDOUS MATERIALS MEMORANDUM
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Bridge Plan

06/19 I JN 172409

Exhibit 4

APPENDIX G
Hydrology Study

PRELIMINARY
HYDROLOGY STUDY, DRAINAGE STUDY AND LOW IMPACT DEVELOPMENT CALCULATION

FOR TENTATIVE TRACT NO. 61475

235 S. ARROYO DR.
SAN GABRIEL, CA 91776

07/17/2017

REGISTERED PROFESSIONAL ENGINEER
GUAN WANG
No. 79702
Exp. 9-30-18
CIVIL
STATE OF CALIFORNIA

TRITECH ENGINEERING ASSOCIATES

SUBDIVISION
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JOB. NO. 140714

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1. Purpose

The purpose of this report is the study of the hydrology impact from project development. The-50-year runoff and LID runoff will be determined by the Los Angeles County HydroCalc Program

2. Description

A. Existing Site:

This project is located on the west of S.Arroyo Dr between Padilla St and Carrillo Dr in city of San Gabriel, county of Los Angeles, State of California. The project is devided 2 parts by Alhambra Wash. The site area is about 1.308 Acres (included dedication area)

For the area at the west of Alhambra Wash, 51,250 SF, the lot coverage contains one 2,895 SF-house and 1,297-SF asphalt driveway (Approximately). The rest of the lot area are landscape and undeveloped area. The imperviousness is about 8%. The drainage pattern flows from West to East and drain into Alhambra Wash by gravity. The average site slope is about 9%

For the area at the east of Alhambra Wash, 5,689 SF, the lot coverage contains 2,288 SF-Impervious surface. The imperviousness is around 40%. The drainage pattern flows from East to West and drain into Alhambra Wash by gravity. The average slope is about 1 %.

The runoff from west- and northwest-adjacent properties flow through project site and drain into Alhambra Wash.

B. Proposed Site:

This project is a redevelopment project. This development is a 41-unit condominium building (57,332 SF living area) located on the west of Alhambra Wash. The entrance of project is on the east of Alhambra Wash at S Arroyo Dr. The proposed bridge will be constructed for both side connection.

The land-disturbing activity that results in the creation of 10,000 square feet or more of impervious surface area on a site that was previously developed as a single family house then this project is a designated project. Therefore this project must retain 100% of SWQDv on site.

The disturbed area is approximately 55,982 SF included bridge and encroachment area(3,200 SF). The dedication area and undisturbed area are 2,775 SF. The building and hardscape area(driveway, parking area, bridge area and walkway area) are 53,817 SF. The landscape area is 2,690 SF. The gutter area along property line for drainage bypassing is around 3,550 SF. The imperviousness after development for all areas is about 95% (Excluded dedication area, bypassing gutter area and undisturbed area)

The proposed drainage pattern will be separated 2 main areas; Building area (the area on west side of Alhambra Wash) and Entrance area. All areas are divided in 39 sub-area (See Hydrology Map sheet 2 for details).

The runoff from building and surrounding area (walkway, driveway, deck area, etc.) will be collected by area drains and catch basins. The grate inlet skimmer boxes and downspout filter will be installed in all catch basins and all downspouts for Pre-Treatment (use curb inlet basket system for open-curb catch basin). The runoff after filtered will directly drain into infiltration trench located at driveway area (See hydrology Map or LID EXHIBIT MAP for location, size, and details). The overflow from infiltration trench will directly discharge to Alhambra Wash by gravity.

The runoff from bridge and entrance area will be collected by trench drain and catch basins. The grate inlet skimmer boxes and filter inserted trench drain will be installed for Pre-Treatment. The runoff after pre-treatment will directly drain into infiltration trench located at entrance area(See hydrology Map or LID EXHIBIT MAP for location, size, and details). The overflow from infiltration will directly discharge to Alhambra Wash by gravity.

Since runoff from this project discharge to Alhambra Wash (32' wide rectangular concrete channel), the increasing runoff from this project is not adversely impact to Alhambra Wash. Therefore this project is exempted from Hydromodification Requirement.

The runoff from adjacent property will be collected by gutter along north and west property line. All runoff will directly discharge to Alhambra Wash by gravity. The concrete block wall next to gutter will be omitted every 15' at gutter edge elevation for emergency outlet.

For LID Purposes, the pervious concrete will be used for gutter along the property line.

For the Stormwater quality control measure, The Infiltration Trench (RET-3) will be used for retain total 100% of SWQDv

The source control measures to be implemented will be:

- Storm Drain Massage and Signage (S-1)
- Landscape Irrigation Practices (S-8)
- Building Materials (S-9)

The owner have to operate and maintain all BMPs devices per the proposed maintenance plan attached at the end of this report.

3. Methodology

All the Hydrology Analysis included LID runoff and volume are according to the Los Angeles County Hydrology Manual. The Hydrocalc Program will be used for runoff and volume calculation in this study.

From http://www.dpw.lacounty.gov/wrd/hydrologygis, the final 85th Percentile, 24-hr Rainfall Isohyet is 1.12" that is more than 0.75" isohyet. Therefore this study will be used 1.12" for determine the runoff and volume for BMPs Design.

Base on soil report by CALLAND Engineering, INC., Date June 28, 2016, The design infiltration rate = 1.28"/hr is recommended for infiltration system design.

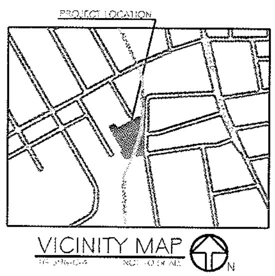
4. VICINITY MAP

HYDROLOGY MAP

PRE-DEVELOPMENT

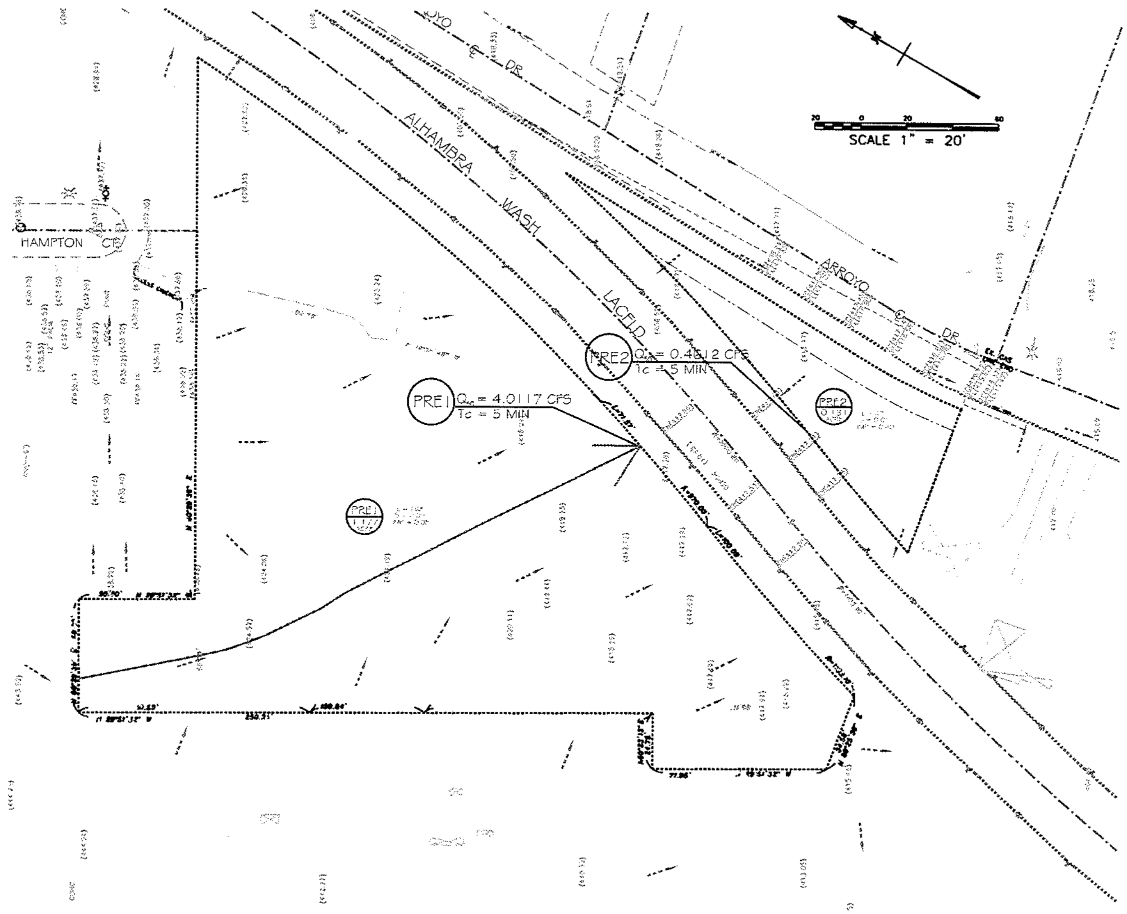
HYDROLOGY MAP

FOR TENTATIVE TRACT NO. 61475
PRE-DEVELOPMENT



SOIL CLASSIFICATION: 014
50 YEAR 24-HOUR ISOHYET: 6.95"
FINAL 85TH PERCENTILE, 24-HR RAINFALL: 1.12"

PRE-DEVELOPMENT	PRE 1	PRE 2
AREA (AC.)	1.177	0.131
IMP %	0.08	0.40
LENGTH (FT.)	268'	47
SLOPE	0.09	0.01
Tc (min)	5	5
Q_{50} FLOWRATE (CFS)	4.0117	0.4612
TOTAL Q_{50}	4.4729	



LEGAL DESCRIPTION:

BENCH MARK OF CITY OF ALHAMBRA

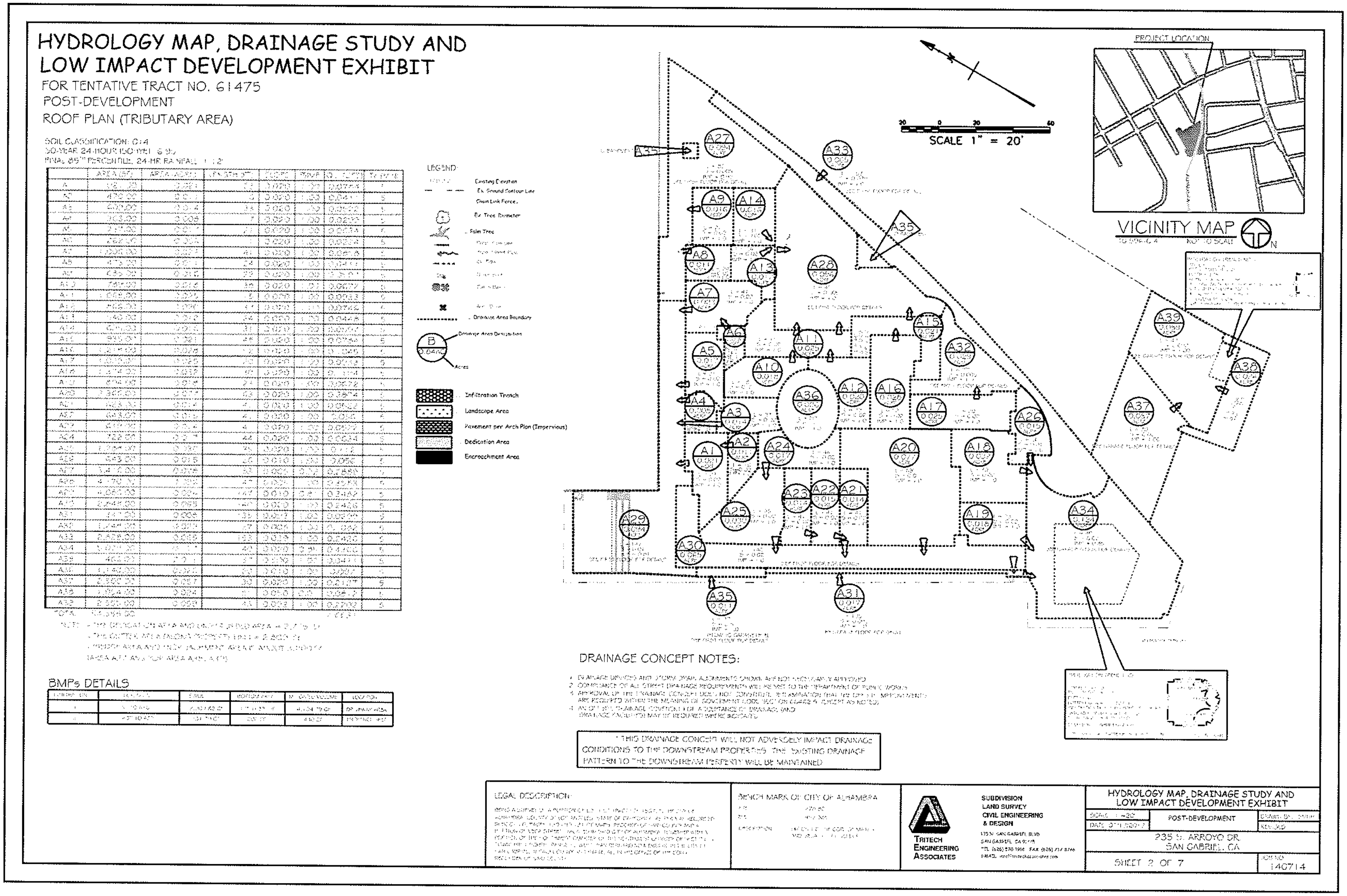
TRITECH ENGINEERING ASSOCIATES
SUBDIVISION
LAND SURVEY
CIVIL ENGINEERING
& DESIGN

HYDROLOGY MAP
PRE-DEVELOPMENT
235 S. ARROYO DR.
SAN GABRIEL, CA
SHEET 1 OF 7
140714

NOT TO SCALE
SEE ATTACHED HYDROLOGY MAP FOR DETAILS

HYDROLOGY MAP

POST-DEVELOPMENT



NOT TO SCALE
SEE ATTACHED HYDROLOGY MAP FOR DETAILS

5. HYDROLOGY ANALYSIS

FROM L.A. HYDROLOGY MANUAL FIG. H1.20
(SEE ATTACH SHEETS)
SOIL CLASSIFICATION: 014
50 YEAR 24 HOUR ISOHYET = 6.95"
FINAL 85TH PERCENTILE, 24HR RAINFALL = 1.12"

PRE-DEVELOPMENT

	AREA (SF)	AREA (ACRE)	LENGTH (FT)	SLOPE	%IMP
PRE 1	51,250.00	1.177	268	0.090	0.08
PRE 2	5,689.00	0.131	47	0.010	0.40
TOTAL	56,939.00				

POST-DEVELOPMENT

	AREA (SF)	AREA (ACRE)	LENGTH (FT)	SLOPE	%IMP
A1	921.00	0.021	23	0.020	1.00
A2	470.00	0.011	16	0.020	1.00
A3	609.00	0.014	33	0.020	1.00
A4	363.00	0.008	17	0.020	1.00
A5	737.00	0.017	21	0.020	1.00
A6	262.00	0.006	11	0.020	1.00
A7	1,006.00	0.023	41	0.020	1.00
A8	473.00	0.011	24	0.020	1.00
A9	685.00	0.016	22	0.020	1.00
A10	789.00	0.018	38	0.020	1.00
A11	1,068.00	0.025	15	0.020	1.00
A12	866.00	0.020	39	0.020	1.00
A13	540.00	0.012	24	0.020	1.00
A14	695.00	0.016	31	0.020	1.00
A15	935.00	0.021	48	0.020	1.00
A16	1,218.00	0.028	52	0.020	1.00
A17	1,099.00	0.025	20	0.020	1.00
A18	1,374.00	0.032	30	0.020	1.00
A19	804.00	0.018	23	0.020	1.00
A20	3,366.00	0.077	63	0.020	1.00
A21	623.00	0.014	41	0.020	1.00
A22	643.00	0.015	41	0.020	1.00
A23	619.00	0.014	41	0.020	1.00
A24	722.00	0.017	44	0.020	1.00
A25	1,288.00	0.030	35	0.020	1.00
A26	643.00	0.015	26	0.010	1.00
A27	3,416.00	0.078	83	0.005	0.92
A28	4,170.00	0.096	47	0.005	1.00
A29	4,086.00	0.094	147	0.010	0.81
A30	2,848.00	0.065	140	0.020	1.00
A31	347.00	0.008	135	0.093	1.00
A32	1,248.00	0.029	27	0.005	1.00
A33	2,828.00	0.065	153	0.039	1.00
A34	5,079.00	0.117	40	0.020	0.85
A35	466.00	0.011	37	0.500	1.00
A36	1,140.00	0.026	20	0.010	1.00
A37	2,500.00	0.057	30	0.020	1.00
A38	1,054.00	0.024	51	0.050	0.01
A39	2,555.00	0.059	43	0.092	1.00
TOTAL	54,555.00				

NOTE: - THE DEDICATION AREA AND UNDISTURBED AREA = 2,775 SF
- THE GUTTER AREA (ALONG PROPERTY LINE) = 2,809 SF
- BRIDGE AREA AND ENCROACHMENT AREA IS ABOUT 3,200 SF
(AREA A37 AND POR.AREA A38, A39)

USE HydroCalc Calculator
50 YEAR-RETURN PERIOD
(SEE ATTACHED SHEETS FOR DETAILS)

PRE-DEVELOPMENT

	Q (CFS)	VOLUME (CU-FT)	Tc (MIN)
A	4.0117	6,478.93	5
B	0.4612	1,496.32	5
TOTAL	4.4729	7,975.25	

POST-DEVELOPMENT

	Q (CFS)	VOLUME (CU-FT)	Tc (MIN)
A1	0.0784	472.88	5
A2	0.0411	247.70	5
A3	0.0522	315.25	5
A4	0.0299	180.14	5
A5	0.0634	382.81	5
A6	0.0224	135.11	5
A7	0.0858	517.91	5
A8	0.0411	247.70	5
A9	0.0597	360.29	5
A10	0.0672	405.32	5
A11	0.0933	562.95	5
A12	0.0746	450.36	5
A13	0.0448	270.22	5
A14	0.0597	360.29	5
A15	0.0784	472.88	5
A16	0.1045	630.50	5
A17	0.0933	562.95	5
A18	0.1194	720.58	5
A19	0.0672	405.32	5
A20	0.2874	1,733.89	5
A21	0.0522	315.25	5
A22	0.056	337.77	5
A23	0.0522	315.25	5
A24	0.0634	382.81	5
A25	0.112	675.54	5
A26	0.056	337.77	5
A27	0.2889	1,641.01	5
A28	0.3583	2,161.73	5
A29	0.3482	1,805.42	5
A30	0.2426	1,463.67	5
A31	0.0299	180.14	5
A32	0.1082	653.02	5
A33	0.2426	1,463.67	5
A34	0.4366	2,634.61	5
A35	0.0411	247.70	5
A36	0.097	585.47	5
A37	0.2127	1,283.53	5
A38	0.0812	101.04	5
A39	0.2202	1,328.56	5
TOTAL	4.6631	27,349.01	

USE HydroCalc Calculator
LID ANALYSIS
(SEE ATTACHED SHEETS FOR DETAILS)

POST-DEVELOPMENT

	Q (CFS)	VOLUME (CU-FT)	Tc (MIN)
A1	0.0126	76.20	5
A2	0.0066	39.91	5
A3	0.0084	50.80	5
A4	0.0048	29.03	5
A5	0.0102	61.69	5
A6	0.0036	21.77	5
A7	0.0138	83.46	5
A8	0.0066	39.91	5
A9	0.0096	58.06	5
A10	0.0108	65.32	5
A11	0.015	90.72	5
A12	0.012	72.58	5
A13	0.0072	43.55	5
A14	0.0096	58.06	5
A15	0.0126	76.20	5
A16	0.0168	101.61	5
A17	0.015	90.72	5
A18	0.0192	116.12	5
A19	0.0108	65.32	5
A20	0.0463	279.42	5
A21	0.0084	50.80	5
A22	0.009	54.43	5
A23	0.0084	50.80	5
A24	0.0102	61.69	5
A25	0.018	108.86	5
A26	0.009	54.43	5
A27	0.0349	262.92	8
A28	0.0577	348.36	5
A29	0.0328	286.51	11
A30	0.0313	235.87	8
A31	0.0044	29.03	6
A32	0.0174	105.24	5
A33	0.0313	235.87	8
A34	0.0704	424.57	5
A35	0.0066	39.92	5
A36	0.0156	94.35	5
A37	0.0343	206.84	5
A38	0.001	10.45	16
A39	0.0355	214.10	5
TOTAL	0.6877	4,395.49	

6. LOW IMPACT DEVELOPMENT DESIGN

STORMWATER QUALITY CONTROL MEASURE BMPs DESIGN

FOR BUILDING AREA (AREA A1-A36)

INFILTRATION TRENCH DESIGN

THE SWQDv = 3,964.10 CF

INFILTRATION TRENCH FILL POROSITY, n_t = 40%

THE DESIGN INFILTRATION RATE K_{SAT} = 1.28"/HOUR (FROM SOIL REPORT)

THE MAXIMUM RETENTION TIME, T = 96

$$d_{MAX} = \frac{K_{DESIGN}}{12} \times T = 10.24'$$

$$d_t \leqslant \frac{d_{MAX}}{n_t} = 25.60'$$

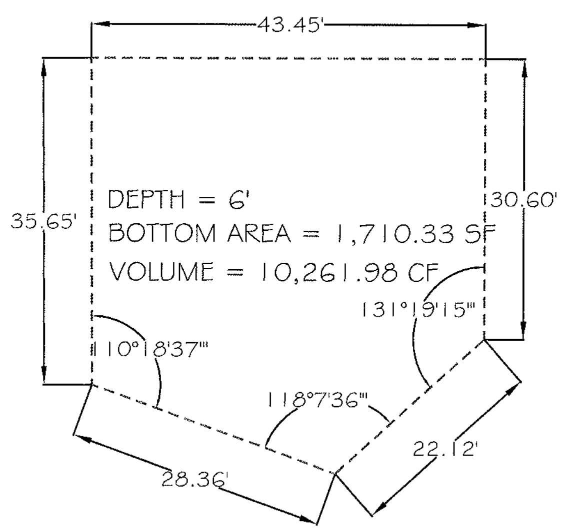
USE DEPTH = 6.0' < 25.60' OK

$$A_{MIN} = \frac{SWQDv}{d_t \times n_t} = \frac{3,964.10}{6.00' \times 0.4} = 1,651.71 \text{ SF}$$

BOTTOM AREA = 1,710.33 SF > 1,651.71 SF OK

REQUIRED VOLUME = 3,964.10 / 0.4 = 9,910.25 CF

VOLUME = 10,261.98 CF > 9,910.25 CF OK



FOR ENTRANCE AND BRIDGE AREA (AREA A37-A39)

INFILTRATION TRENCH DESIGN

THE SWQDv = 431.39 CF

INFILTRATION TRENCH FILL POROSITY, n_t = 40%

THE DESIGN INFILTRATION RATE K_{SAT} = 1.28"/HOUR (FROM SOIL REPORT)

THE MAXIMUM RETENTION TIME, T = 96

$$d_{MAX} = \frac{K_{DESIGN}}{12} \times T = 10.24'$$

$$d_t \leqslant \frac{d_{MAX}}{n_t} = 25.60'$$

USE DEPTH = 5.5' < 25.60' OK

$$A_{MIN} = \frac{SWQDv}{d_t \times n_t} = \frac{431.39}{5.50 \times 0.4} = 196.09 \text{ SF}$$

BOTTOM AREA = 200 SF > 196.09 SF OK

REQUIRED VOLUME = 431.39/ 0.4 = 1,078.48 CF

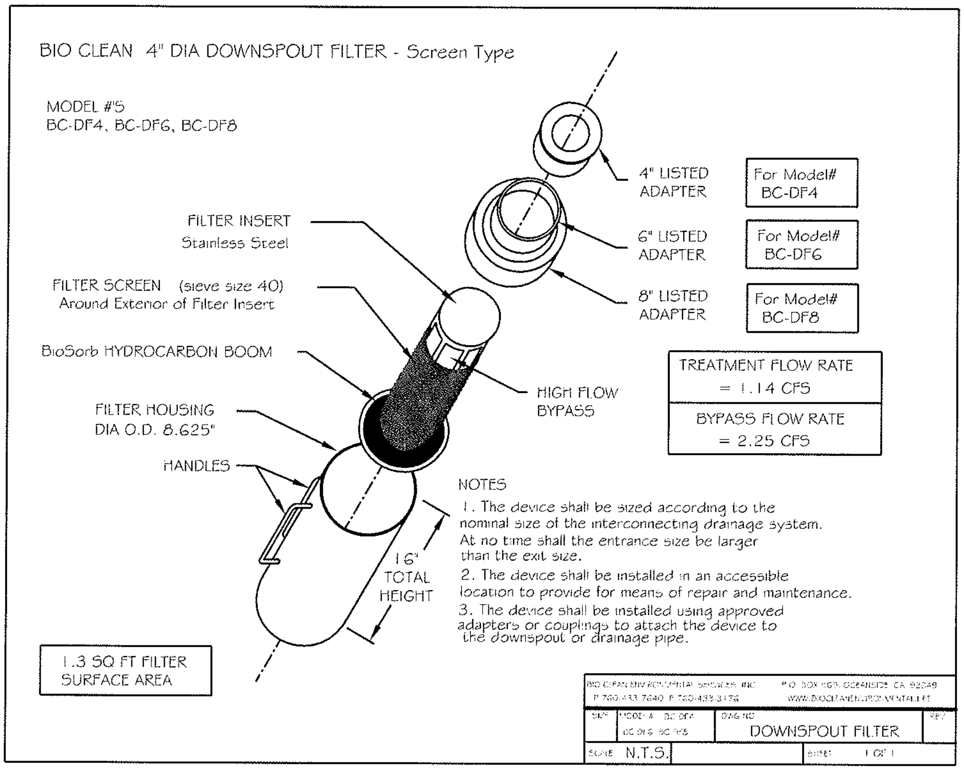
VOLUME = 1,100 CF > 1,078.48 CF OK

DEPTH = 5.50'

BOTTOM AREA = 200 SF

VOLUME = 1,100 CF

DOWNSPOUT FILTER DESIGN



The Maximum Q_{PM} = 0.1316 CFS (FROM DOWNSPOUT IN AREA A30 DRAIN TO GARAGE FLOOR)
(RUNOFF FROM AREA A20+A21+A22+A23+A24+A25+A30)

THE FILTERED FLOW CAPACITY = 1.14 CFS
$> Q_{PM}$ OK

GRATE INLET SKIMMER BOX DESIGN

FROM SPECIFICATION (SEE ATTACHED SHEET)

Flow Specifications				
Description of filter opening	Percent Open (Based on Screen Dimensions)	Total Square Inches per Unit	Square Inches of Total Unobstructed Openings	Flow Rate (Cubic Feet per Second)
Skimmer protected By-Pass	100%	28.0	28.0	1.0 cfs
Coarse Screen 3/4" x 1-3/4" stainless steel flattened expanded	62%	28.0	17.3	.8 cfs
Medium Screen 10x10 mesh stainless steel	56%	28.0	15.8	.7 cfs
Fine screen 14 x 18 mesh stainless steel	68%	16.0	10.8	.6 cfs
THROAT FLOW RATE Total: 0.5cfs		TREATED FLOW RATE Total: 2.1 cfs		
FLOW RATES BASED ON UNOBSTRUCTED OPENINGS				

The Maximum Q_{PM} = 0.0343 CFS (RUNOFF FROM AREA A37)

THE FILTERED FLOW CAPACITY = 2.1 CFS

$> Q_{PM}$ OK

7. OFF-SITE DRAINAGE ANALYSIS

HYDROLOGY ANALYSIS:

FROM http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html

AND http://www.dpw.lacounty.gov/wrd/hydrologygis/

(SEE ATTACH SHEETS)

SOIL CLASSIFICATION: 014

50 YEAR FREQUENCY RAINFALL = 7.0"

DETERMINE THE QUANTITY TO THE END OF HAMPTON COURT CUL-DE-SAC

(THIS RUNOFF WILL BE BYPASSED TO ALHAMBRA WASH)

THE EXISTING CONDITION: AVERAGE STREET SLOPE = 4.14%

A = 124,605 SF = 2.86 ACRES, L = 372', S = 0.0376 (AVERAGE), %IMP = 1

Use Hydrocalc Calculator Program

(SEE ATTACH SHEETS)

Q_{50} = 10.75 CFS Tc = 5 min

CHECK BYPASS PIPE CAPACITY:

USE 12"PVC PIPE WITH MINIMUM 9.2%SLOPE

$$Q = \frac{1.486}{n}(R)^{2/3}(S)^{1/2}A$$

n = 0.009 A = 0.7854 S= 0.092(MIN)

P = 3.1416 R = A/P = 0.25

$$Q = 165.11\,(0.25)^{2/3}(0.092)^{1/2}(0.7854)$$

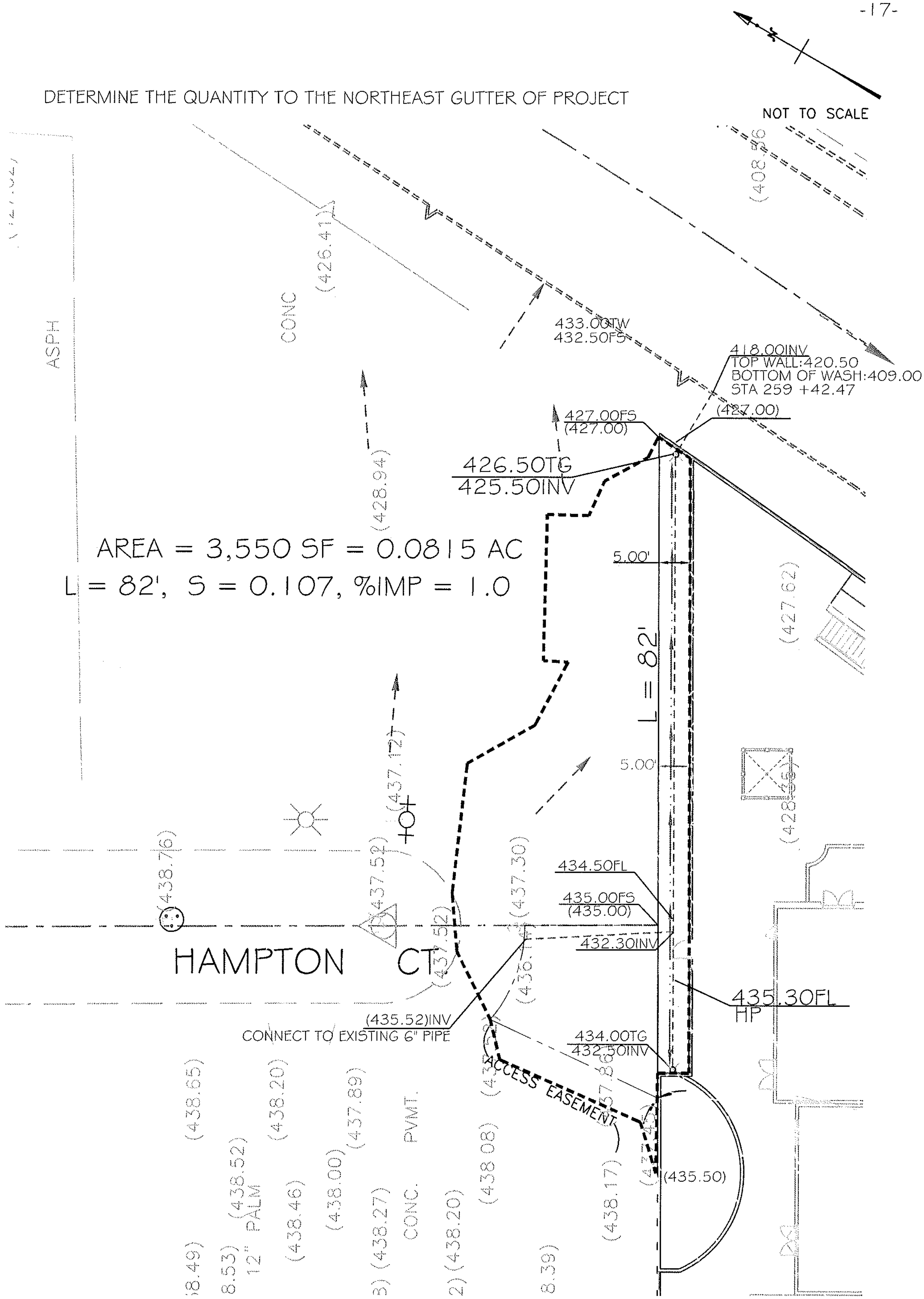
$Q_{CAPACITY}$ = 15.54 CFS > Q_{REQ}

OK

A = 124,605 SF = 2.86 ACRES, L = 372', S = 0.0376 (AVERAGE), %IMP = 1

NOT TO SCALE

DETERMINE THE QUANTITY TO THE NORTHEAST GUTTER OF PROJECT



DETERMINE THE QUANTITY TO THE NORTHEAST GUTTER OF PROJECT

A = 3,550 SF = 0.0815 ACRES, L = 82', S = 0.107, %IMP = 1

Use Hydrocalc Calculator Program

(SEE ATTACH SHEETS)

Q_{50} = 0.3042 CFS Tc = 5 min

CHECK GUTTER CAPACITY:

USE 5'-WIDTH GUTTER WITH MINIMUM 2.0%SLOPE

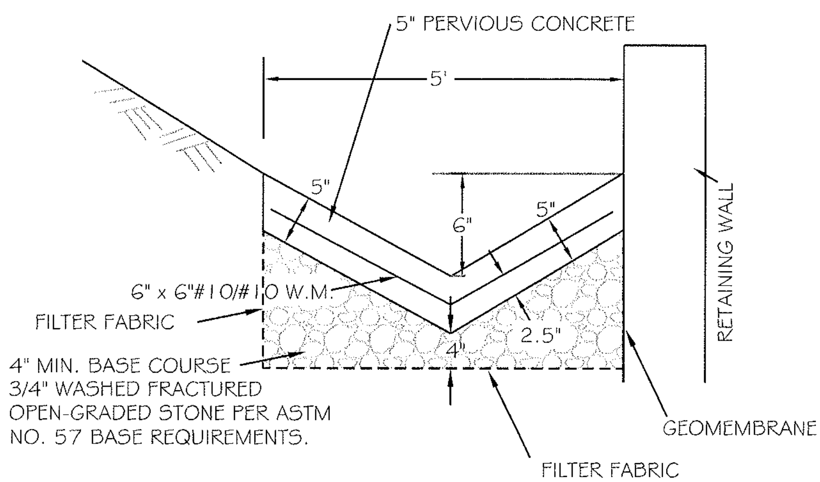
$$Q = \frac{1.486}{n}(R)^{2/3}(S)^{1/2}A$$

n = 0.011 A = 1.25 S= 0.02

P = 5.099 R = A/P = 0.245

$$Q = 135.09\,(0.245)^{2/3}(0.02)^{1/2}(1.25)$$

$Q_{CAPACITY} = 9.307 CFS > Q_{REQ}$ OK



CHECK PIPE CAPACITY TO WASH:

Q_{REQ} = 10.2839 + 0.3042 = 10.5881 CFS

USE 12"PVC PIPE WITH MINIMUM 68%SLOPE

$$Q = \frac{1.486}{n}(R)^{2/3}(S)^{1/2}A$$

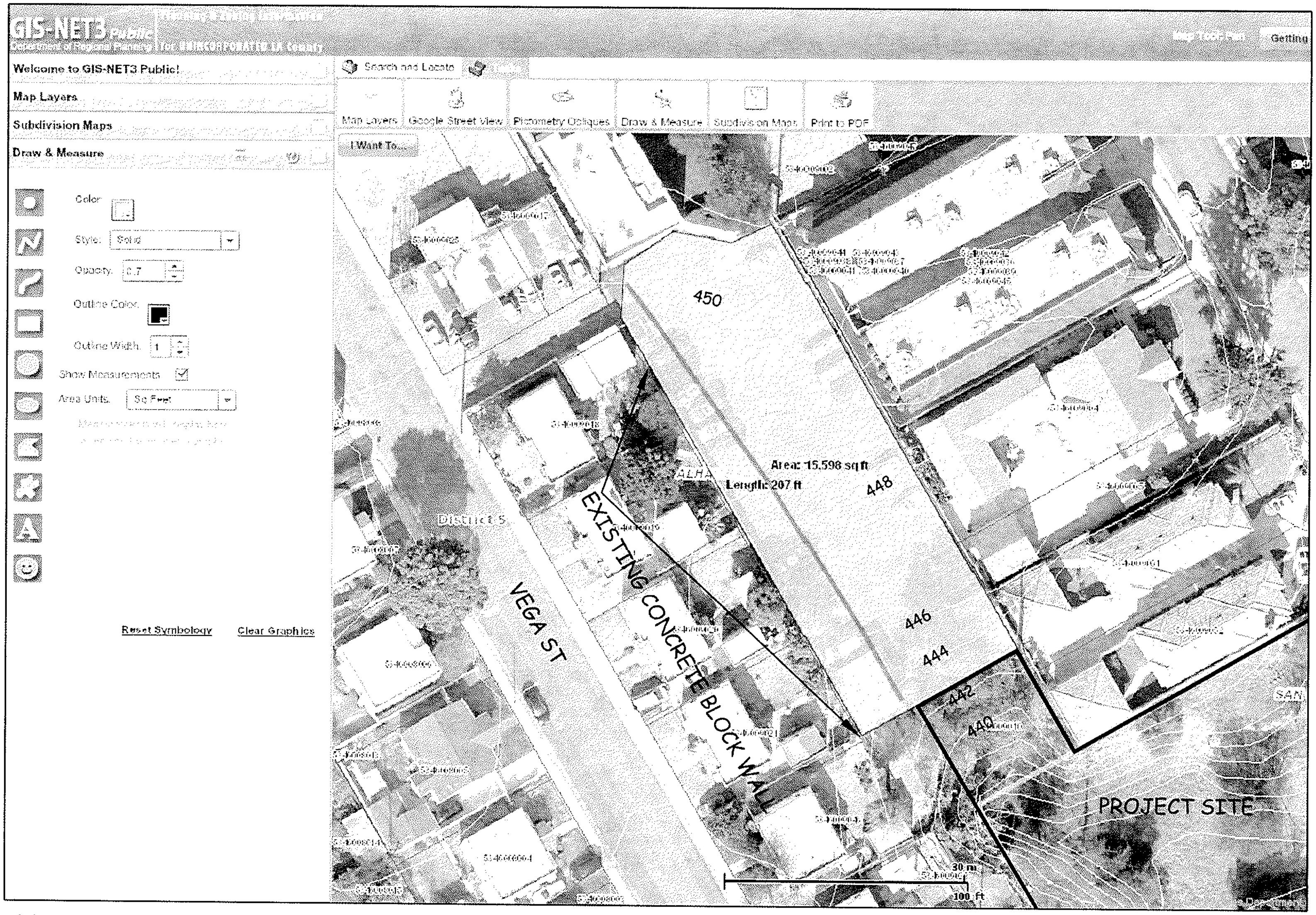
n = 0.009 A = 0.7854 S= 0.68

P = 3.1416 R = A/P = 0.25

$$Q = 165.11\,(0.25)^{2/3}(0.68)^{1/2}(0.7854)$$

$Q_{CAPACITY} = 42.24 CFS > Q_{REQ}$

DETERMINE THE QUANTITY TO THE NORTHWEST GUTTER OF PROJECT



AREA = 15,598 SF = 0.358 AC, L = 207', S=0.036, %IMP=1.0

NOT TO SCALE

DETERMINE THE QUANTITY TO THE NORTHWEST GUTTER OF PROJECT

AREA = 15,598 SF = 0.358 AC, L = 207', S=0.036, %IMP=1.0

Use Hydrocalc Calculator Program

(SEE ATTACH SHEETS)

Q_{50} = 1.336 CFS Tc = 5 min

CHECK GUTTER CAPACITY:

USE 5'-WIDTH GUTTER WITH MINIMUM 2.0%SLOPE

$$Q = \frac{1.486}{n} (R)^{2/3} (S)^{1/2} A$$

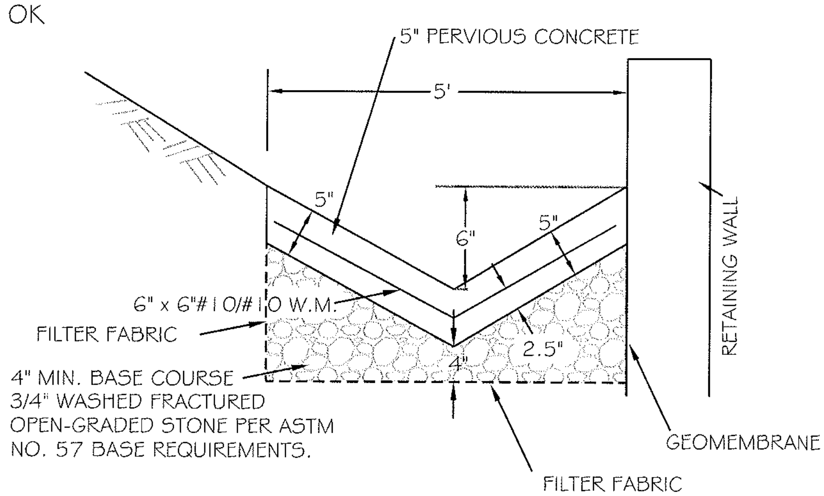
n = 0.011 A = 1.25 S= 0.02

P = 5.099 R = A/P = 0.245

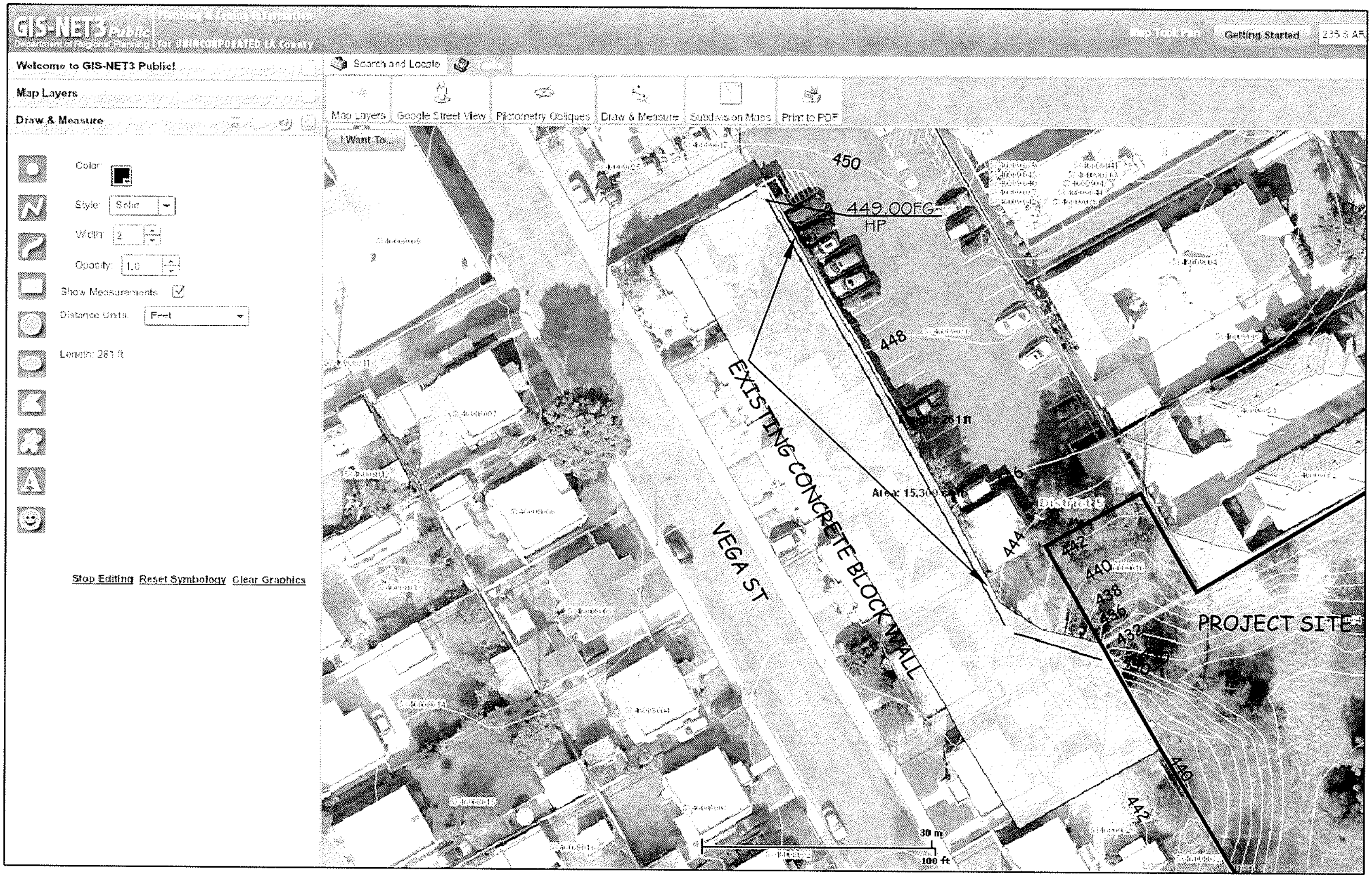
$$Q = 135.09 (0.245)^{2/3} (0.02)^{1/2} (1.25)$$

$Q_{CAPACITY}$ = 9.307CFS > Q_{REQ}

OK



DETERMINE THE QUANTITY TO THE WEST GUTTER (PORTION 1) OF PROJECT



AREA = 15,309 SF = 0.35 AC, L = 261', S=0.073, %IMP=1.0

NOT TO SCALE

DETERMINE THE QUANTITY TO THE WEST GUTTER(PORTION 1) OF PROJECT

AREA = 15,309 SF = 0.35 AC, L = 261', S=0.073, %IMP=1.0

Use Hydrocalc Calculator Program

(SEE ATTACH SHEETS)

Q_{50} = 1.306 CFS Tc = 5 min

CHECK GUTTER CAPACITY:

USE MINIMUM 2.9'-WIDTH GUTTER WITH MINIMUM 4.0%SLOPE

$$Q = \frac{1.486}{n}(R)^{2/3}(S)^{1/2}A$$

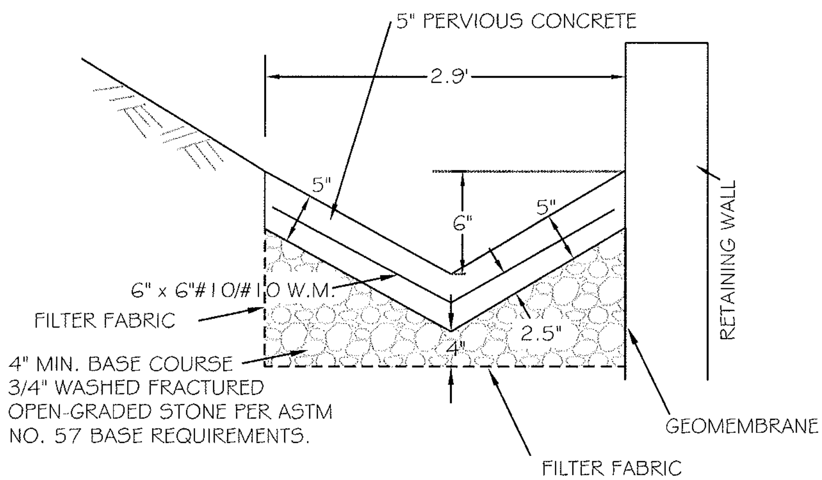
n = 0.011 A = 0.725 S= 0.04

P = 3.068 R = A/P = 0.236

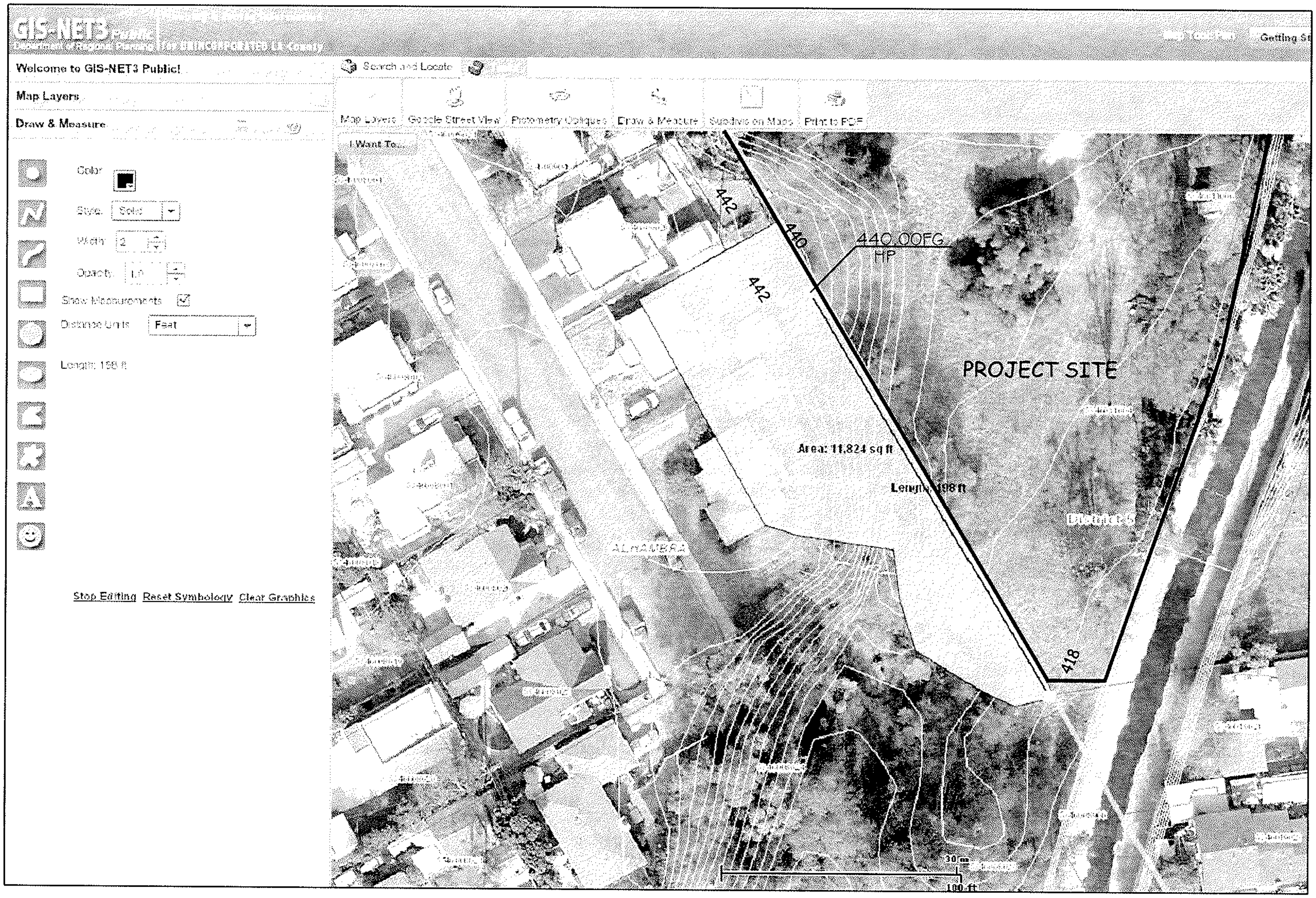
$$Q = 135.09\,(0.236)^{2/3}(0.04)^{1/2}(0.725)$$

$Q_{CAPACITY}$ = 7.445 CFS > Q_{REQ}

OK



DETERMINE THE QUANTITY TO THE WEST GUTTER(PORTION 2) OF PROJECT



AREA = 11,824 SF = 0.271 AC, L = 198', S=0.11, %IMP=1.0

N

NOT TO SCALE

DETERMINE THE QUANTITY TO THE WEST GUTTER(PORTION 2) OF PROJECT

AREA = 11,824 SF = 0.271 AC, L = 198', S=0.11, %IMP=1.0

Use Hydrocalc Calculator Program

(SEE ATTACH SHEETS)

Q_{50} = 1.0113 CFS   Tc = 5 min

CHECK GUTTER CAPACITY:

USE 5'-WIDTH GUTTER WITH MINIMUM 2.0%SLOPE

$$Q = \frac{1.486}{n} (R)^{2/3} (S)^{1/2} A$$

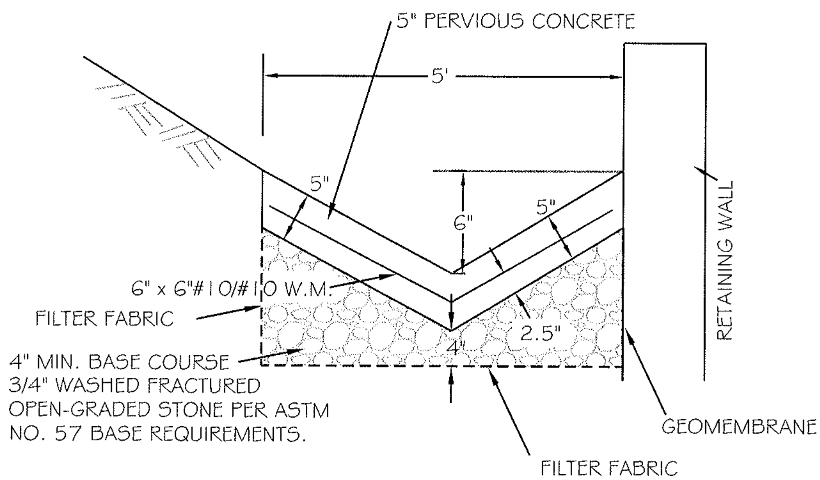
n = 0.011   A = 1.25   S= 0.02

P = 5.099   R = A/P = 0.245

$$Q = 135.09 (0.245)^{2/3} (0.02)^{1/2} (1.25)$$

$Q_{CAPACITY}$ = 9.307CFS > Q_{REQ}

OK



CHECK PIPE CAPACITY :

Q_{REQ} = 1.336+1.306+1.0113 = 3.6533 CFS

USE 12"PVC PERFORATED PIPE WITH MINIMUM 1%SLOPE

$$Q = \frac{1.486}{n} (R)^{2/3} (S)^{1/2} A$$

n = 0.009   A = 0.7854   S= 0.68

P = 3.1416   R = A/P = 0.25

$$Q = 165.11 (0.25)^{2/3} (0.68)^{1/2} (0.7854)$$

$Q_{CAPACITY}$ = 5.1463 CFS > Q_{REQ}

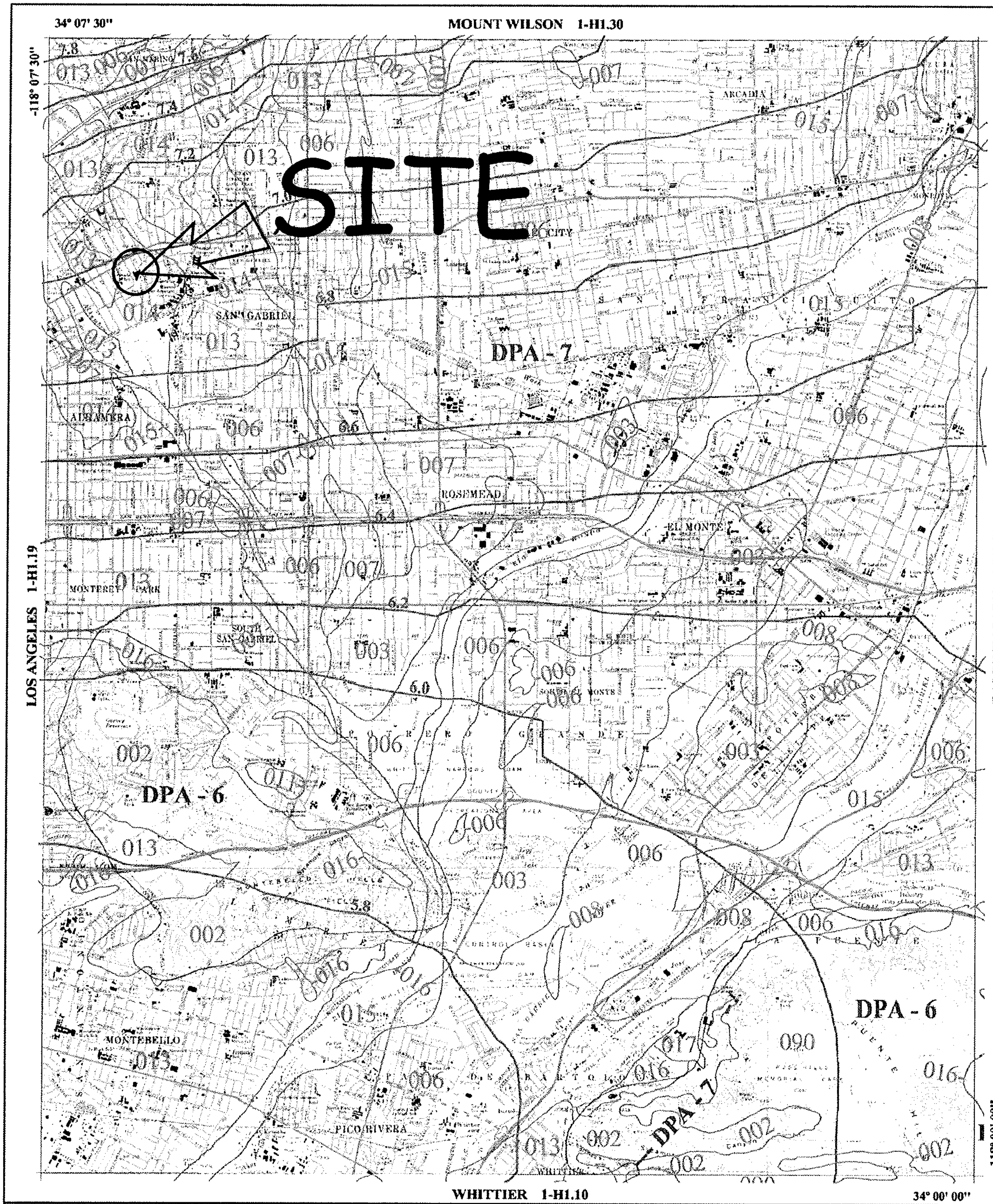
8. Summary

From the hydrology analysis, the total 50-year-frequency runoff before development is 4.4729 CFS and the runoff after development is 4.5971 CFS. The runoff will eventually drain into Alhambra Wash both pre- and post-development. Although the post-development runoff is more than before development, The runoff directly discharge into Alhambra Wash (32' wide concrete channel). The runoff increasing is very small compared to existing downstream stormdrain size. Therefore the runoff from this development will not adversely impact drainage conditions to the downstream properties. The existing drainage pattern to the downstream perperties will be maintained.

For this project, the infiltration trenches will be used for LID purposes. All overflow will directly drain into Alhambra Wash by gravity.

ATTACHMENT

A. HydroCalc Calculator PROGRAM



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

EL MONTE
50-YEAR 24-HOUR ISOHYET

1-H1.20

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Department of Public Works
dpw.lacounty.gov

search our site...

Hydrology Map
A GIS viewer application to view the data for the hydrology manual.

LAYERS

- ☐ 50yr Two Tenths (Rainfall)
- ☐ DPA Zones
- ☐ Soils 2004
- ☐ TG Page
- ☑ Final 85th Percentile, 24-hr Rainfall
- ☐ Final 95th Percentile, 24-hr Rainfall
- ☐ 1-year, 1-hour Rainfall Intensity

SEARCH

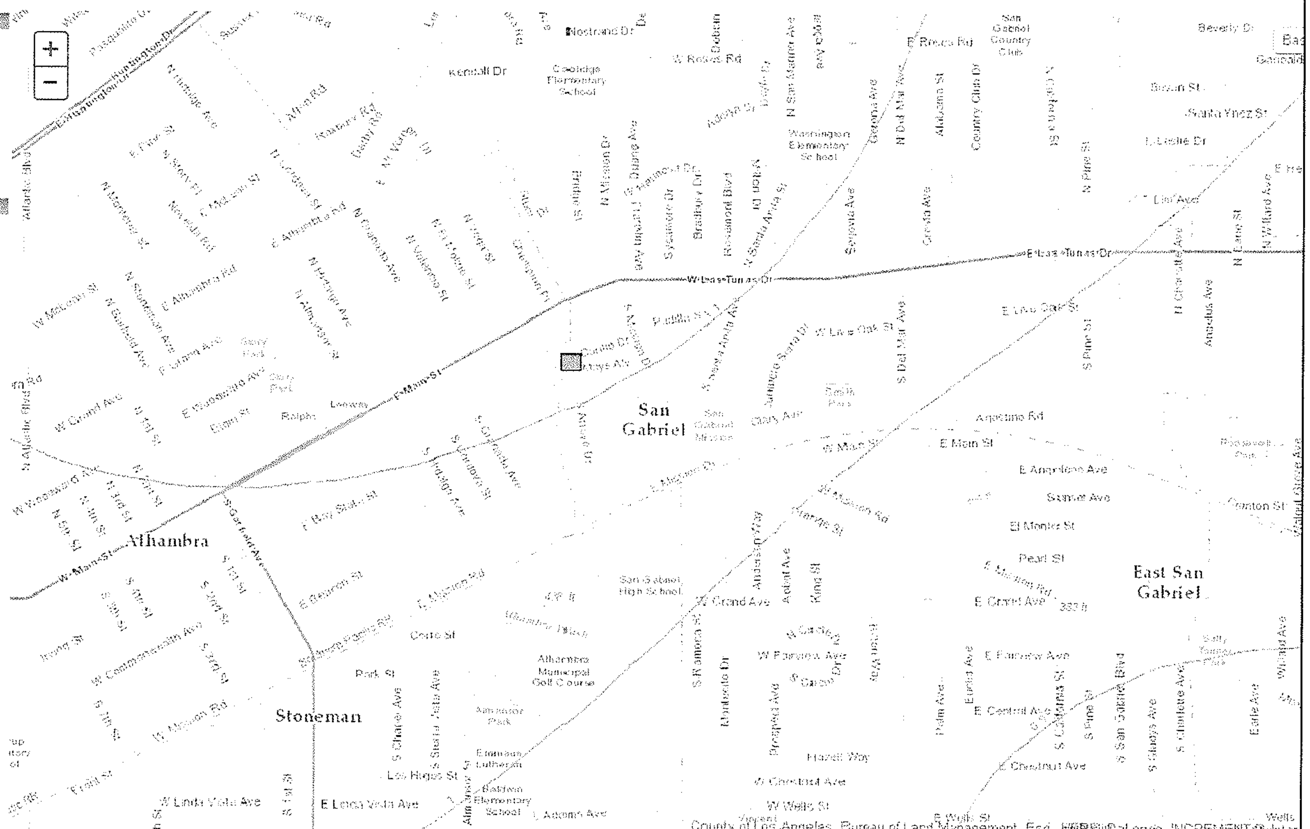
Zoom to TG Page:

Enter Address, Cross Street, or Parcel No

(ex: 900 S Fremont Ave, Fremont@Valley, 5342006904) 235 S Arroyo Dr, San Gabriel, CA Search

Address Search Results:

235 S Arroyo Dr San Gabriel CA



Peak Flow Hydrologic Analysis

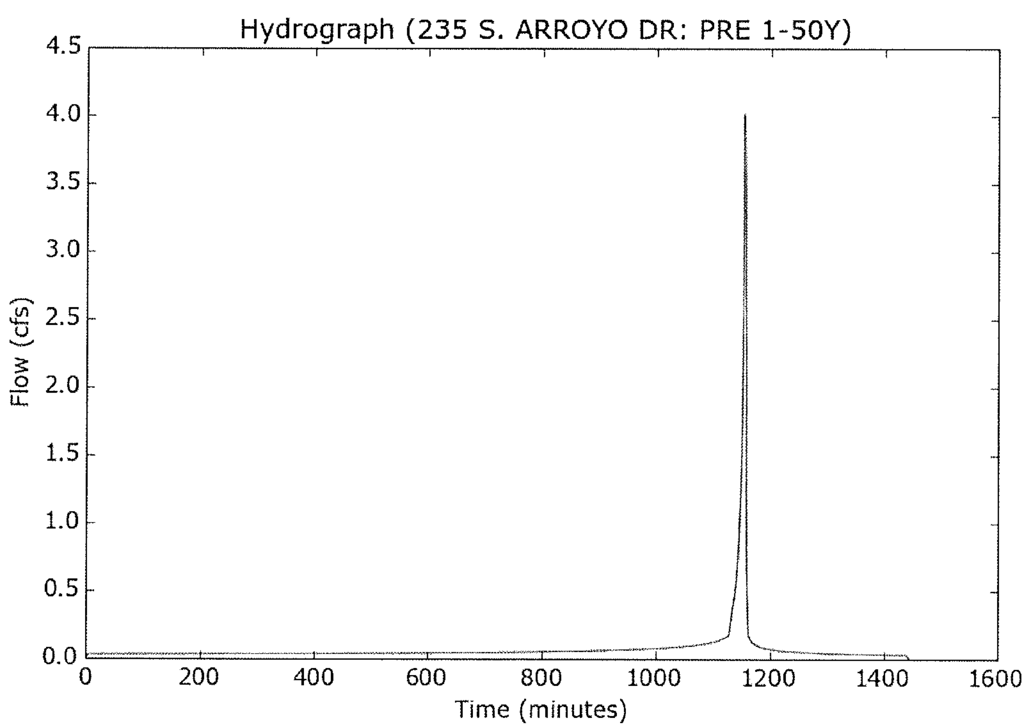
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	PRE 1-50Y
Area (ac)	1.177
Flow Path Length (ft)	268.0
Flow Path Slope (vft/hft)	0.09
50-yr Rainfall Depth (in)	6.95
Percent Impervious	0.08
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.822
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.0117
Burned Peak Flow Rate (cfs)	4.0117
24-Hr Clear Runoff Volume (ac-ft)	0.1487
24-Hr Clear Runoff Volume (cu-ft)	6478.9329



Peak Flow Hydrologic Analysis

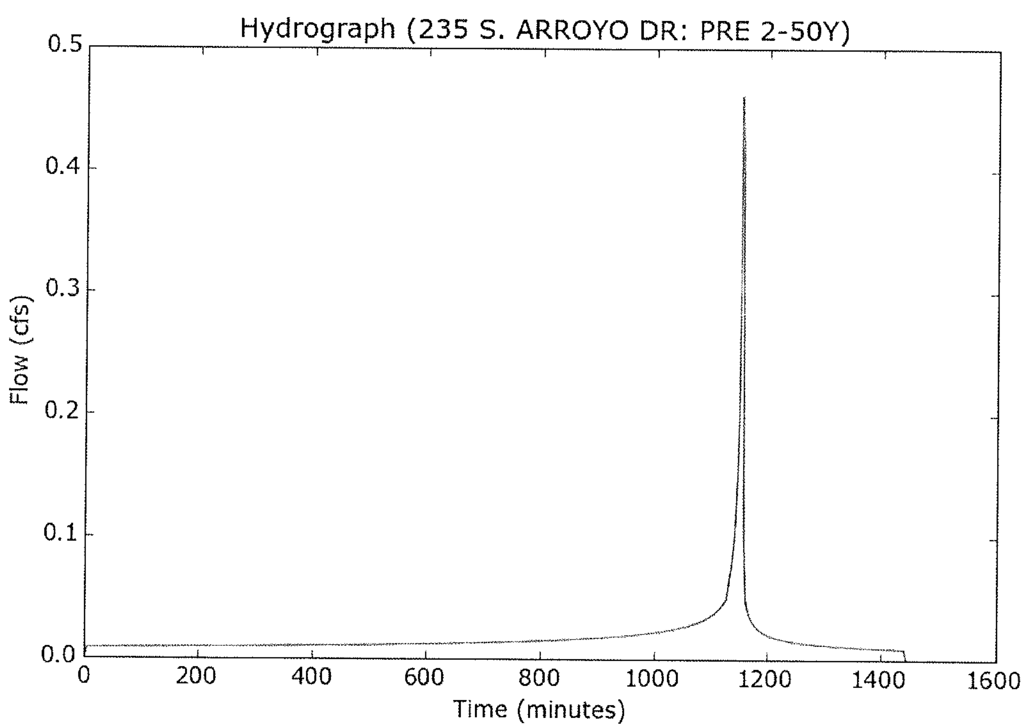
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	PRE 2-50Y
Area (ac)	0.131
Flow Path Length (ft)	47.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.95
Percent Impervious	0.4
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.8491
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4612
Burned Peak Flow Rate (cfs)	0.4612
24-Hr Clear Runoff Volume (ac-ft)	0.0344
24-Hr Clear Runoff Volume (cu-ft)	1496.3235



Peak Flow Hydrologic Analysis

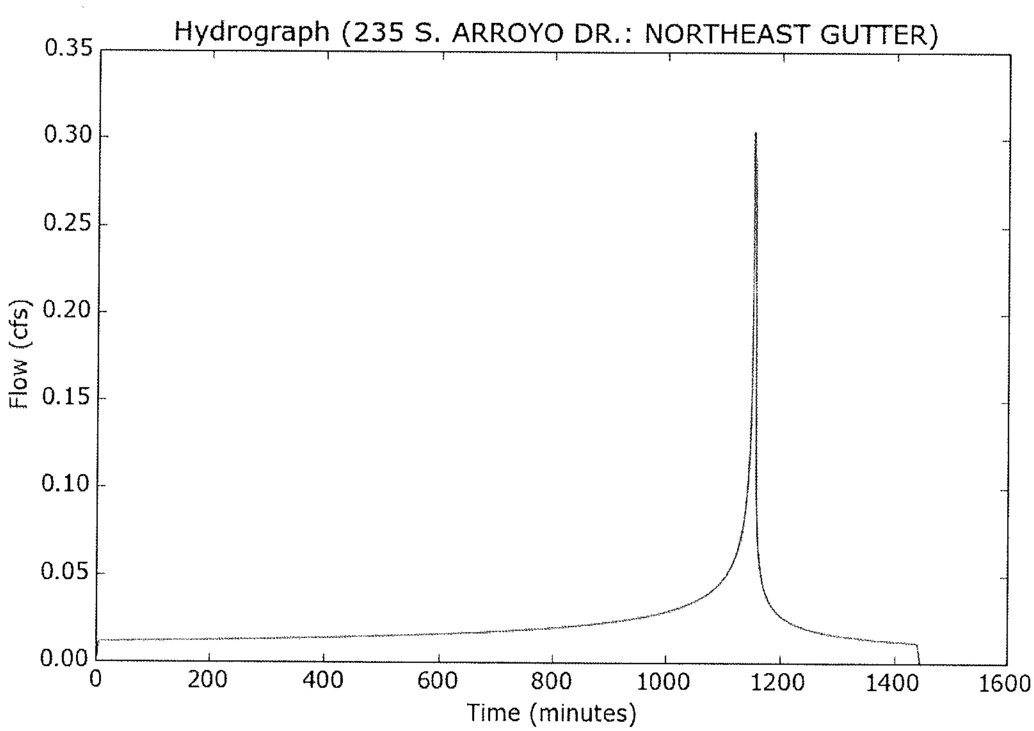
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	NORTHEAST GUTTER
Area (ac)	0.0815
Flow Path Length (ft)	82.0
Flow Path Slope (vft/hft)	0.107
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3042
Burned Peak Flow Rate (cfs)	0.3042
24-Hr Clear Runoff Volume (ac-ft)	0.0421
24-Hr Clear Runoff Volume (cu-ft)	1835.2176



Peak Flow Hydrologic Analysis

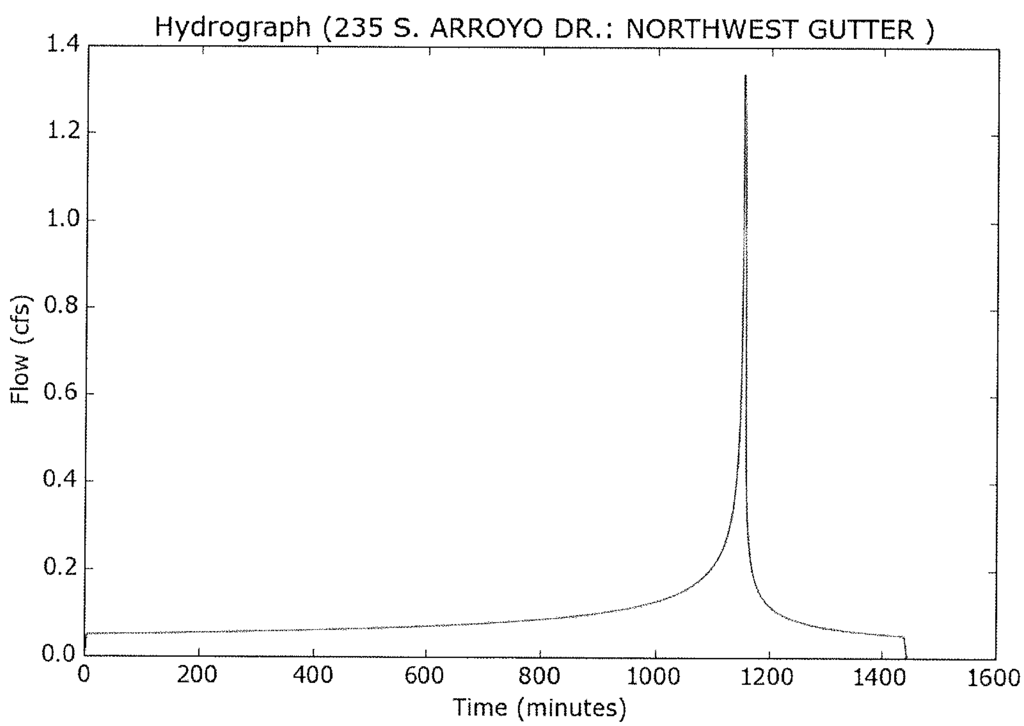
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	NORTHWEST GUTTER
Area (ac)	0.358
Flow Path Length (ft)	207.0
Flow Path Slope (vft/hft)	0.036
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.336
Burned Peak Flow Rate (cfs)	1.336
24-Hr Clear Runoff Volume (ac-ft)	0.1851
24-Hr Clear Runoff Volume (cu-ft)	8061.4465



Peak Flow Hydrologic Analysis

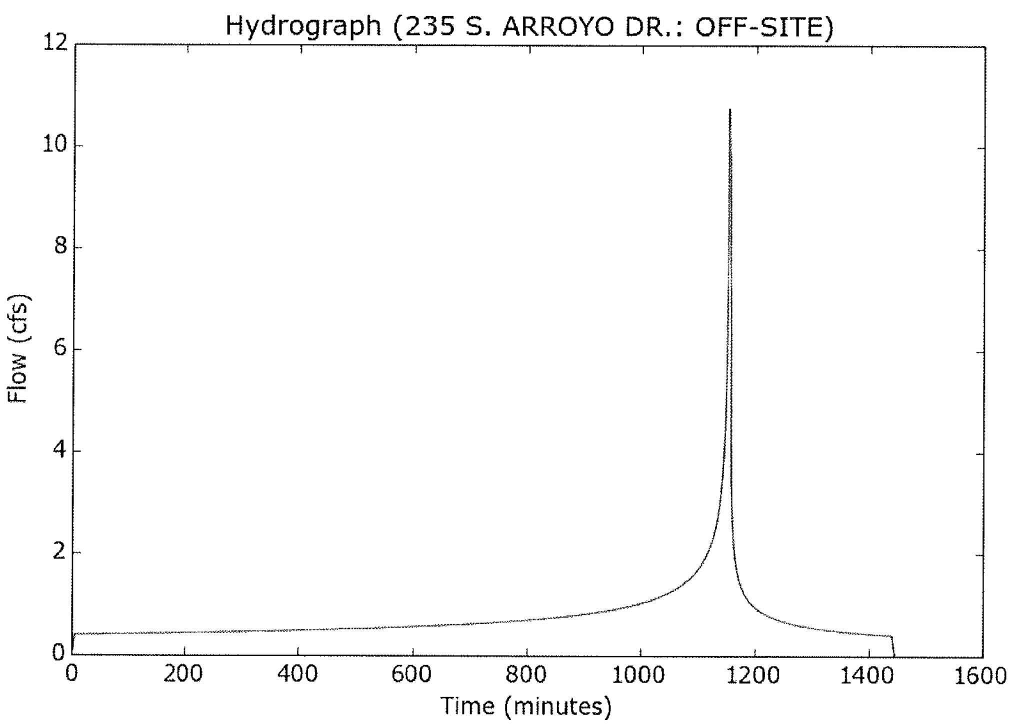
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	OFF-SITE
Area (ac)	2.86
Flow Path Length (ft)	372.0
Flow Path Slope (vft/hft)	0.0376
50-yr Rainfall Depth (in)	7.0
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.0
Peak Intensity (in/hr)	4.1764
Undeveloped Runoff Coefficient (Cu)	0.8167
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.75
Burned Peak Flow Rate (cfs)	10.75
24-Hr Clear Runoff Volume (ac-ft)	1.4891
24-Hr Clear Runoff Volume (cu-ft)	64864.8203



Peak Flow Hydrologic Analysis

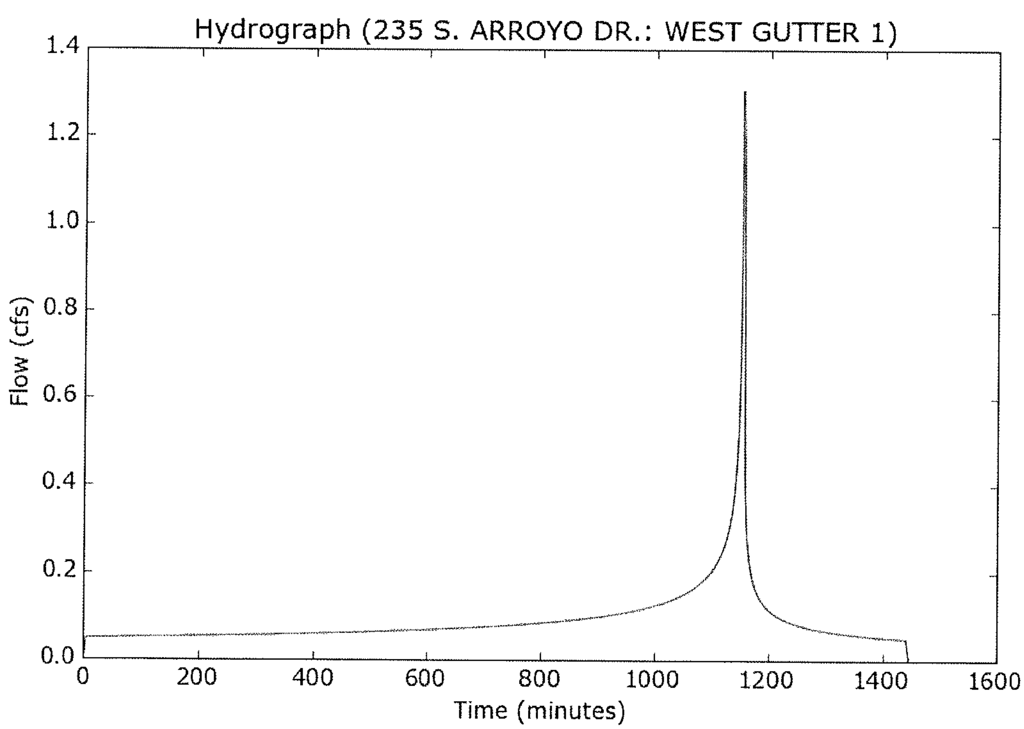
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	WEST GUTTER 1
Area (ac)	0.35
Flow Path Length (ft)	261.0
Flow Path Slope (vft/hft)	0.073
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.3062
Burned Peak Flow Rate (cfs)	1.3062
24-Hr Clear Runoff Volume (ac-ft)	0.1809
24-Hr Clear Runoff Volume (cu-ft)	7881.3025



Peak Flow Hydrologic Analysis

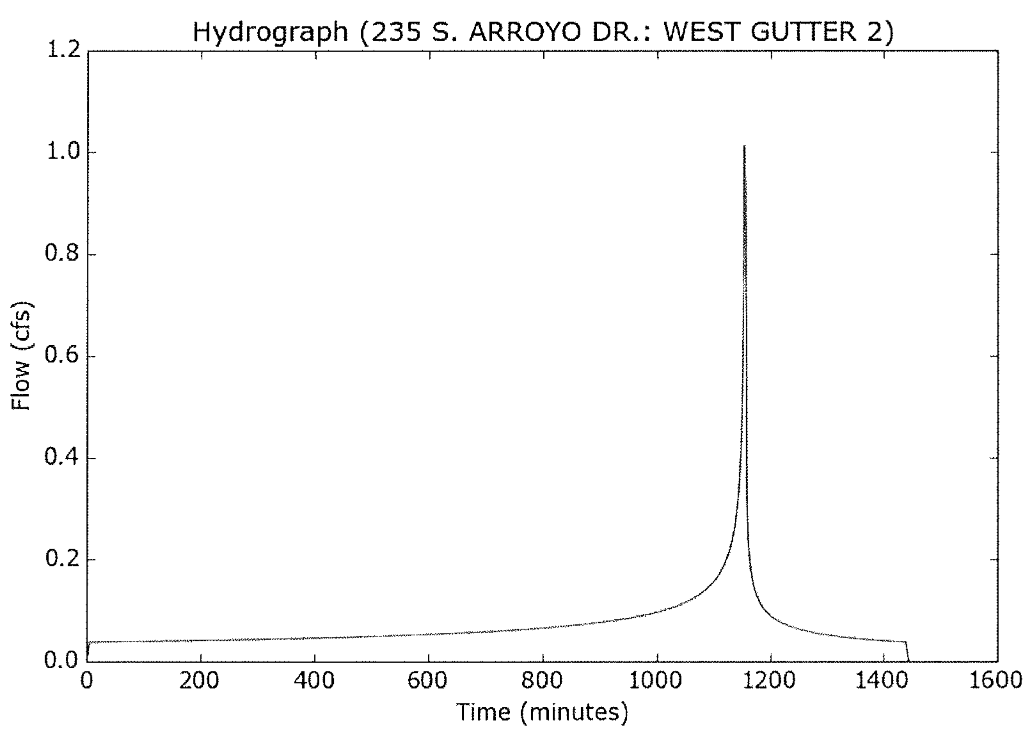
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	WEST GUTTER 2
Area (ac)	0.271
Flow Path Length (ft)	198.0
Flow Path Slope (vft/hft)	0.11
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0113
Burned Peak Flow Rate (cfs)	1.0113
24-Hr Clear Runoff Volume (ac-ft)	0.1401
24-Hr Clear Runoff Volume (cu-ft)	6102.3799



Peak Flow Hydrologic Analysis

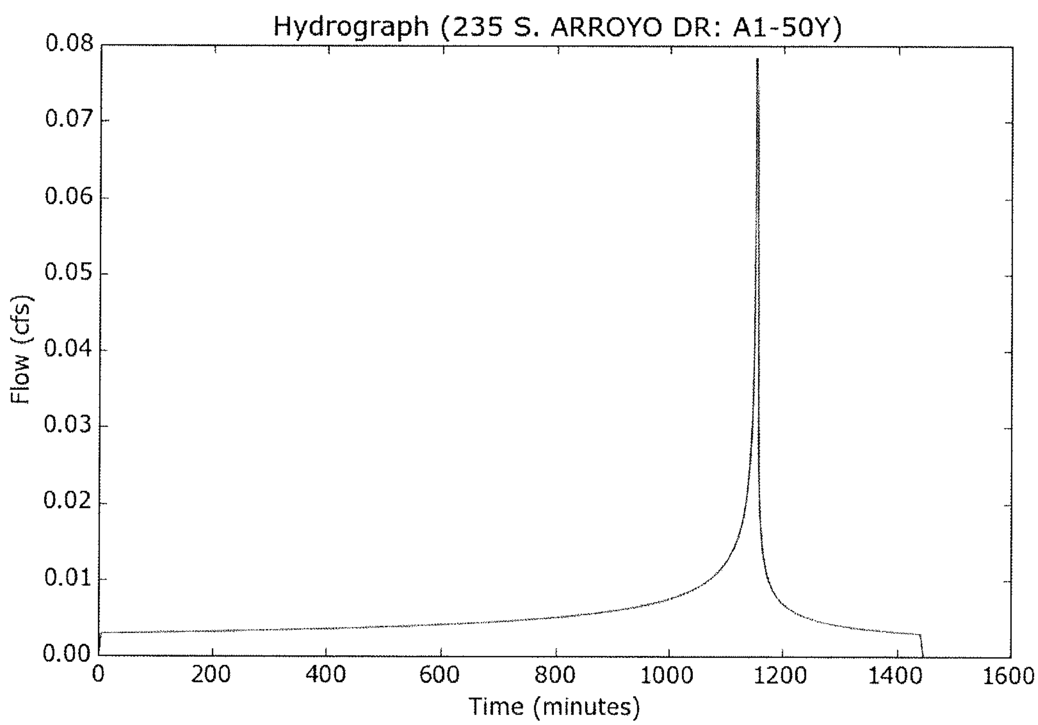
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A1-50Y
Area (ac)	0.021
Flow Path Length (ft)	23.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0784
Burned Peak Flow Rate (cfs)	0.0784
24-Hr Clear Runoff Volume (ac-ft)	0.0109
24-Hr Clear Runoff Volume (cu-ft)	472.8781



Peak Flow Hydrologic Analysis

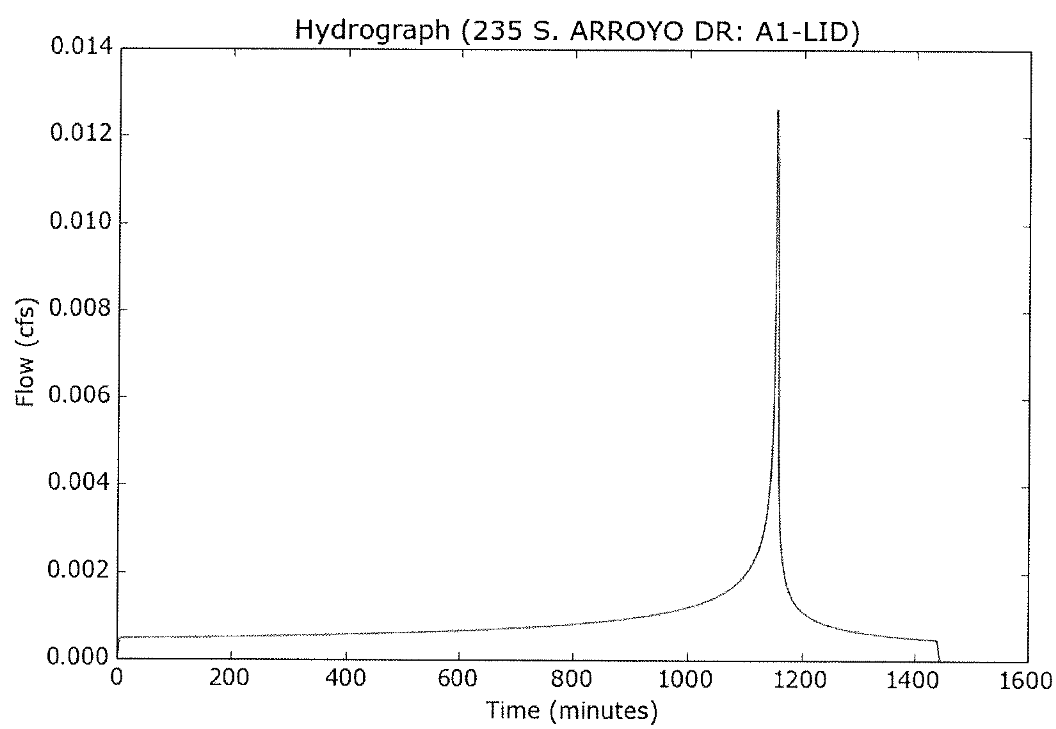
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A1-LID
Area (ac)	0.021
Flow Path Length (ft)	23.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0126
Burned Peak Flow Rate (cfs)	0.0126
24-Hr Clear Runoff Volume (ac-ft)	0.0017
24-Hr Clear Runoff Volume (cu-ft)	76.2048



Peak Flow Hydrologic Analysis

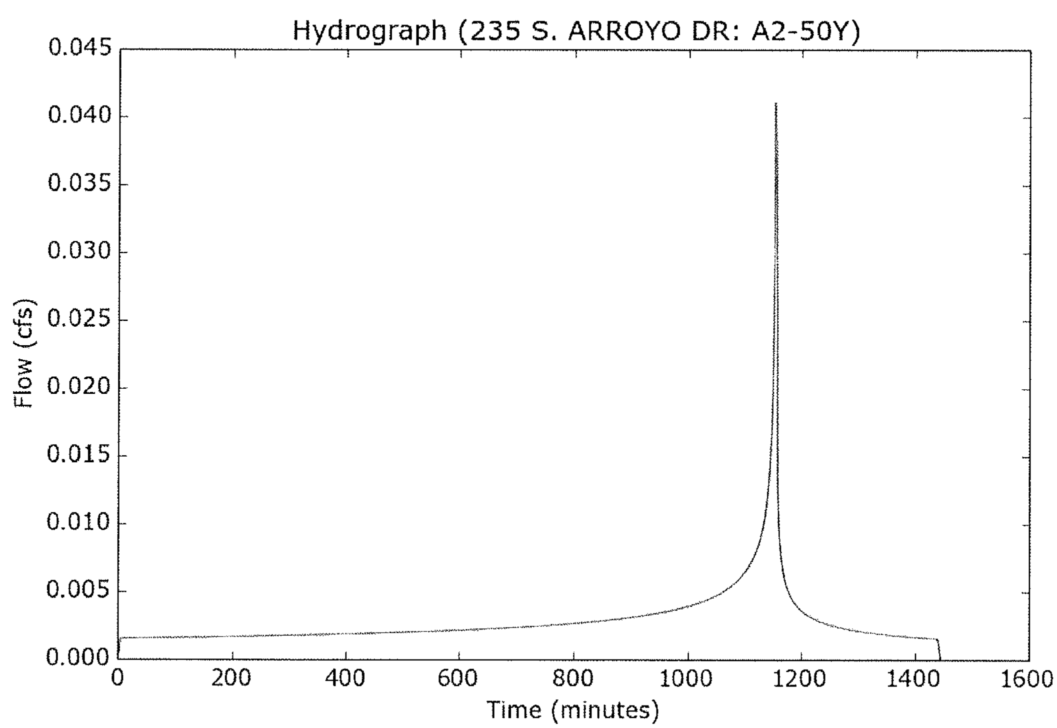
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A2-50Y
Area (ac)	0.011
Flow Path Length (ft)	16.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0411
Burned Peak Flow Rate (cfs)	0.0411
24-Hr Clear Runoff Volume (ac-ft)	0.0057
24-Hr Clear Runoff Volume (cu-ft)	247.6981



Peak Flow Hydrologic Analysis

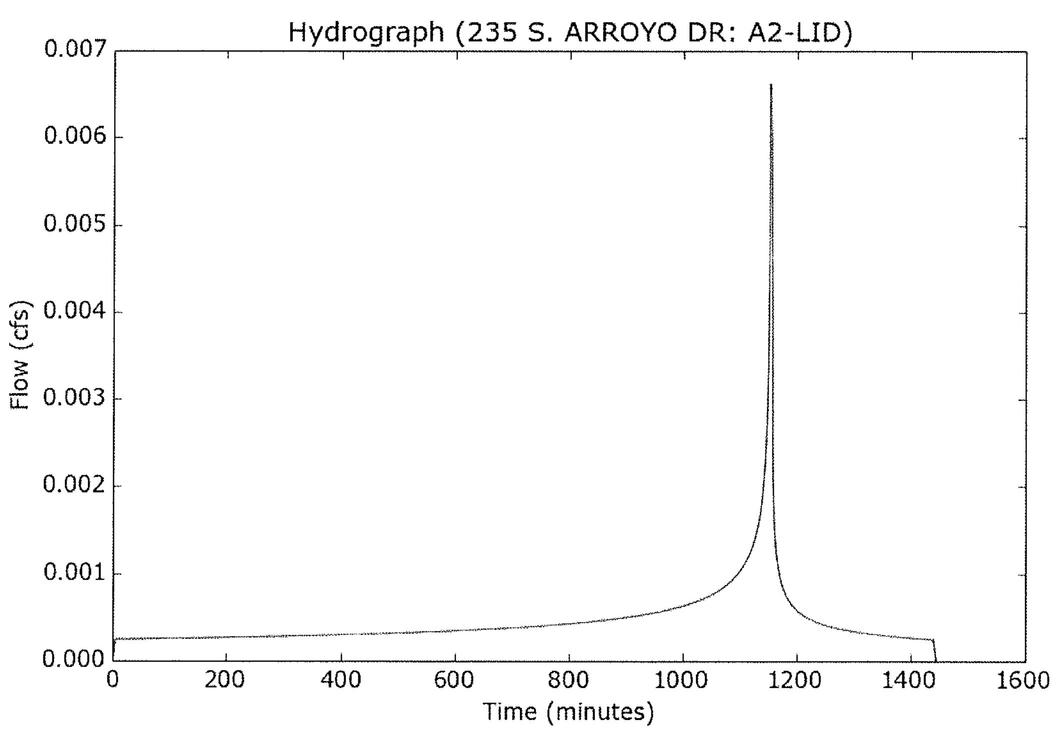
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A2-LID
Area (ac)	0.011
Flow Path Length (ft)	16.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0066
Burned Peak Flow Rate (cfs)	0.0066
24-Hr Clear Runoff Volume (ac-ft)	0.0009
24-Hr Clear Runoff Volume (cu-ft)	39.9168



Peak Flow Hydrologic Analysis

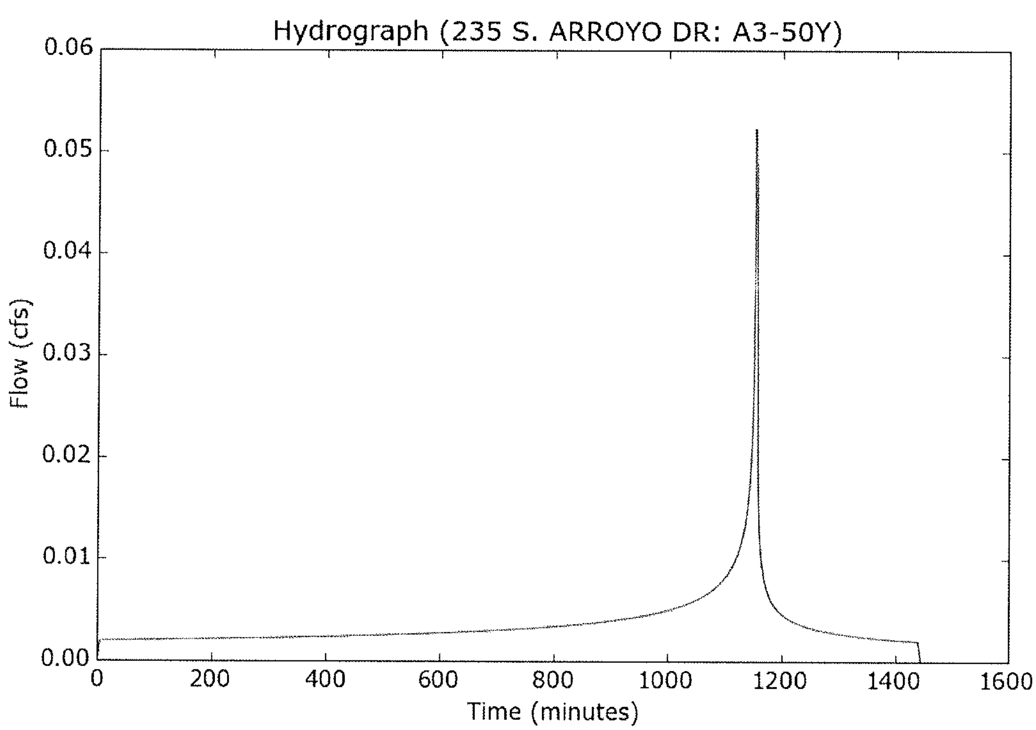
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A3-50Y
Area (ac)	0.014
Flow Path Length (ft)	33.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0522
Burned Peak Flow Rate (cfs)	0.0522
24-Hr Clear Runoff Volume (ac-ft)	0.0072
24-Hr Clear Runoff Volume (cu-ft)	315.2521



Peak Flow Hydrologic Analysis

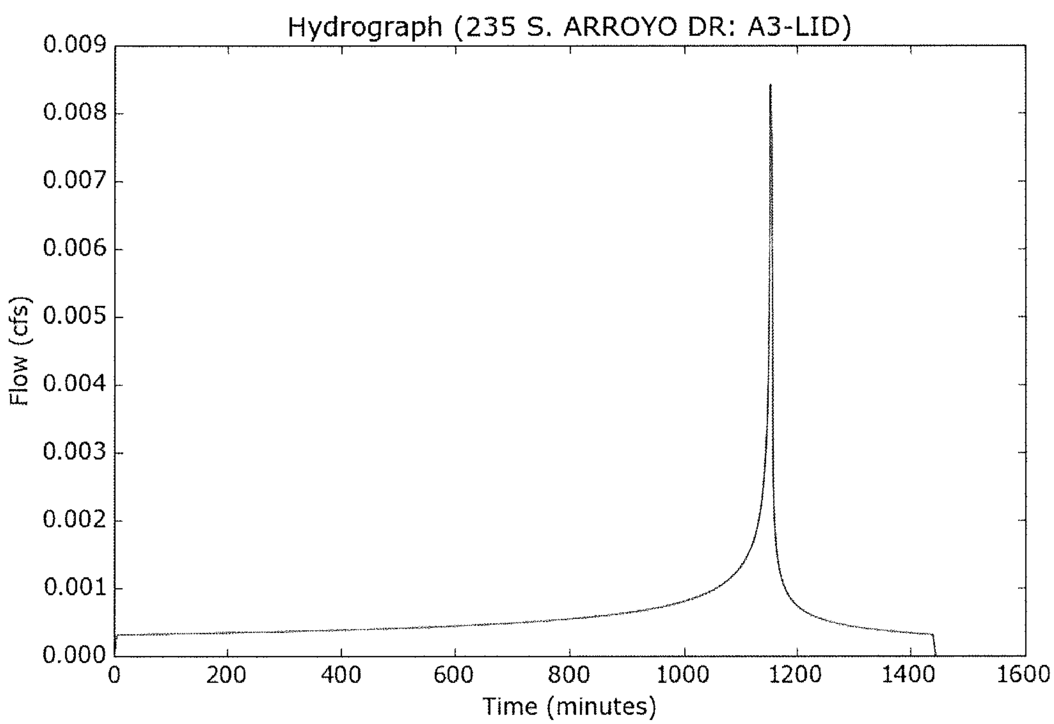
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A3-LID
Area (ac)	0.014
Flow Path Length (ft)	33.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0084
Burned Peak Flow Rate (cfs)	0.0084
24-Hr Clear Runoff Volume (ac-ft)	0.0012
24-Hr Clear Runoff Volume (cu-ft)	50.8032



Peak Flow Hydrologic Analysis

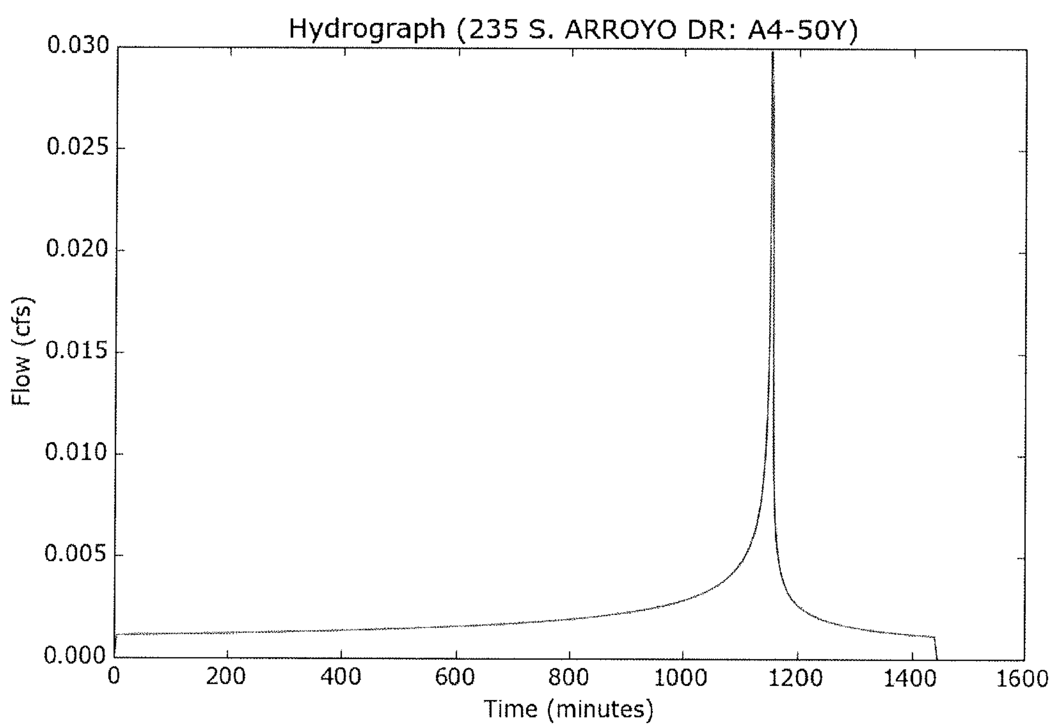
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A4-50Y
Area (ac)	0.008
Flow Path Length (ft)	17.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0299
Burned Peak Flow Rate (cfs)	0.0299
24-Hr Clear Runoff Volume (ac-ft)	0.0041
24-Hr Clear Runoff Volume (cu-ft)	180.1441



Peak Flow Hydrologic Analysis

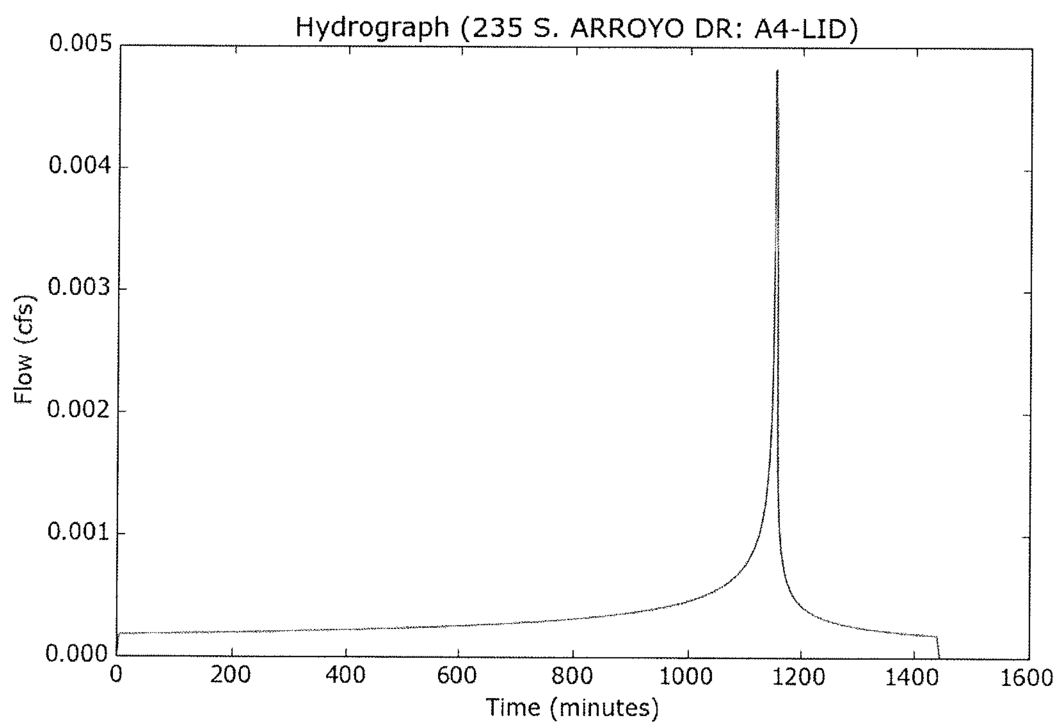
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A4-LID
Area (ac)	0.008
Flow Path Length (ft)	17.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0048
Burned Peak Flow Rate (cfs)	0.0048
24-Hr Clear Runoff Volume (ac-ft)	0.0007
24-Hr Clear Runoff Volume (cu-ft)	29.0304



Peak Flow Hydrologic Analysis

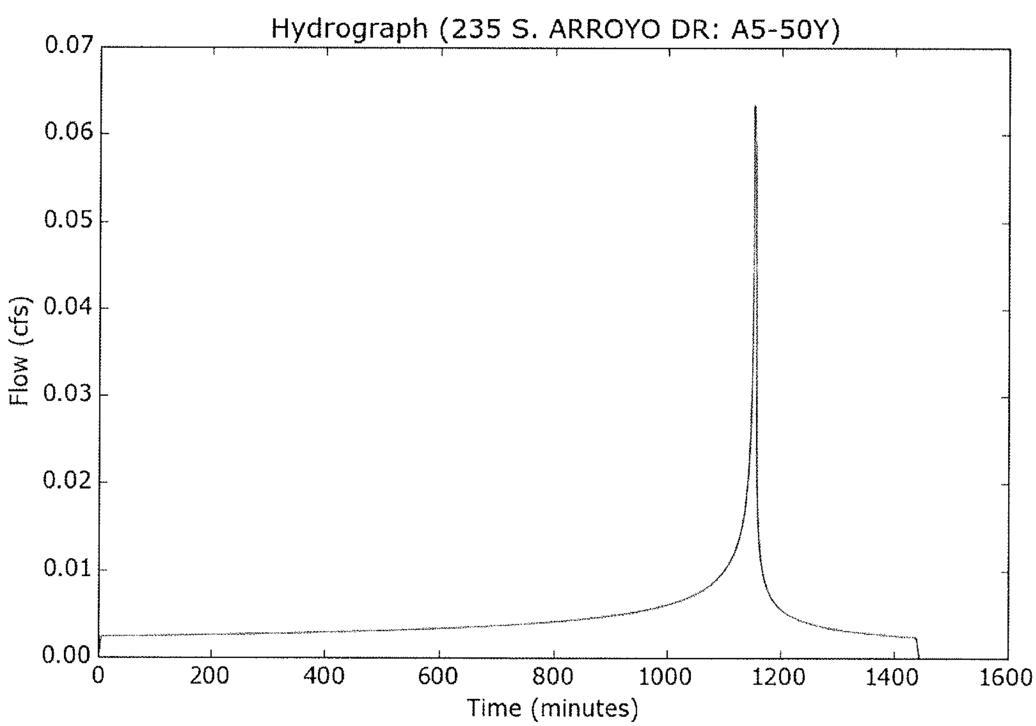
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A5-50Y
Area (ac)	0.017
Flow Path Length (ft)	21.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0634
Burned Peak Flow Rate (cfs)	0.0634
24-Hr Clear Runoff Volume (ac-ft)	0.0088
24-Hr Clear Runoff Volume (cu-ft)	382.8061



Peak Flow Hydrologic Analysis

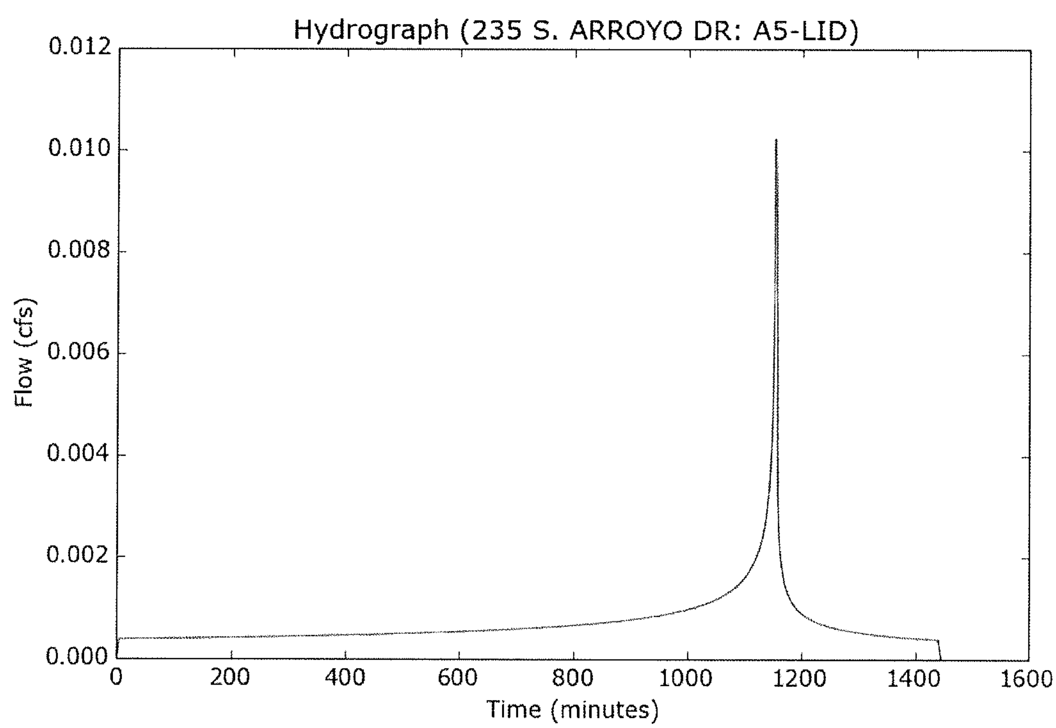
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A5-LID
Area (ac)	0.017
Flow Path Length (ft)	21.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0102
Burned Peak Flow Rate (cfs)	0.0102
24-Hr Clear Runoff Volume (ac-ft)	0.0014
24-Hr Clear Runoff Volume (cu-ft)	61.6896



Peak Flow Hydrologic Analysis

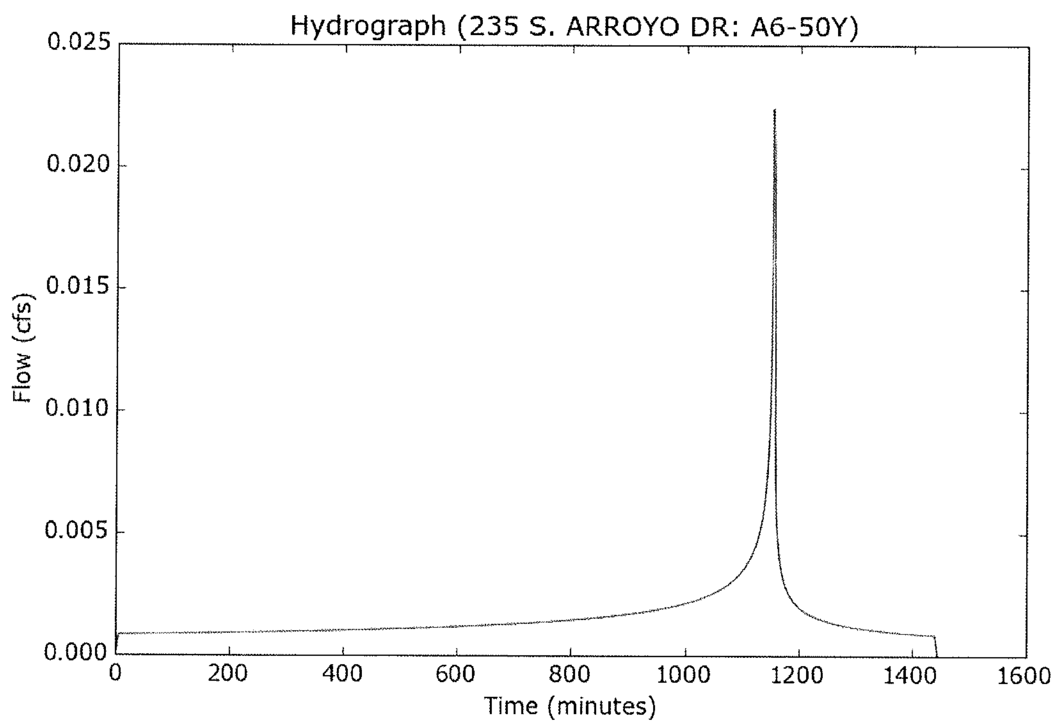
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A6-50Y
Area (ac)	0.006
Flow Path Length (ft)	11.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0224
Burned Peak Flow Rate (cfs)	0.0224
24-Hr Clear Runoff Volume (ac-ft)	0.0031
24-Hr Clear Runoff Volume (cu-ft)	135.108



Peak Flow Hydrologic Analysis

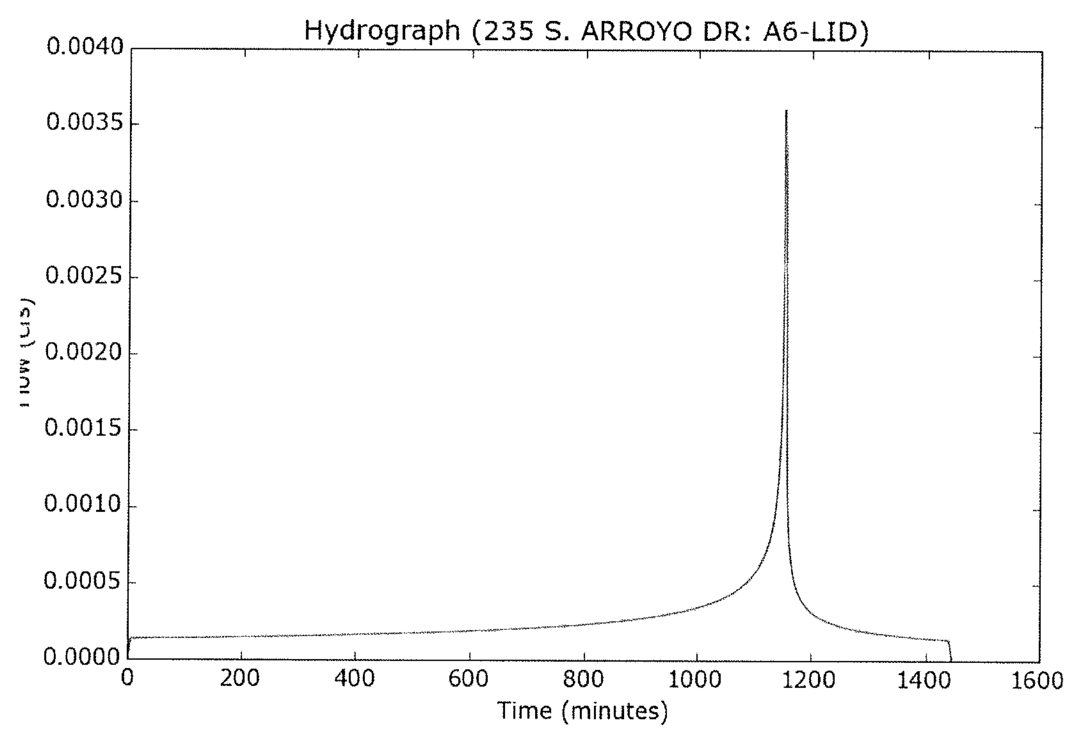
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A6-LID
Area (ac)	0.006
Flow Path Length (ft)	11.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0036
Burned Peak Flow Rate (cfs)	0.0036
24-Hr Clear Runoff Volume (ac-ft)	0.0005
24-Hr Clear Runoff Volume (cu-ft)	21.7728



Peak Flow Hydrologic Analysis

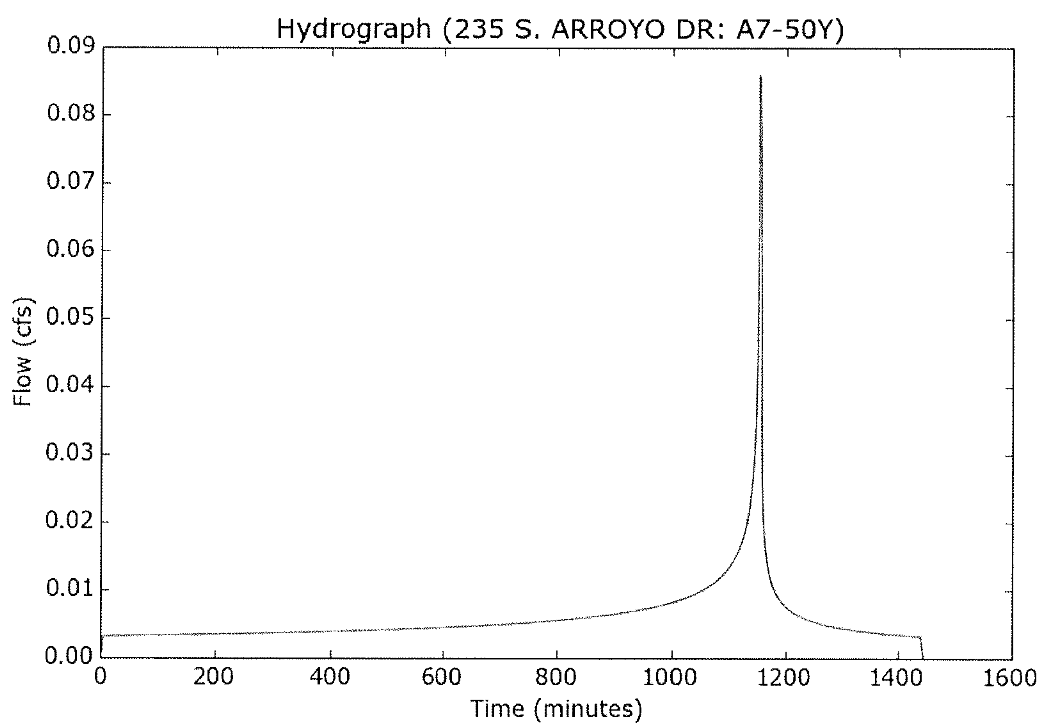
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A7-50Y
Area (ac)	0.023
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0858
Burned Peak Flow Rate (cfs)	0.0858
24-Hr Clear Runoff Volume (ac-ft)	0.0119
24-Hr Clear Runoff Volume (cu-ft)	517.9142



Peak Flow Hydrologic Analysis

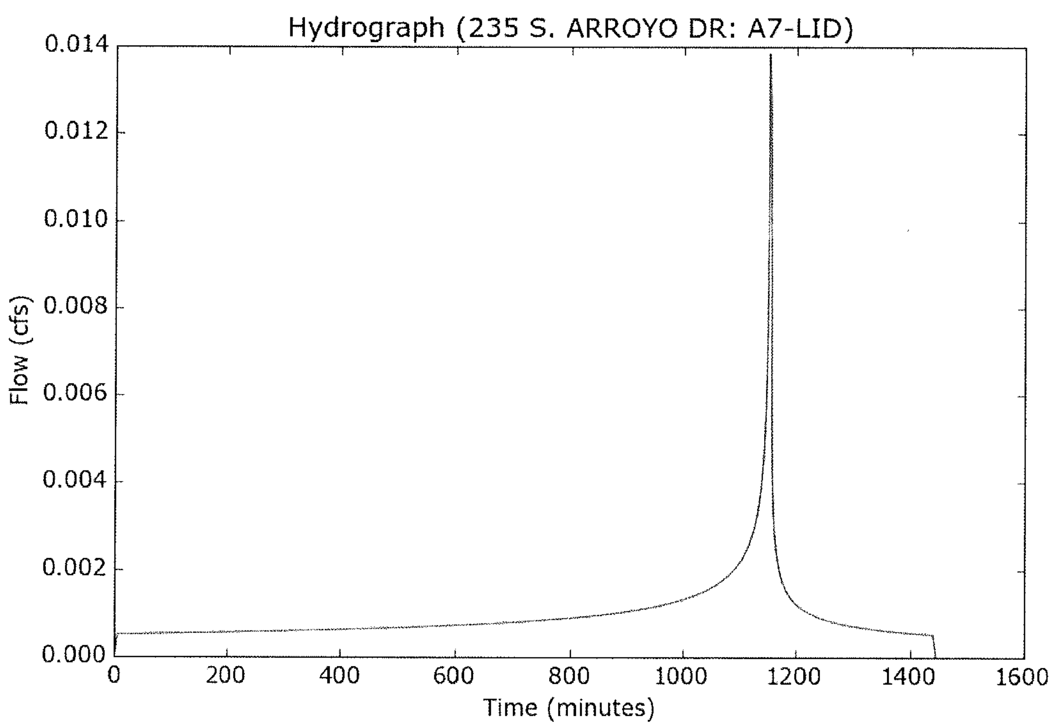
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A7-LID
Area (ac)	0.023
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0138
Burned Peak Flow Rate (cfs)	0.0138
24-Hr Clear Runoff Volume (ac-ft)	0.0019
24-Hr Clear Runoff Volume (cu-ft)	83.4624



Peak Flow Hydrologic Analysis

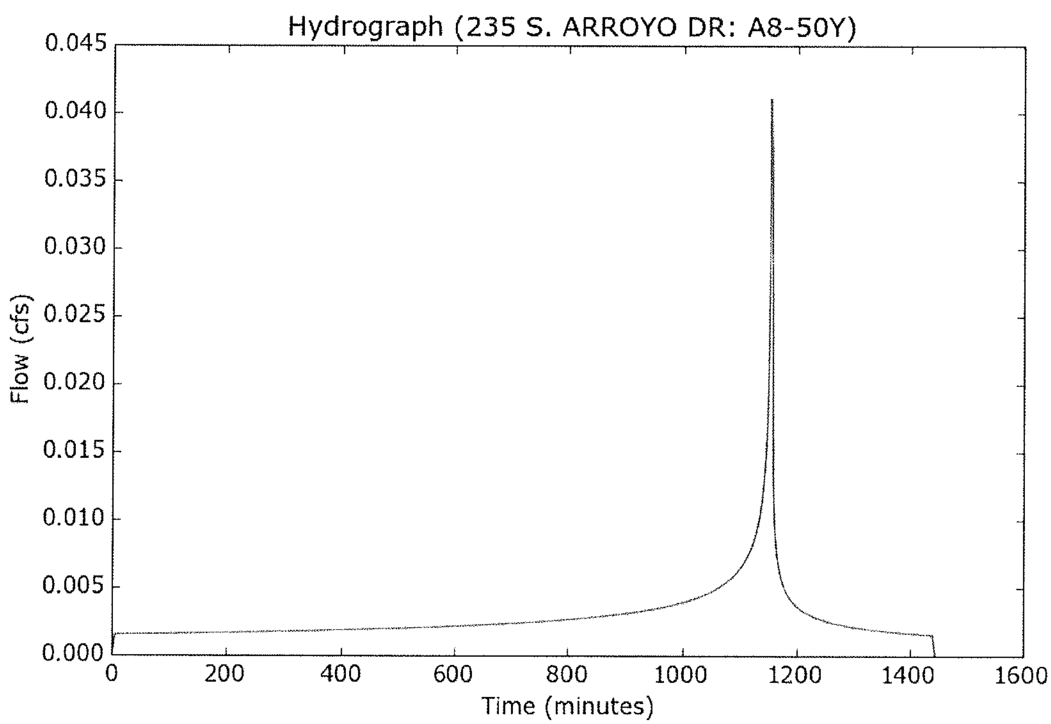
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A8-50Y
Area (ac)	0.011
Flow Path Length (ft)	24.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0411
Burned Peak Flow Rate (cfs)	0.0411
24-Hr Clear Runoff Volume (ac-ft)	0.0057
24-Hr Clear Runoff Volume (cu-ft)	247.6981



Peak Flow Hydrologic Analysis

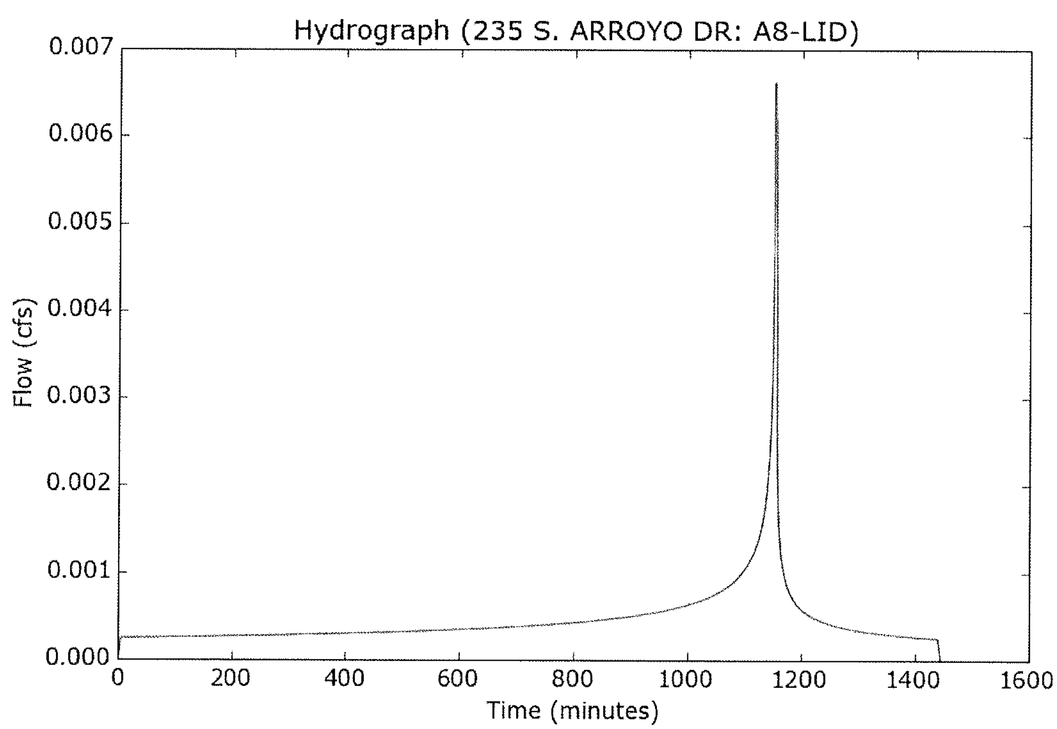
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A8-LID
Area (ac)	0.011
Flow Path Length (ft)	24.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0066
Burned Peak Flow Rate (cfs)	0.0066
24-Hr Clear Runoff Volume (ac-ft)	0.0009
24-Hr Clear Runoff Volume (cu-ft)	39.9168



Peak Flow Hydrologic Analysis

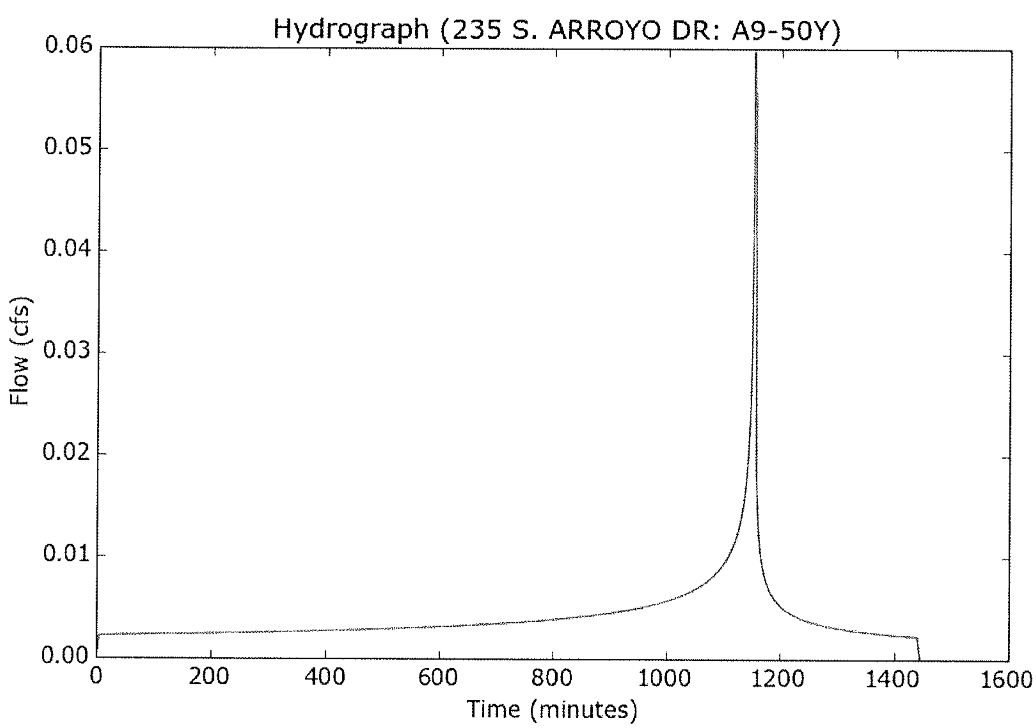
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A9-50Y
Area (ac)	0.016
Flow Path Length (ft)	22.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0597
Burned Peak Flow Rate (cfs)	0.0597
24-Hr Clear Runoff Volume (ac-ft)	0.0083
24-Hr Clear Runoff Volume (cu-ft)	360.2881



Peak Flow Hydrologic Analysis

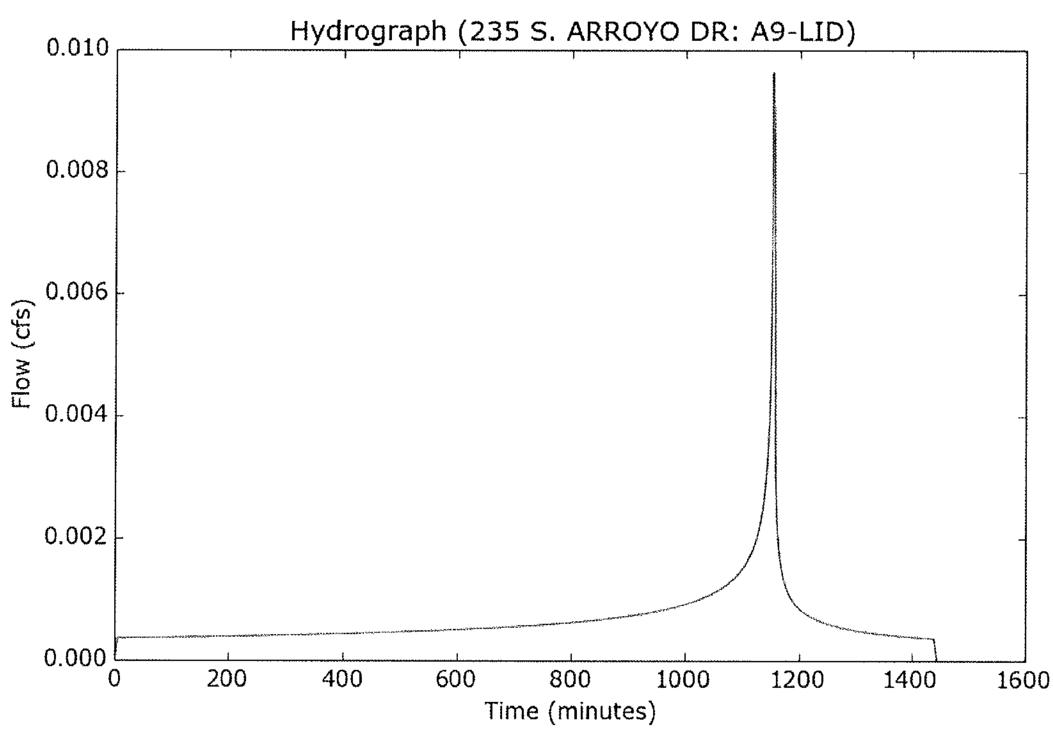
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A9-LID
Area (ac)	0.016
Flow Path Length (ft)	22.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0096
Burned Peak Flow Rate (cfs)	0.0096
24-Hr Clear Runoff Volume (ac-ft)	0.0013
24-Hr Clear Runoff Volume (cu-ft)	58.0608



Peak Flow Hydrologic Analysis

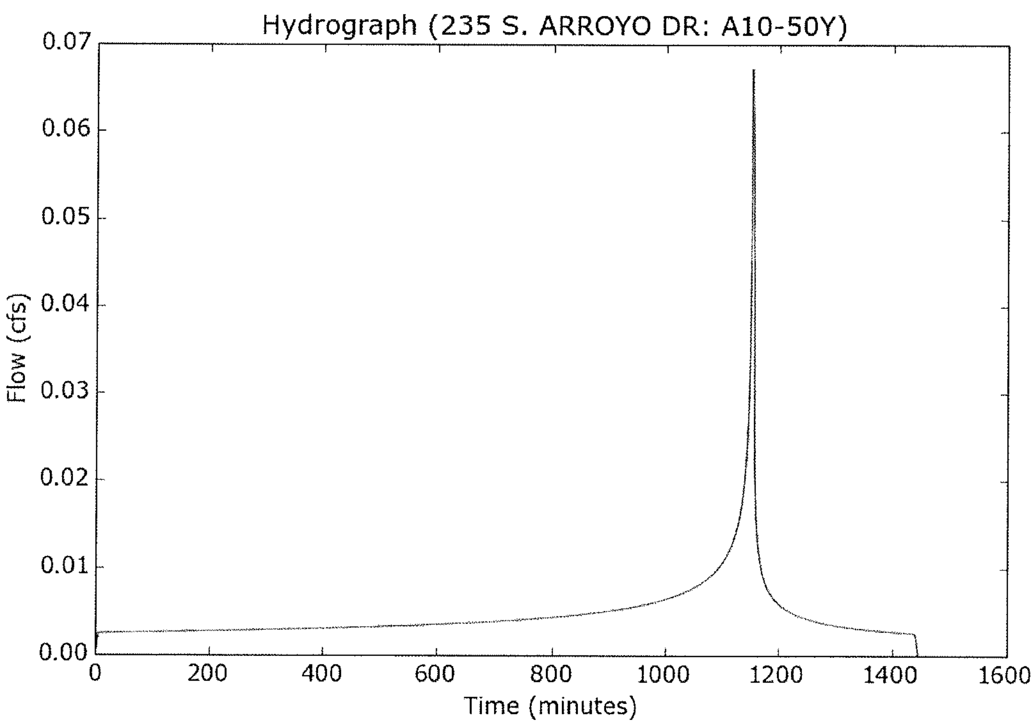
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A10-50Y
Area (ac)	0.018
Flow Path Length (ft)	38.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0672
Burned Peak Flow Rate (cfs)	0.0672
24-Hr Clear Runoff Volume (ac-ft)	0.0093
24-Hr Clear Runoff Volume (cu-ft)	405.3241



Peak Flow Hydrologic Analysis

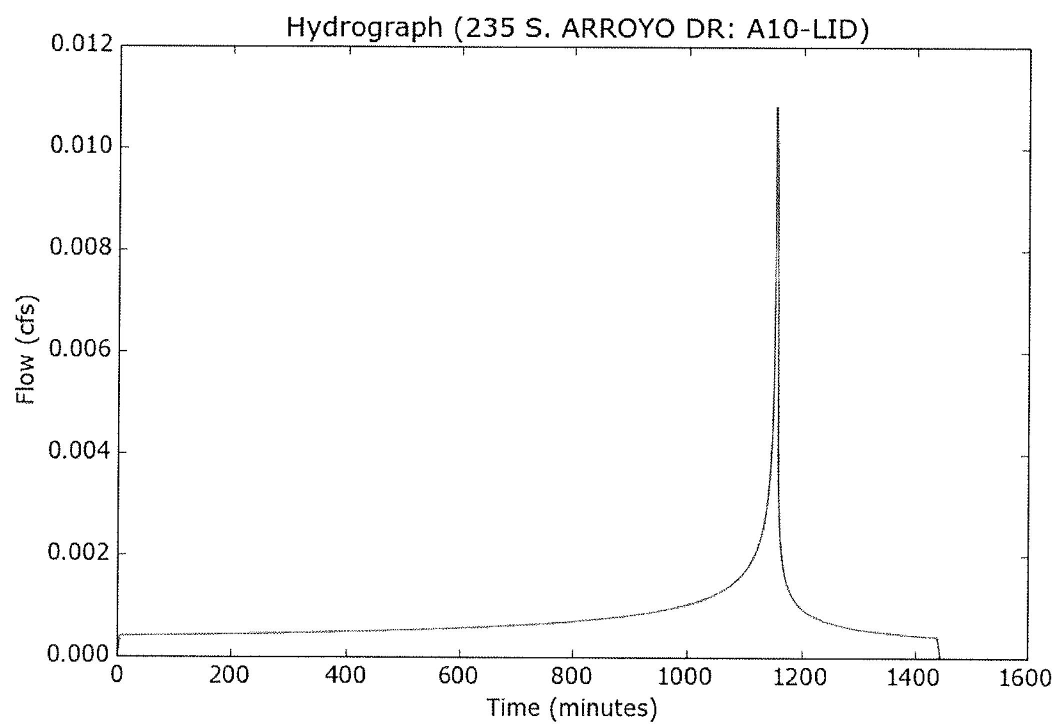
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A10-LID
Area (ac)	0.018
Flow Path Length (ft)	38.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0108
Burned Peak Flow Rate (cfs)	0.0108
24-Hr Clear Runoff Volume (ac-ft)	0.0015
24-Hr Clear Runoff Volume (cu-ft)	65.3184



Peak Flow Hydrologic Analysis

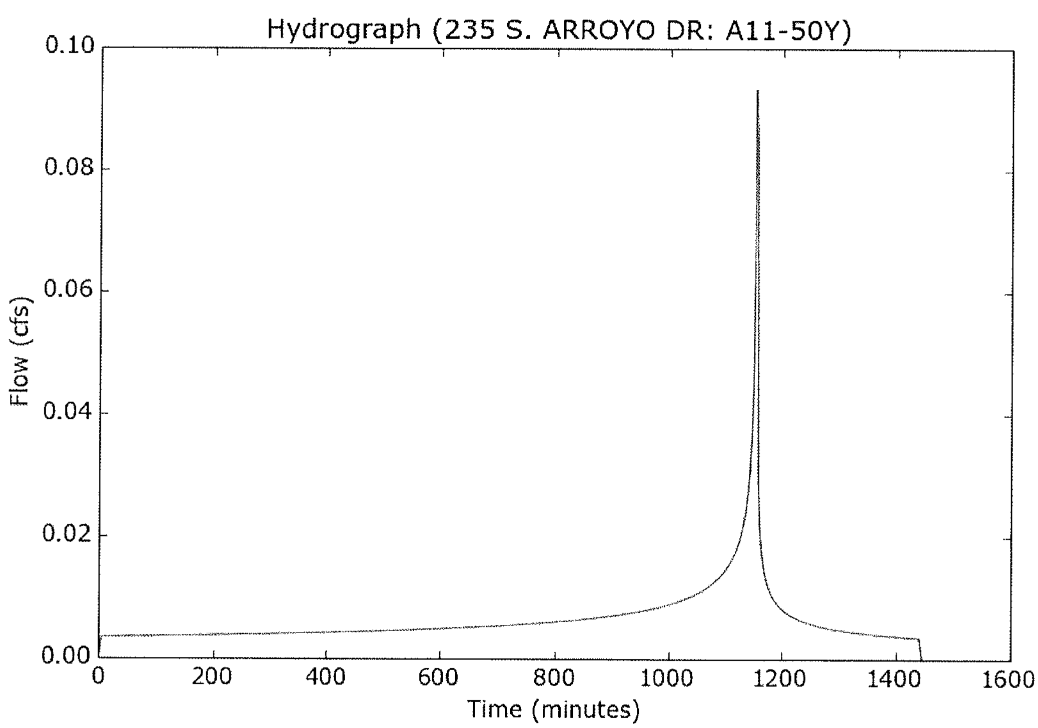
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A11-50Y
Area (ac)	0.025
Flow Path Length (ft)	15.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0933
Burned Peak Flow Rate (cfs)	0.0933
24-Hr Clear Runoff Volume (ac-ft)	0.0129
24-Hr Clear Runoff Volume (cu-ft)	562.9502



Peak Flow Hydrologic Analysis

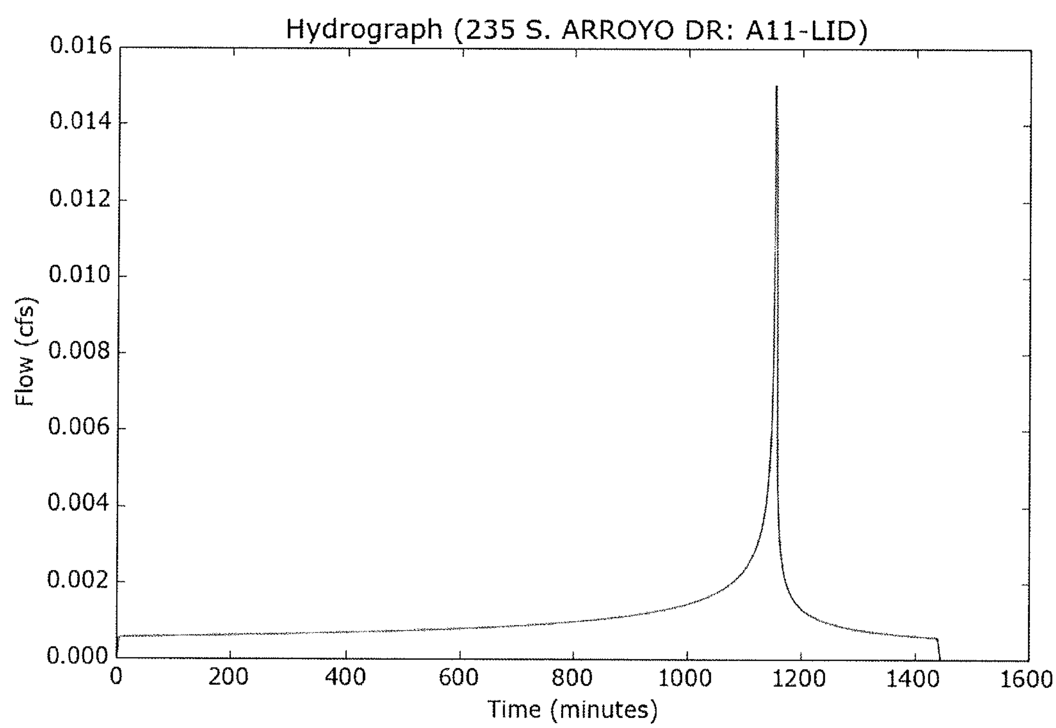
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A11-LID
Area (ac)	0.025
Flow Path Length (ft)	15.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.015
Burned Peak Flow Rate (cfs)	0.015
24-Hr Clear Runoff Volume (ac-ft)	0.0021
24-Hr Clear Runoff Volume (cu-ft)	90.72



Peak Flow Hydrologic Analysis

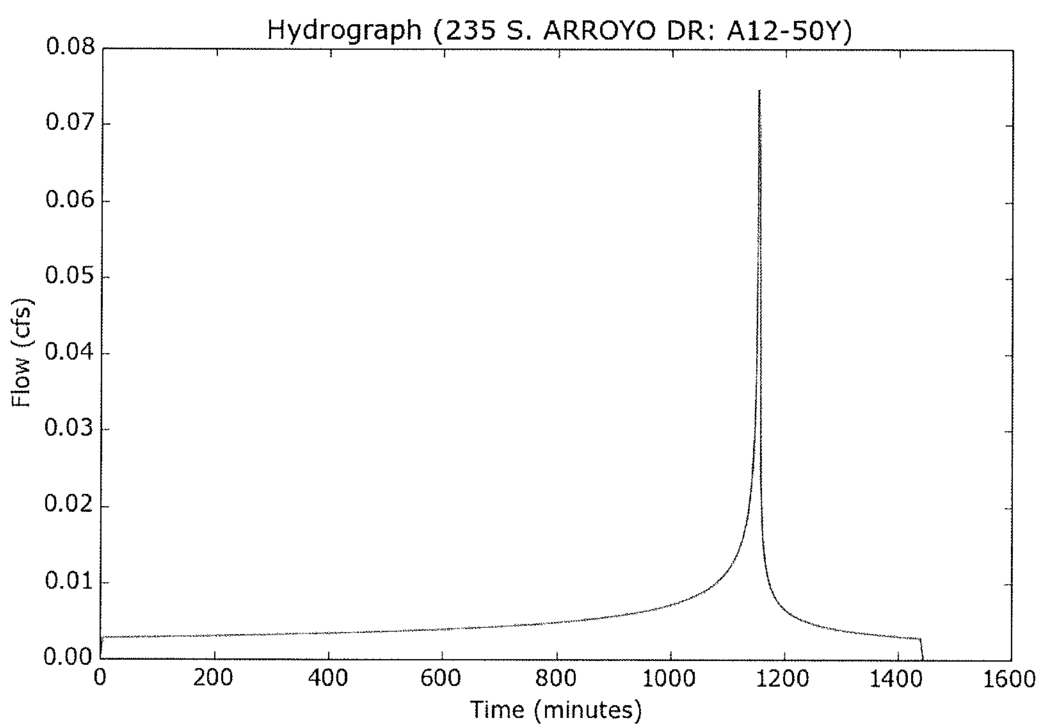
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A12-50Y
Area (ac)	0.02
Flow Path Length (ft)	39.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0746
Burned Peak Flow Rate (cfs)	0.0746
24-Hr Clear Runoff Volume (ac-ft)	0.0103
24-Hr Clear Runoff Volume (cu-ft)	450.3601



Peak Flow Hydrologic Analysis

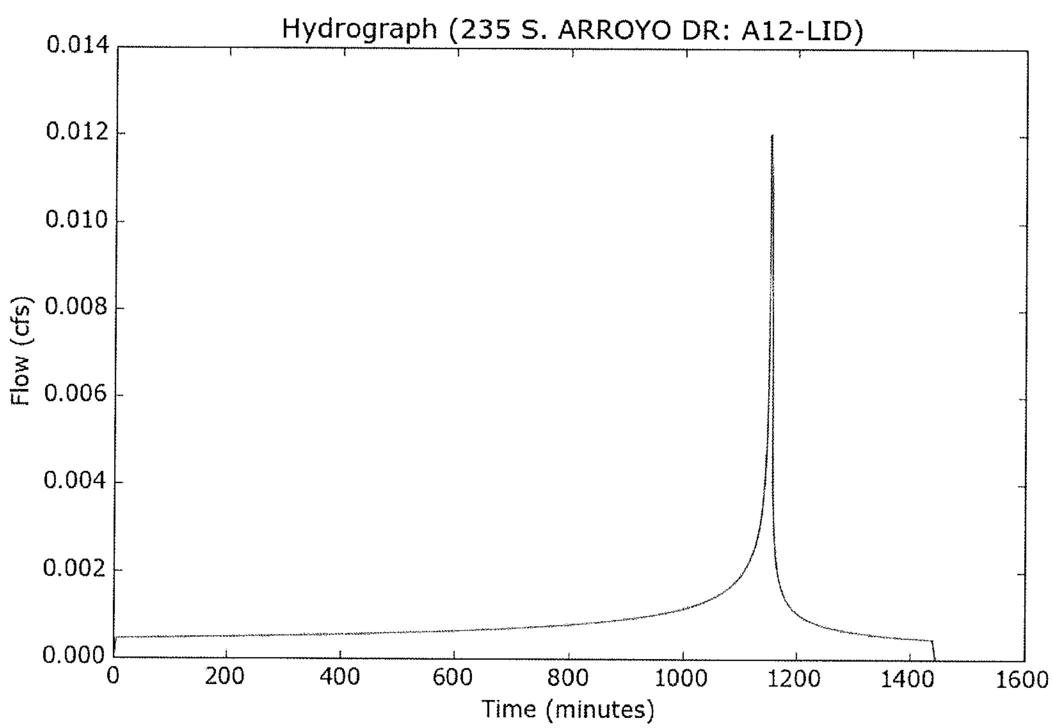
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A12-LID
Area (ac)	0.02
Flow Path Length (ft)	39.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.012
Burned Peak Flow Rate (cfs)	0.012
24-Hr Clear Runoff Volume (ac-ft)	0.0017
24-Hr Clear Runoff Volume (cu-ft)	72.576



Peak Flow Hydrologic Analysis

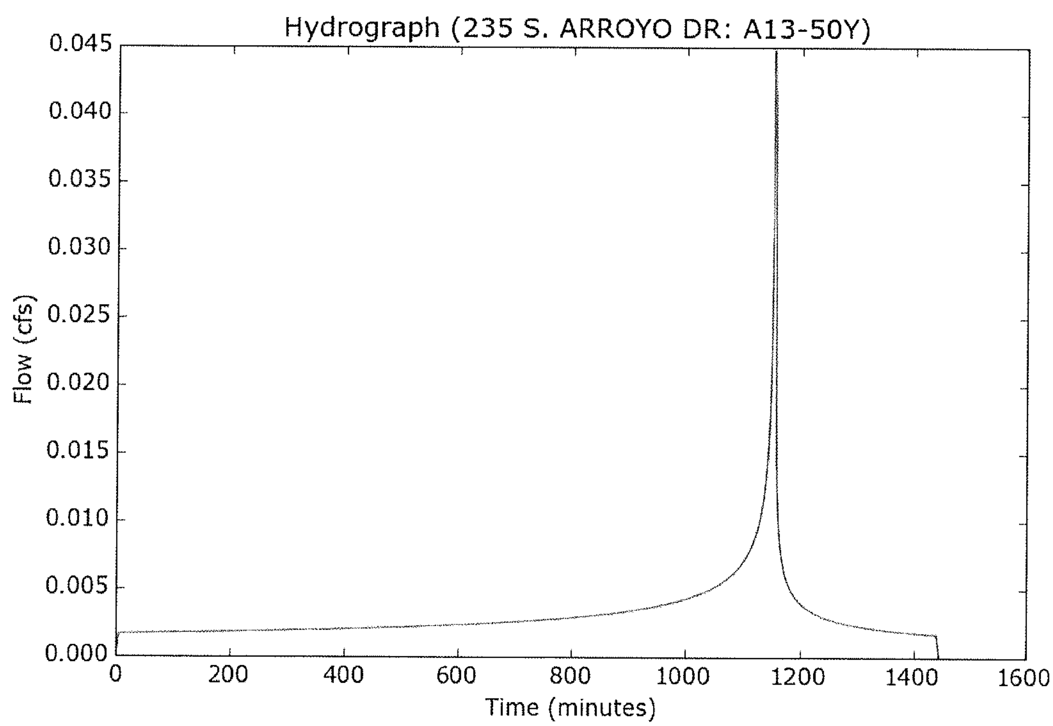
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A13-50Y
Area (ac)	0.012
Flow Path Length (ft)	24.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0448
Burned Peak Flow Rate (cfs)	0.0448
24-Hr Clear Runoff Volume (ac-ft)	0.0062
24-Hr Clear Runoff Volume (cu-ft)	270.2161



Peak Flow Hydrologic Analysis

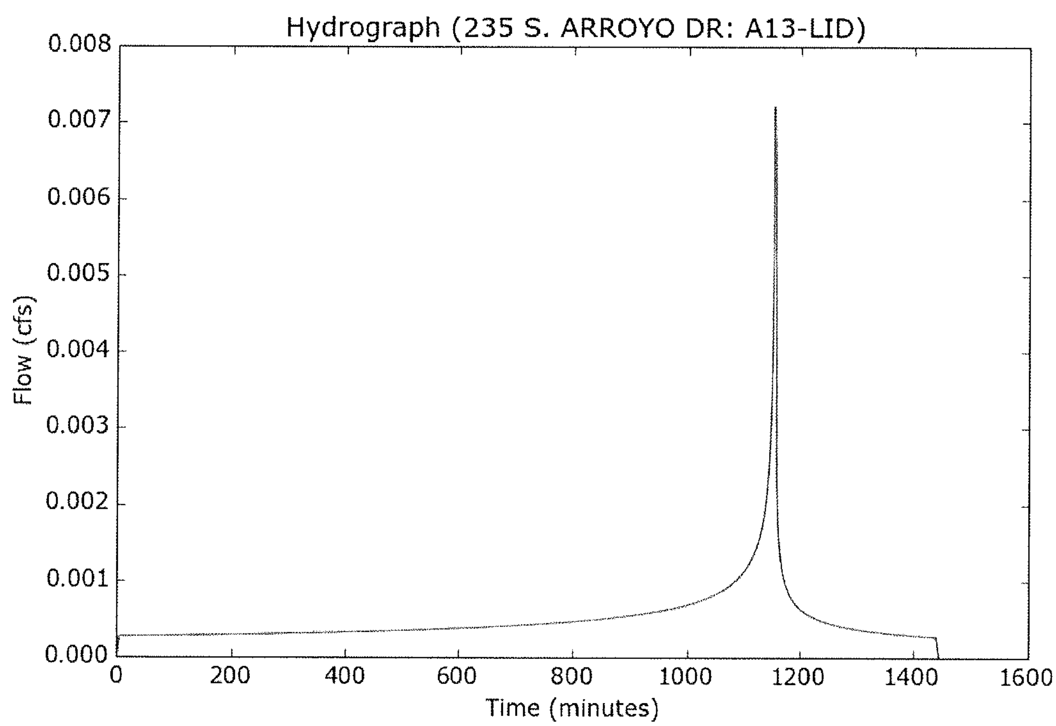
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A13-LID
Area (ac)	0.012
Flow Path Length (ft)	24.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0072
Burned Peak Flow Rate (cfs)	0.0072
24-Hr Clear Runoff Volume (ac-ft)	0.001
24-Hr Clear Runoff Volume (cu-ft)	43.5456



Peak Flow Hydrologic Analysis

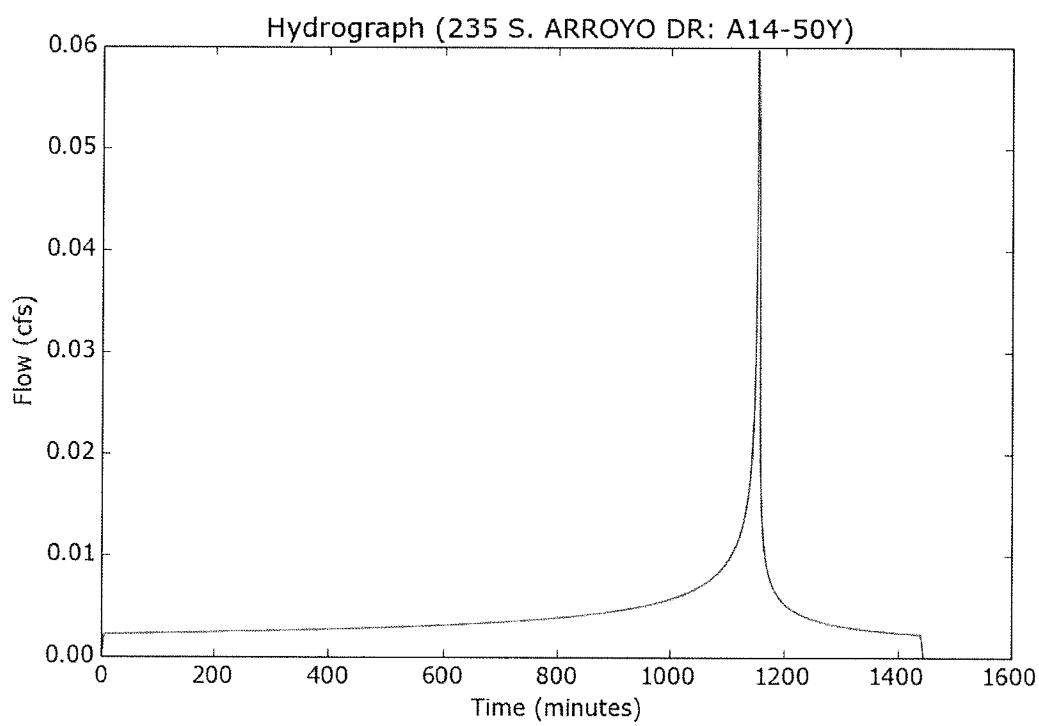
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A14-50Y
Area (ac)	0.016
Flow Path Length (ft)	31.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0597
Burned Peak Flow Rate (cfs)	0.0597
24-Hr Clear Runoff Volume (ac-ft)	0.0083
24-Hr Clear Runoff Volume (cu-ft)	360.2881



Peak Flow Hydrologic Analysis

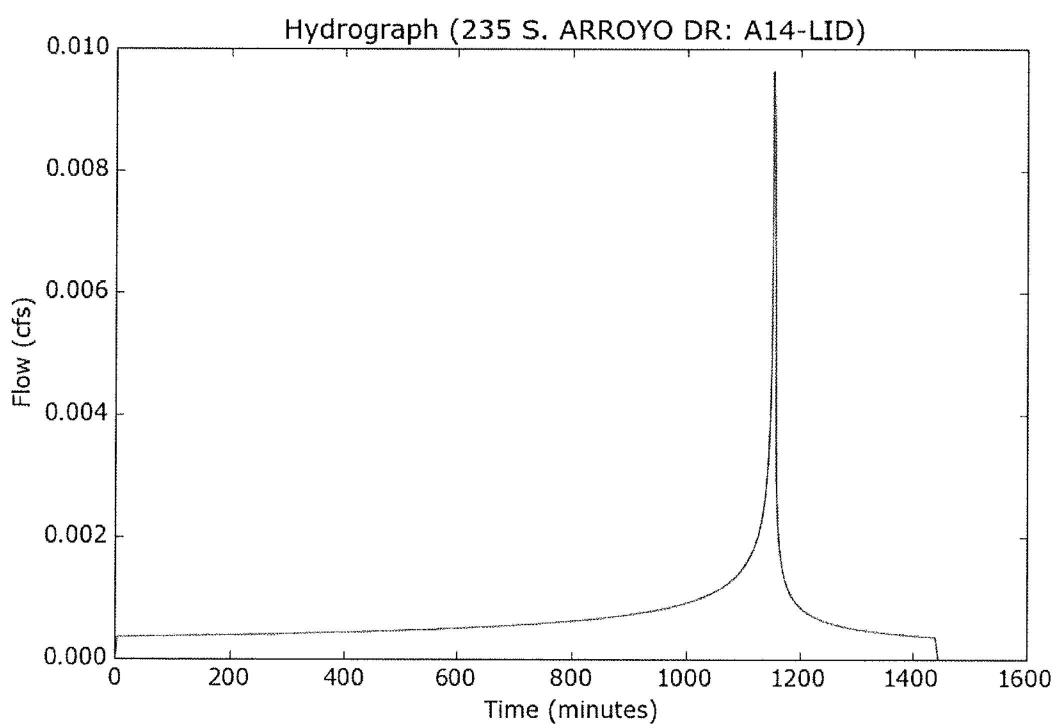
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A14-LID
Area (ac)	0.016
Flow Path Length (ft)	31.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0096
Burned Peak Flow Rate (cfs)	0.0096
24-Hr Clear Runoff Volume (ac-ft)	0.0013
24-Hr Clear Runoff Volume (cu-ft)	58.0608



Peak Flow Hydrologic Analysis

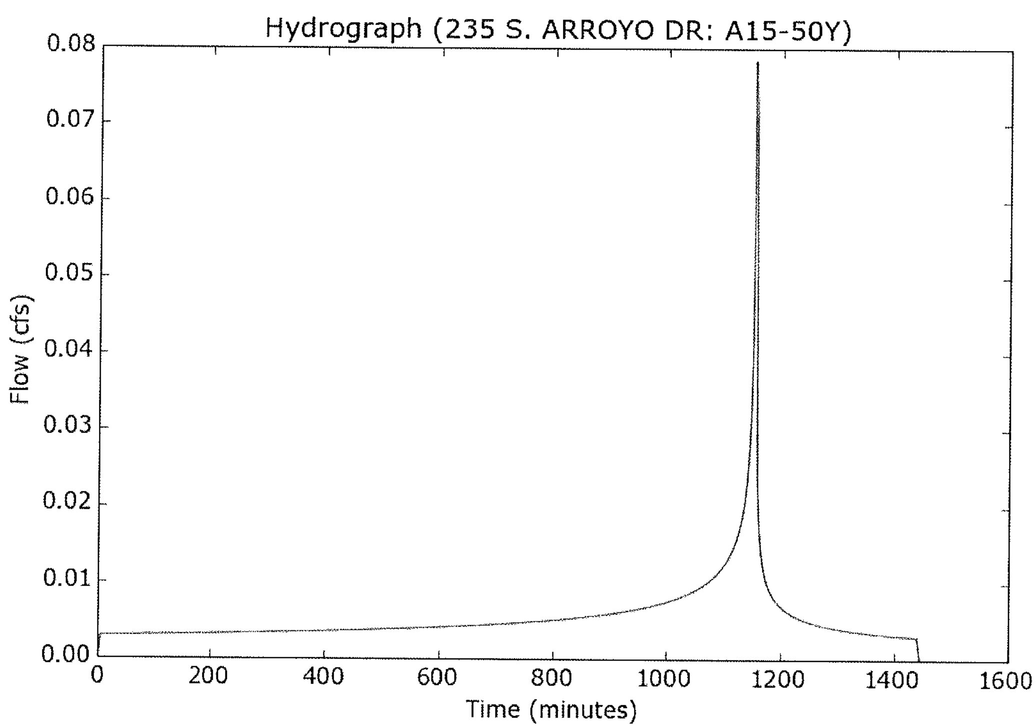
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A15-50Y
Area (ac)	0.021
Flow Path Length (ft)	48.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0784
Burned Peak Flow Rate (cfs)	0.0784
24-Hr Clear Runoff Volume (ac-ft)	0.0109
24-Hr Clear Runoff Volume (cu-ft)	472.8781



Peak Flow Hydrologic Analysis

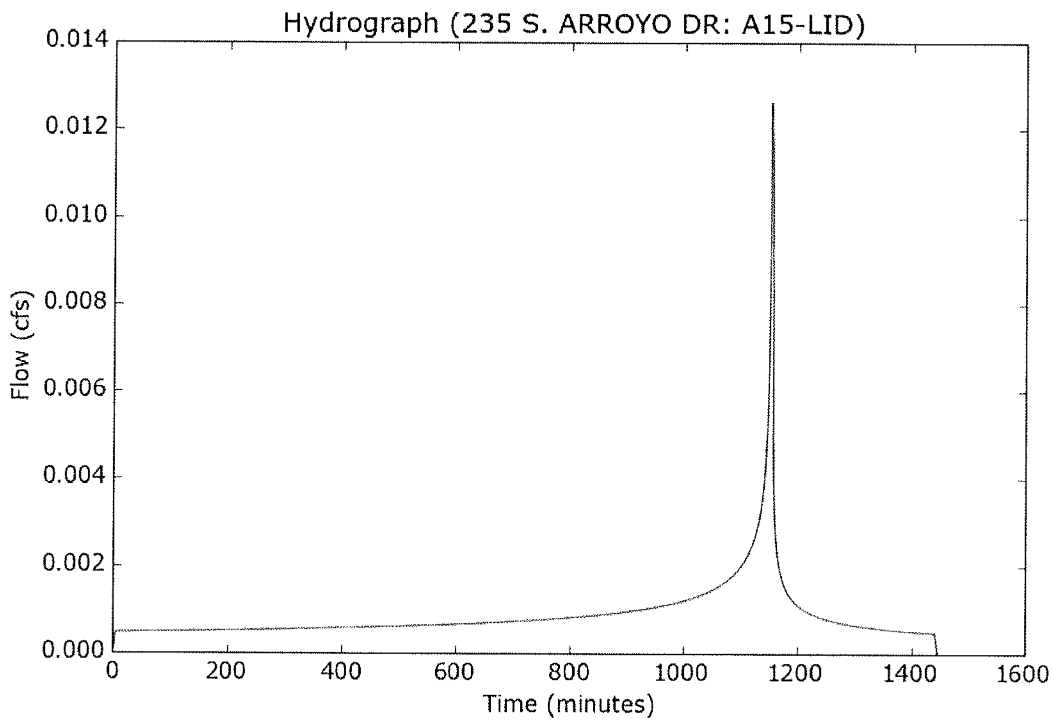
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A15-LID
Area (ac)	0.021
Flow Path Length (ft)	48.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0126
Burned Peak Flow Rate (cfs)	0.0126
24-Hr Clear Runoff Volume (ac-ft)	0.0017
24-Hr Clear Runoff Volume (cu-ft)	76.2048



Peak Flow Hydrologic Analysis

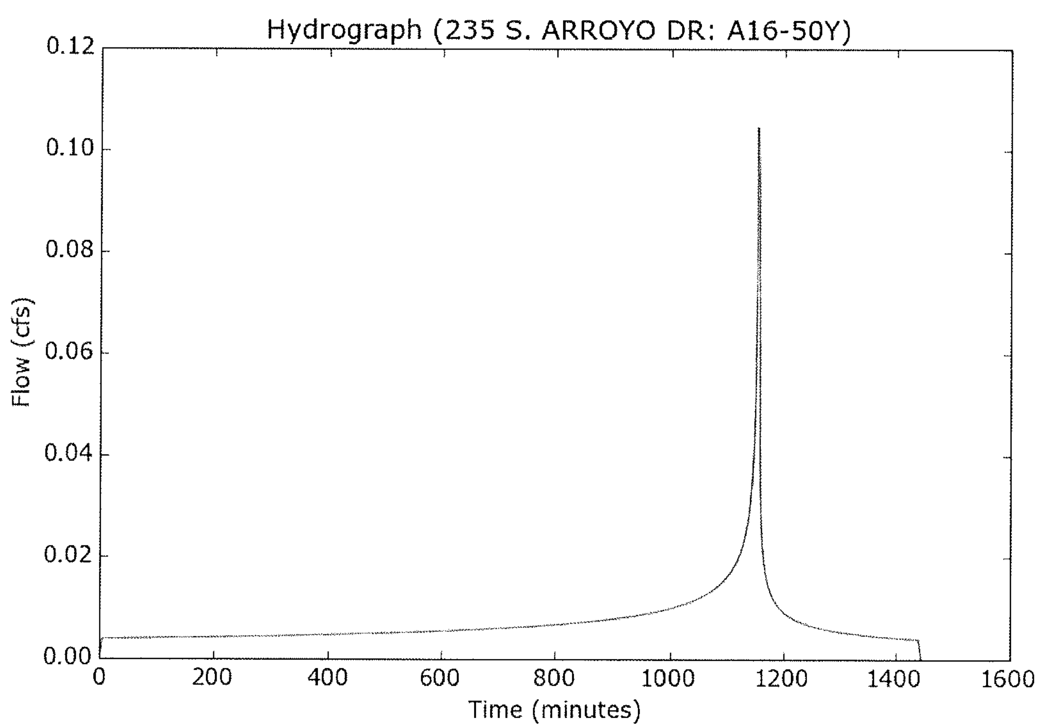
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A16-50Y
Area (ac)	0.028
Flow Path Length (ft)	52.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1045
Burned Peak Flow Rate (cfs)	0.1045
24-Hr Clear Runoff Volume (ac-ft)	0.0145
24-Hr Clear Runoff Volume (cu-ft)	630.5042



Peak Flow Hydrologic Analysis

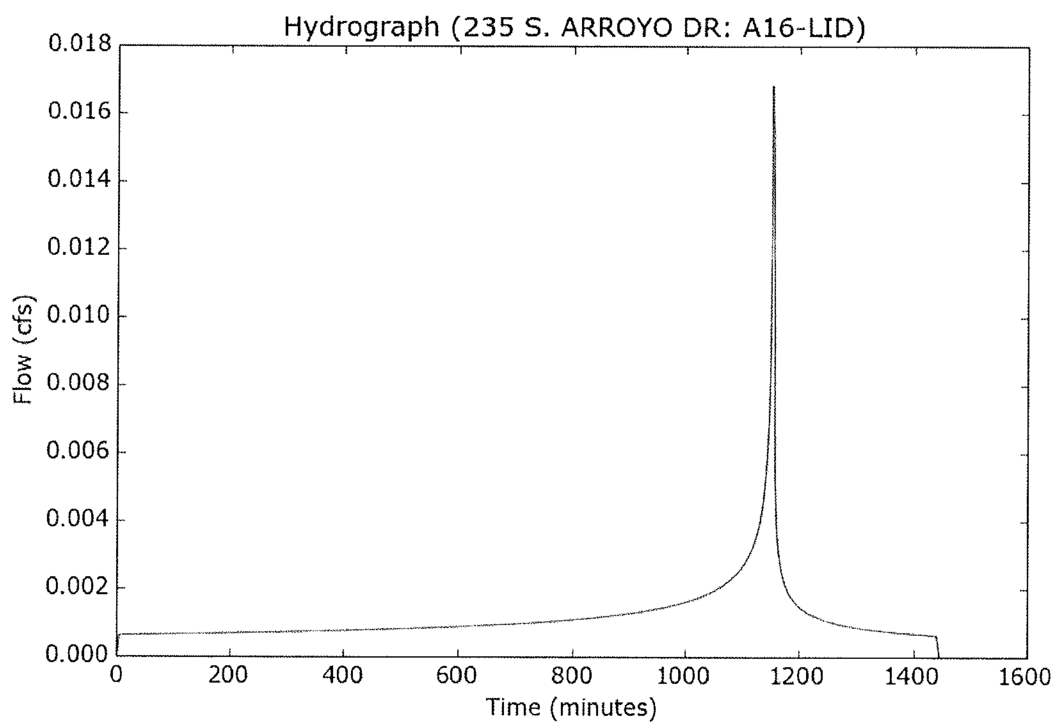
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A16-LID
Area (ac)	0.028
Flow Path Length (ft)	52.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0168
Burned Peak Flow Rate (cfs)	0.0168
24-Hr Clear Runoff Volume (ac-ft)	0.0023
24-Hr Clear Runoff Volume (cu-ft)	101.6064



Peak Flow Hydrologic Analysis

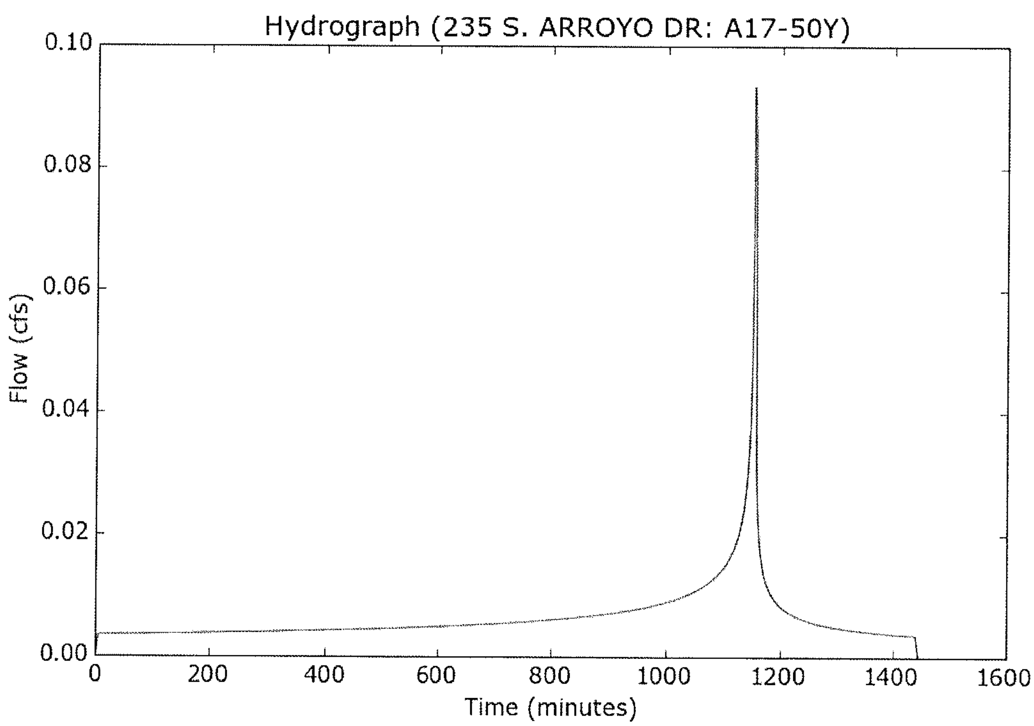
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A17-50Y
Area (ac)	0.025
Flow Path Length (ft)	20.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0933
Burned Peak Flow Rate (cfs)	0.0933
24-Hr Clear Runoff Volume (ac-ft)	0.0129
24-Hr Clear Runoff Volume (cu-ft)	562.9502



Peak Flow Hydrologic Analysis

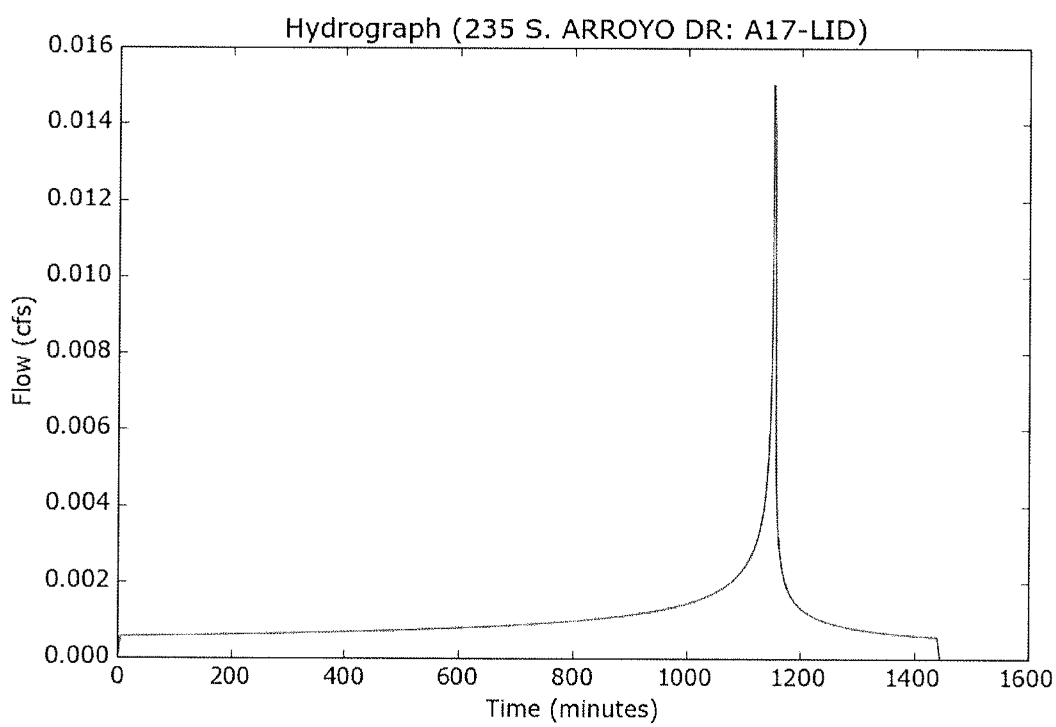
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A17-LID
Area (ac)	0.025
Flow Path Length (ft)	20.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.015
Burned Peak Flow Rate (cfs)	0.015
24-Hr Clear Runoff Volume (ac-ft)	0.0021
24-Hr Clear Runoff Volume (cu-ft)	90.72



Peak Flow Hydrologic Analysis

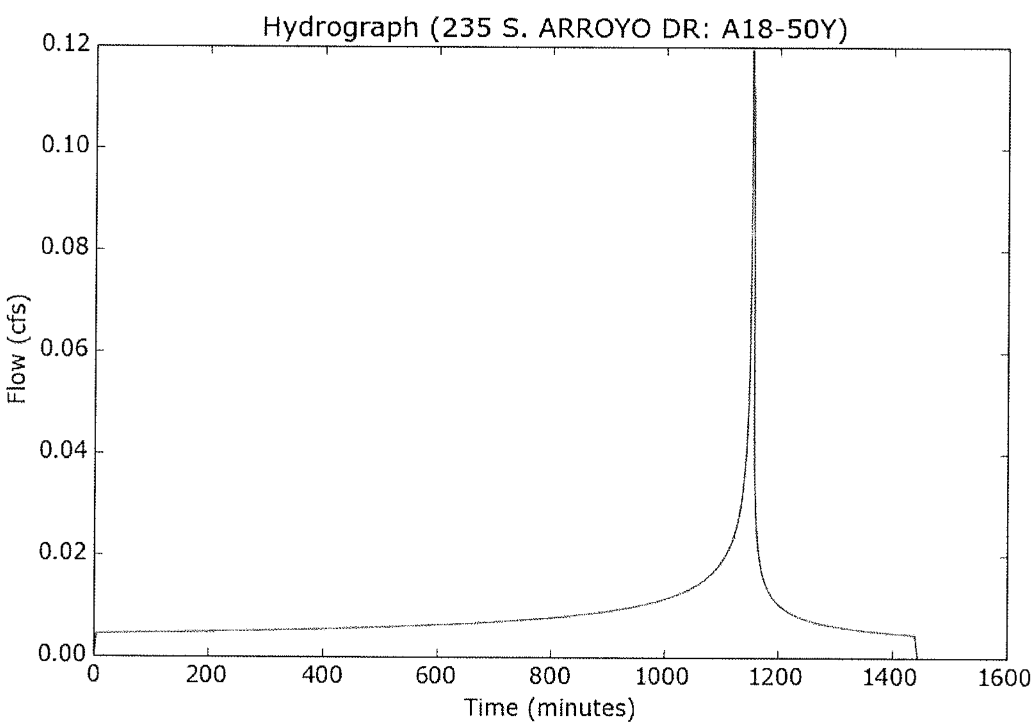
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A18-50Y
Area (ac)	0.032
Flow Path Length (ft)	30.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1194
Burned Peak Flow Rate (cfs)	0.1194
24-Hr Clear Runoff Volume (ac-ft)	0.0165
24-Hr Clear Runoff Volume (cu-ft)	720.5762



Peak Flow Hydrologic Analysis

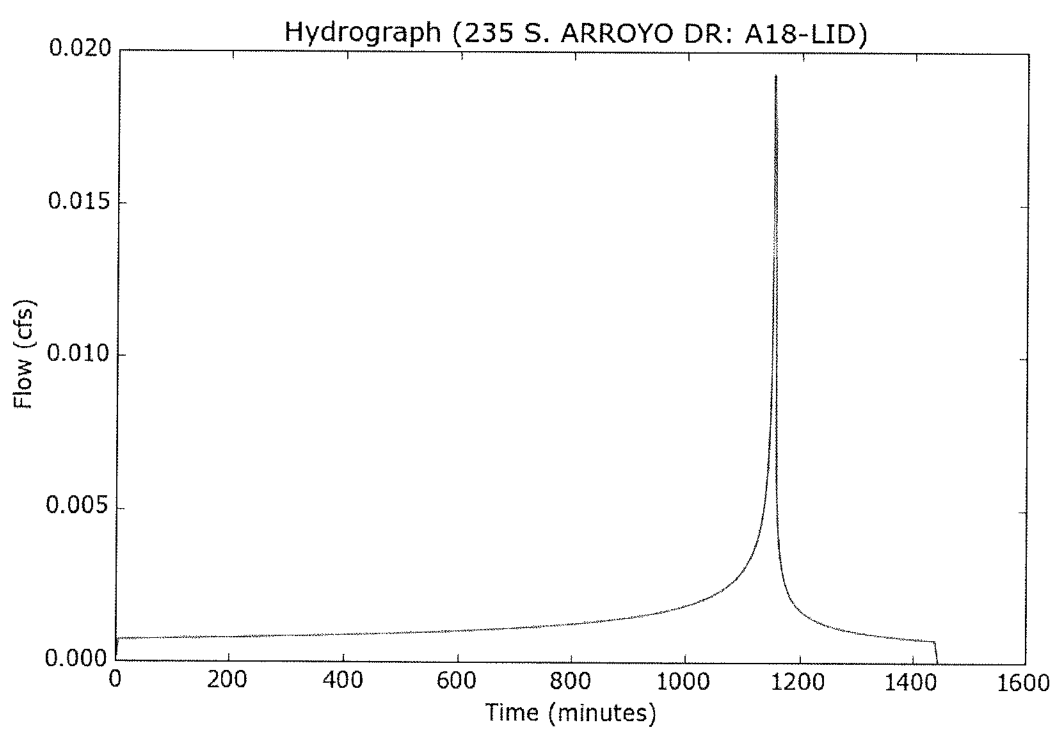
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A18-LID
Area (ac)	0.032
Flow Path Length (ft)	30.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0192
Burned Peak Flow Rate (cfs)	0.0192
24-Hr Clear Runoff Volume (ac-ft)	0.0027
24-Hr Clear Runoff Volume (cu-ft)	116.1216



Peak Flow Hydrologic Analysis

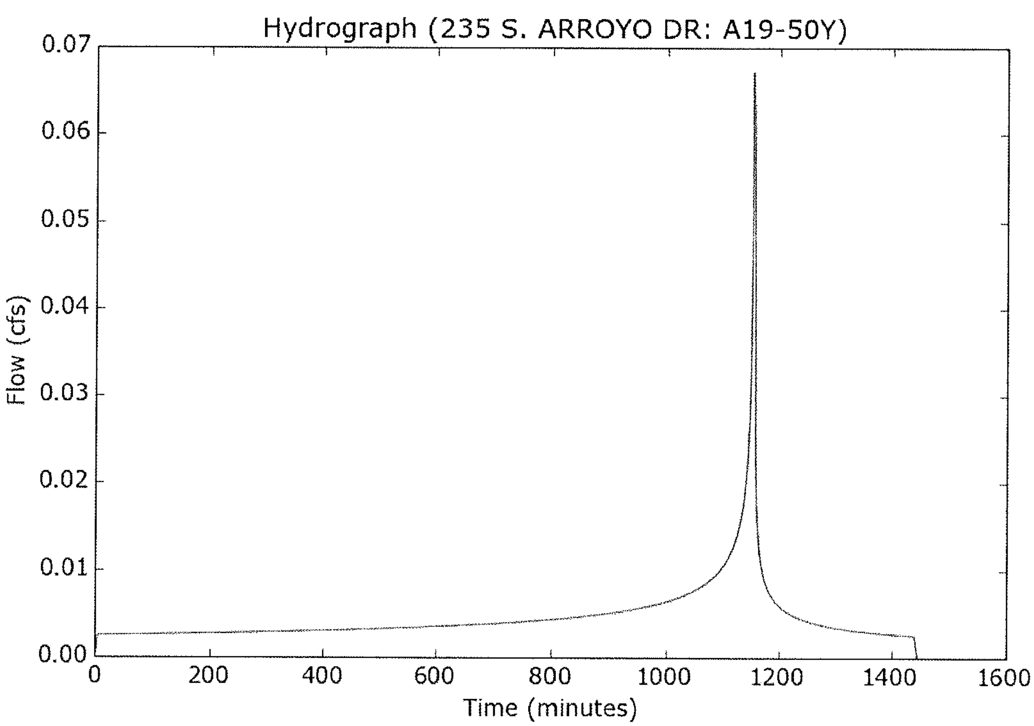
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A19-50Y
Area (ac)	0.018
Flow Path Length (ft)	23.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0672
Burned Peak Flow Rate (cfs)	0.0672
24-Hr Clear Runoff Volume (ac-ft)	0.0093
24-Hr Clear Runoff Volume (cu-ft)	405.3241



Peak Flow Hydrologic Analysis

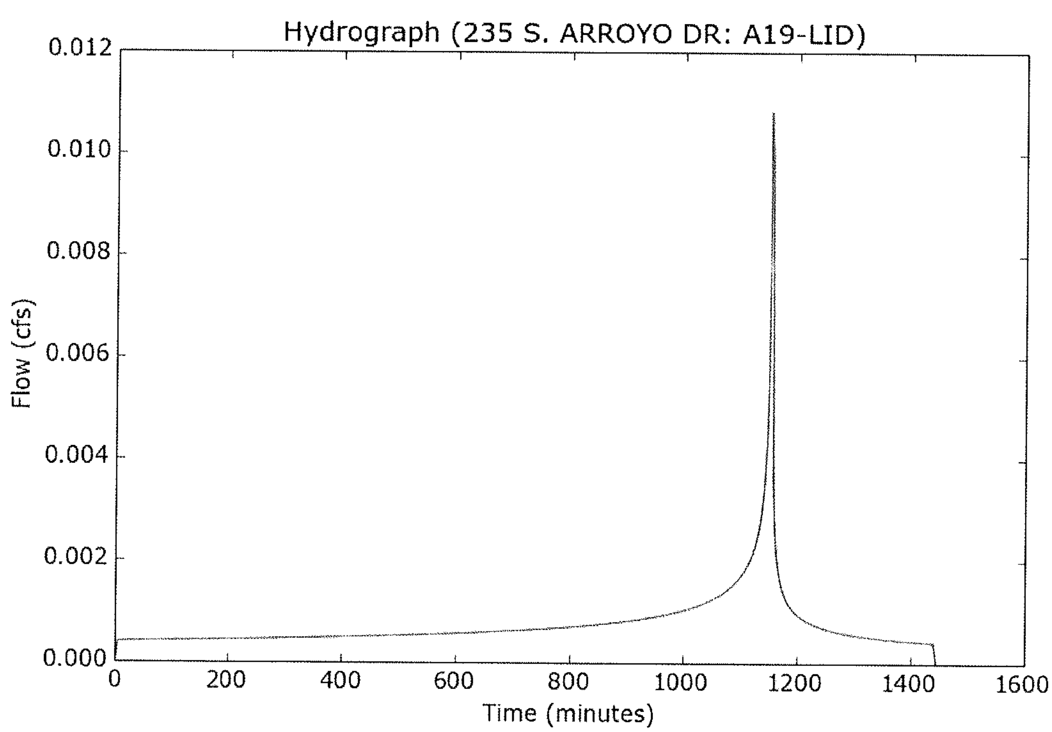
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A19-LID
Area (ac)	0.018
Flow Path Length (ft)	23.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0108
Burned Peak Flow Rate (cfs)	0.0108
24-Hr Clear Runoff Volume (ac-ft)	0.0015
24-Hr Clear Runoff Volume (cu-ft)	65.3184



Peak Flow Hydrologic Analysis

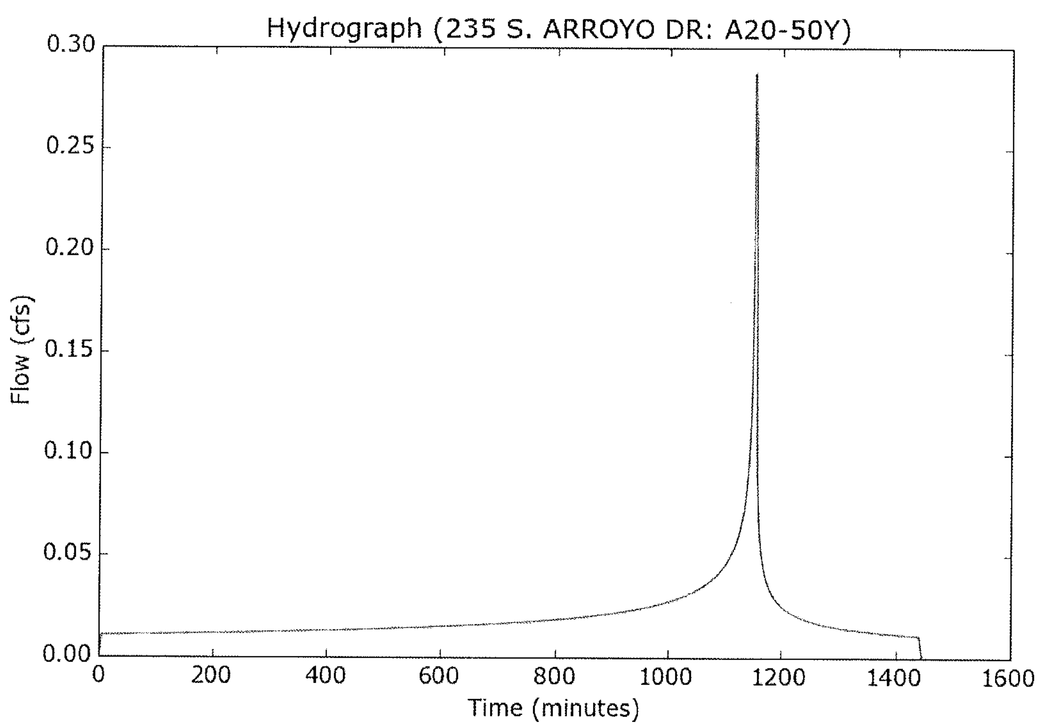
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A20-50Y
Area (ac)	0.077
Flow Path Length (ft)	63.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2874
Burned Peak Flow Rate (cfs)	0.2874
24-Hr Clear Runoff Volume (ac-ft)	0.0398
24-Hr Clear Runoff Volume (cu-ft)	1733.8865



Peak Flow Hydrologic Analysis

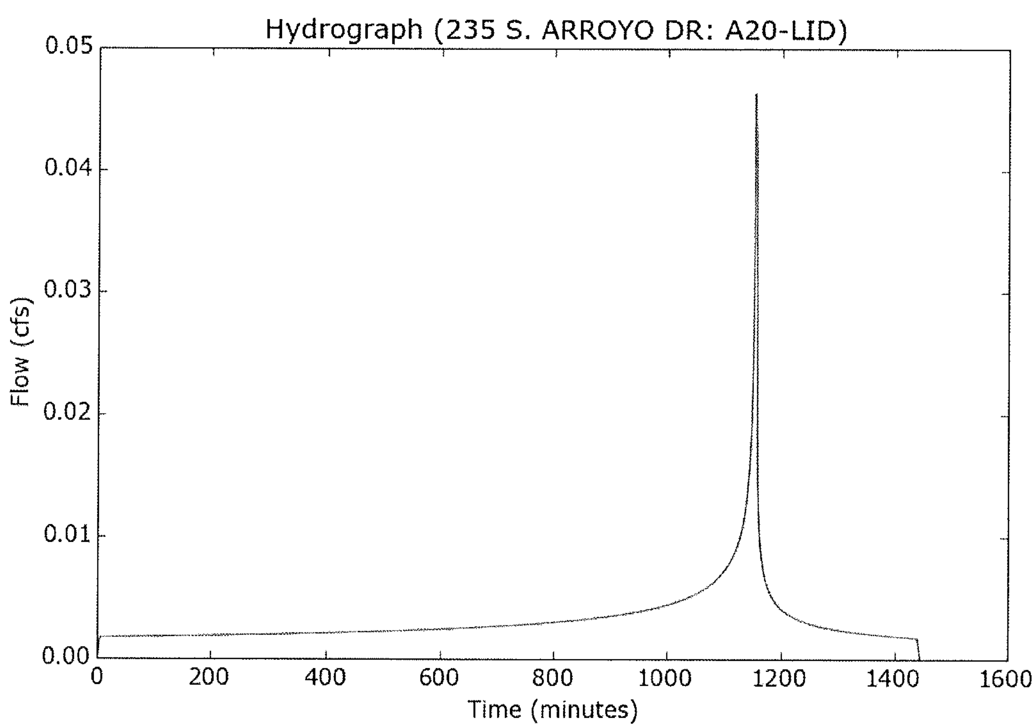
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A20-LID
Area (ac)	0.077
Flow Path Length (ft)	63.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0463
Burned Peak Flow Rate (cfs)	0.0463
24-Hr Clear Runoff Volume (ac-ft)	0.0064
24-Hr Clear Runoff Volume (cu-ft)	279.4177



Peak Flow Hydrologic Analysis

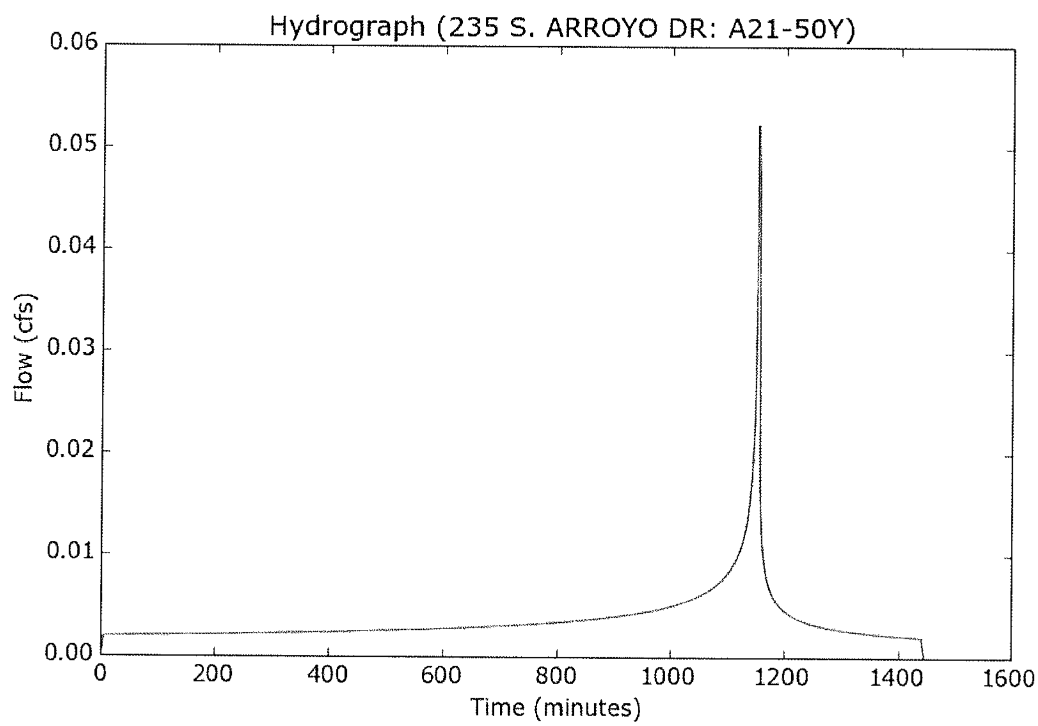
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A21-50Y
Area (ac)	0.014
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0522
Burned Peak Flow Rate (cfs)	0.0522
24-Hr Clear Runoff Volume (ac-ft)	0.0072
24-Hr Clear Runoff Volume (cu-ft)	315.2521



Peak Flow Hydrologic Analysis

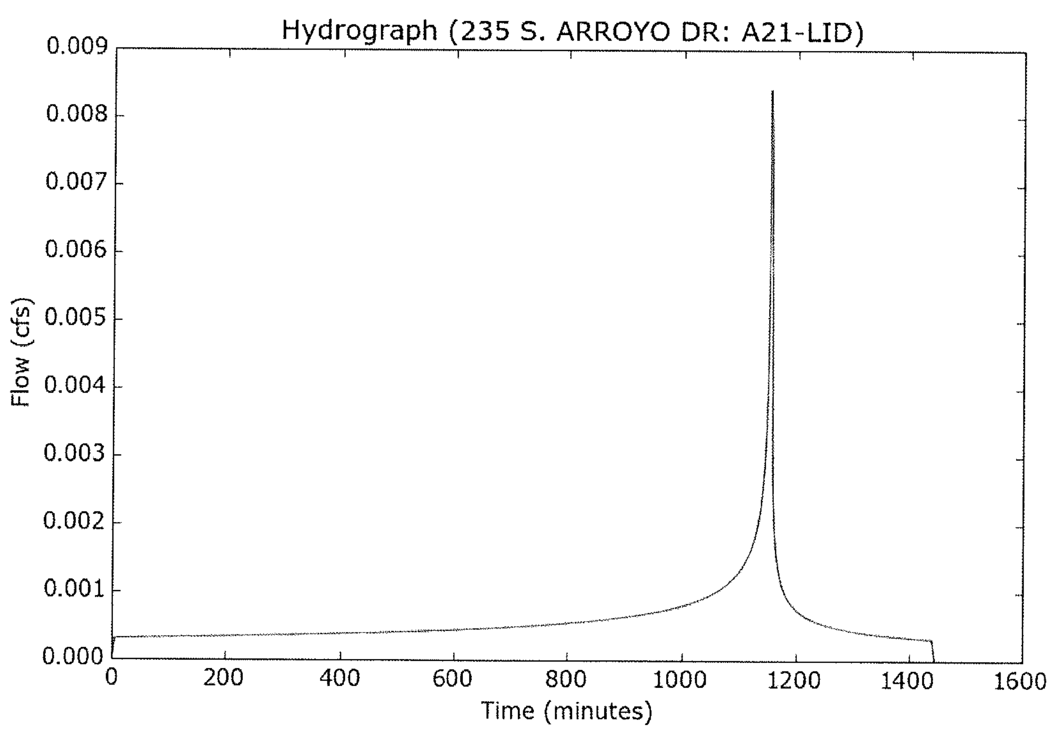
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A21-LID
Area (ac)	0.014
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0084
Burned Peak Flow Rate (cfs)	0.0084
24-Hr Clear Runoff Volume (ac-ft)	0.0012
24-Hr Clear Runoff Volume (cu-ft)	50.8032



Peak Flow Hydrologic Analysis

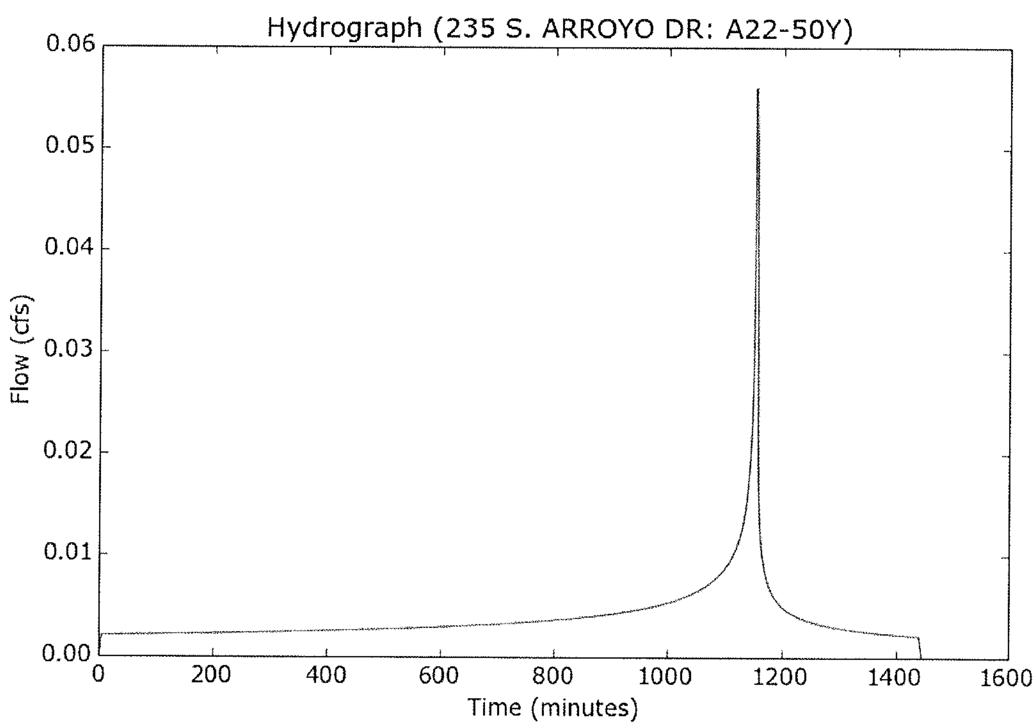
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A22-50Y
Area (ac)	0.015
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.056
Burned Peak Flow Rate (cfs)	0.056
24-Hr Clear Runoff Volume (ac-ft)	0.0078
24-Hr Clear Runoff Volume (cu-ft)	337.7701



Peak Flow Hydrologic Analysis

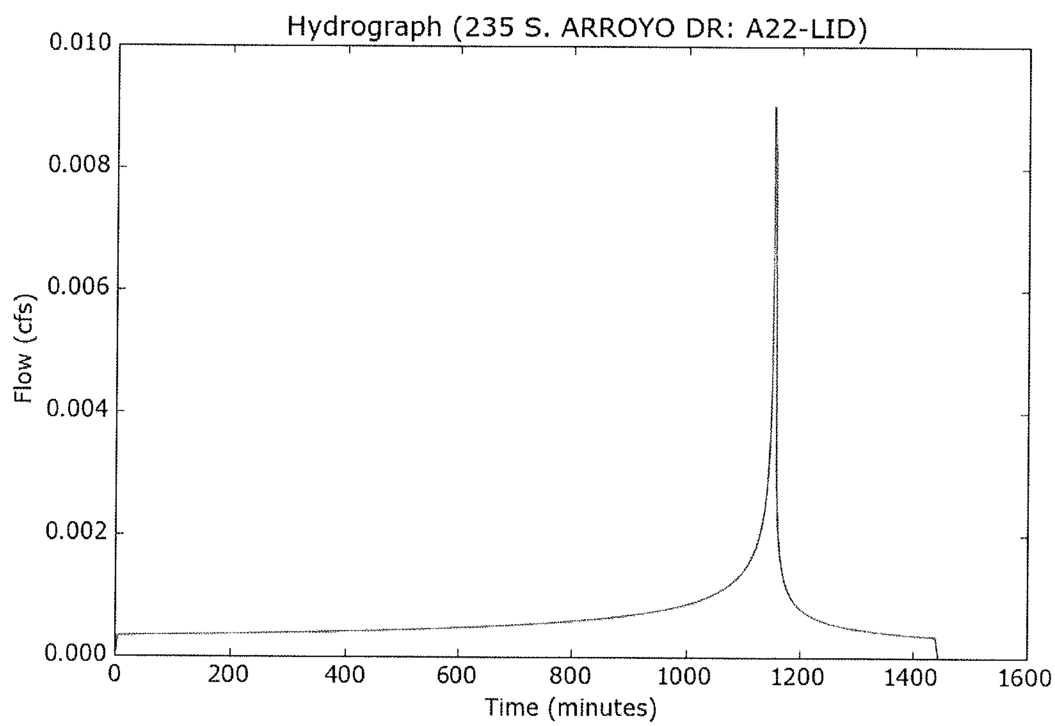
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A22-LID
Area (ac)	0.015
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.009
Burned Peak Flow Rate (cfs)	0.009
24-Hr Clear Runoff Volume (ac-ft)	0.0012
24-Hr Clear Runoff Volume (cu-ft)	54.432



Peak Flow Hydrologic Analysis

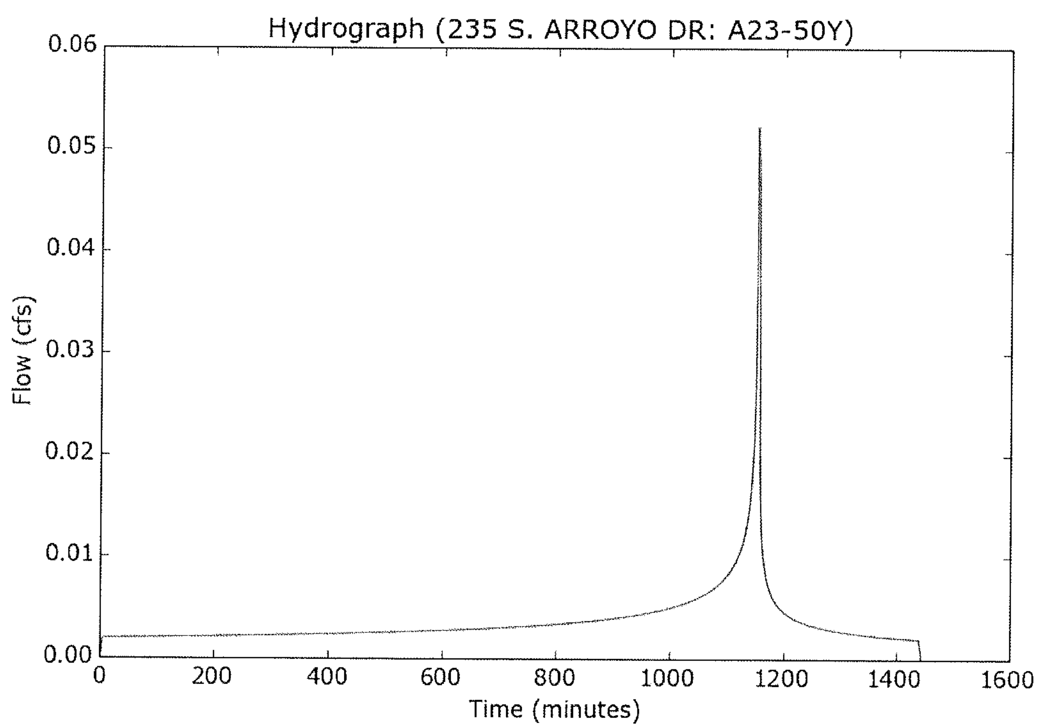
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A23-50Y
Area (ac)	0.014
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0522
Burned Peak Flow Rate (cfs)	0.0522
24-Hr Clear Runoff Volume (ac-ft)	0.0072
24-Hr Clear Runoff Volume (cu-ft)	315.2521



Peak Flow Hydrologic Analysis

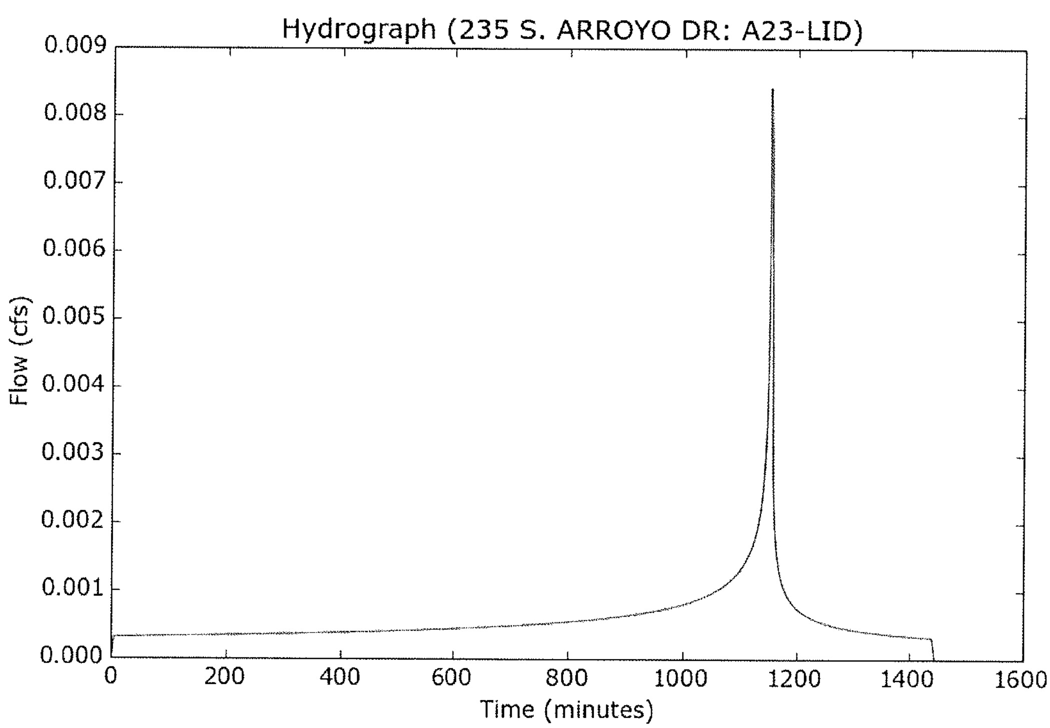
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A23-LID
Area (ac)	0.014
Flow Path Length (ft)	41.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0084
Burned Peak Flow Rate (cfs)	0.0084
24-Hr Clear Runoff Volume (ac-ft)	0.0012
24-Hr Clear Runoff Volume (cu-ft)	50.8032



Peak Flow Hydrologic Analysis

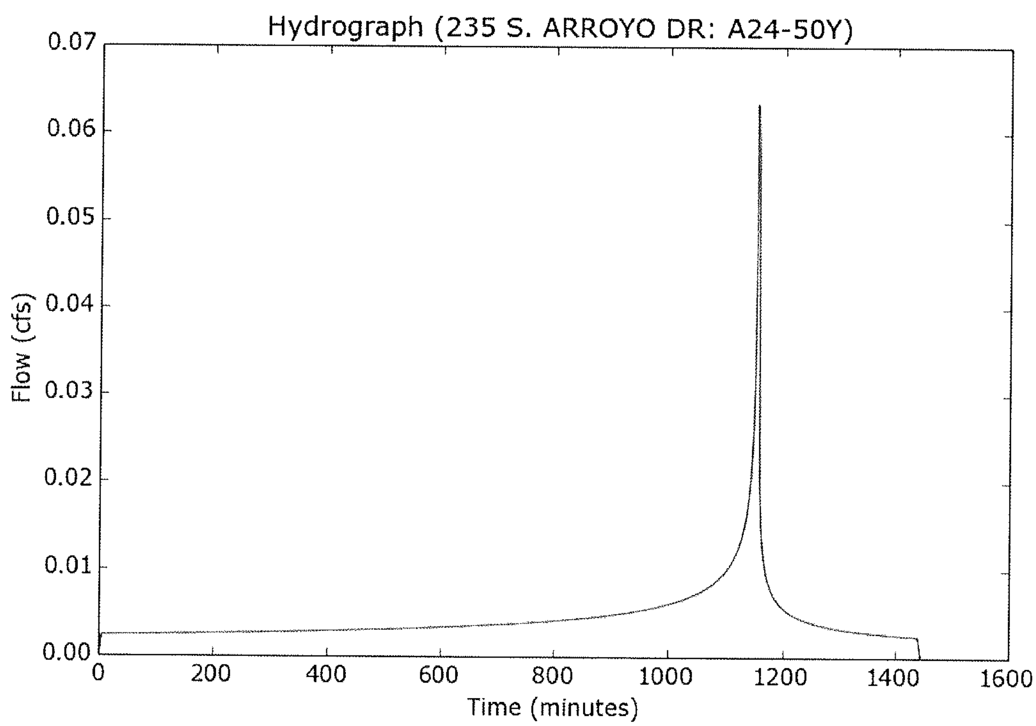
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A24-50Y
Area (ac)	0.017
Flow Path Length (ft)	44.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0634
Burned Peak Flow Rate (cfs)	0.0634
24-Hr Clear Runoff Volume (ac-ft)	0.0088
24-Hr Clear Runoff Volume (cu-ft)	382.8061



Peak Flow Hydrologic Analysis

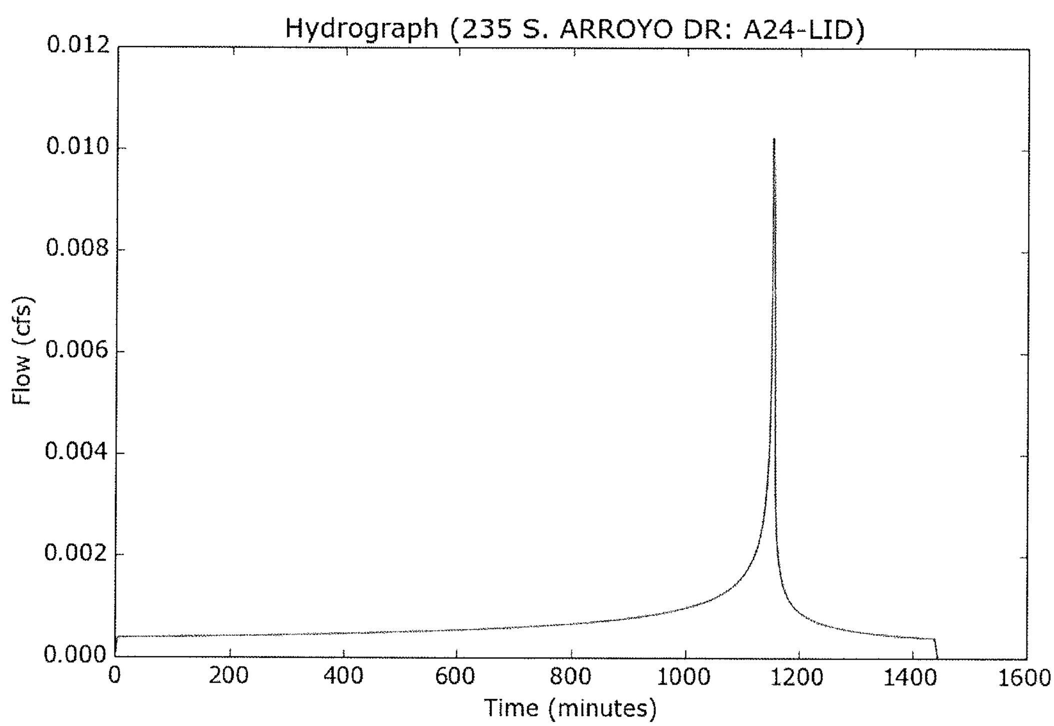
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A24-LID
Area (ac)	0.017
Flow Path Length (ft)	44.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0102
Burned Peak Flow Rate (cfs)	0.0102
24-Hr Clear Runoff Volume (ac-ft)	0.0014
24-Hr Clear Runoff Volume (cu-ft)	61.6896



Peak Flow Hydrologic Analysis

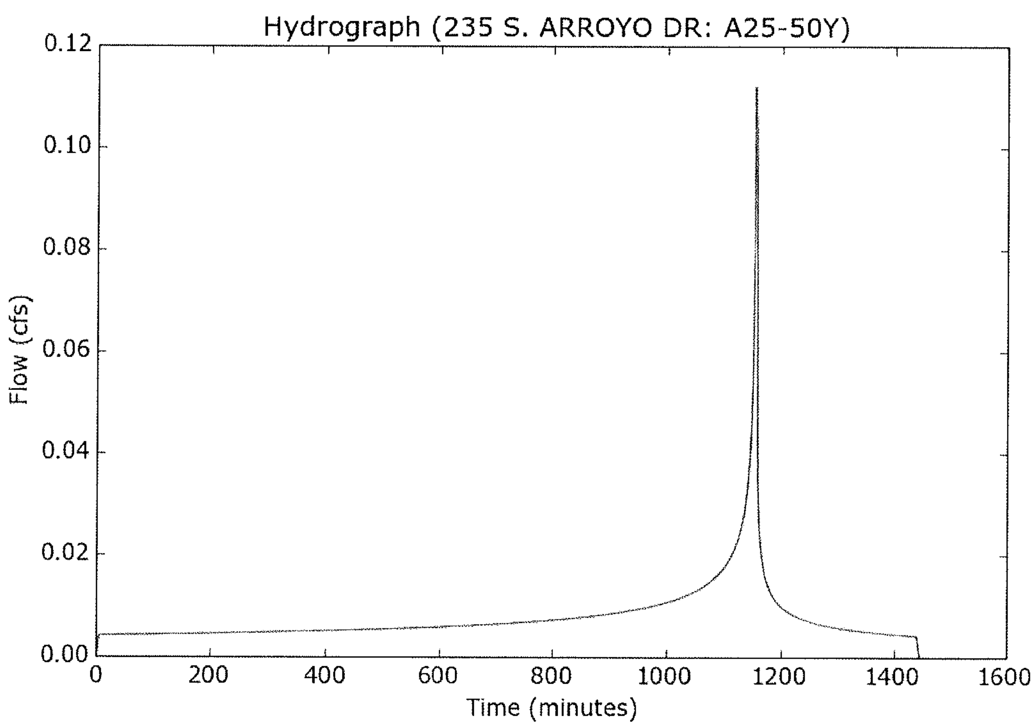
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A25-50Y
Area (ac)	0.03
Flow Path Length (ft)	35.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.112
Burned Peak Flow Rate (cfs)	0.112
24-Hr Clear Runoff Volume (ac-ft)	0.0155
24-Hr Clear Runoff Volume (cu-ft)	675.5402



Peak Flow Hydrologic Analysis

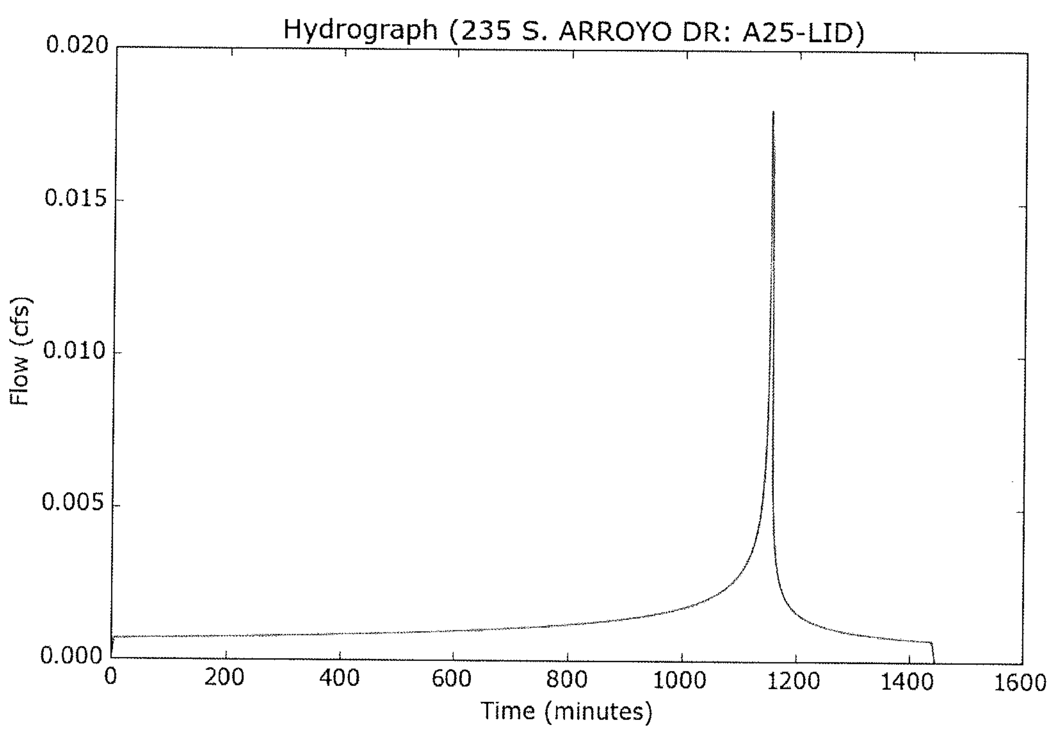
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A25-LID
Area (ac)	0.03
Flow Path Length (ft)	35.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.018
Burned Peak Flow Rate (cfs)	0.018
24-Hr Clear Runoff Volume (ac-ft)	0.0025
24-Hr Clear Runoff Volume (cu-ft)	108.864



Peak Flow Hydrologic Analysis

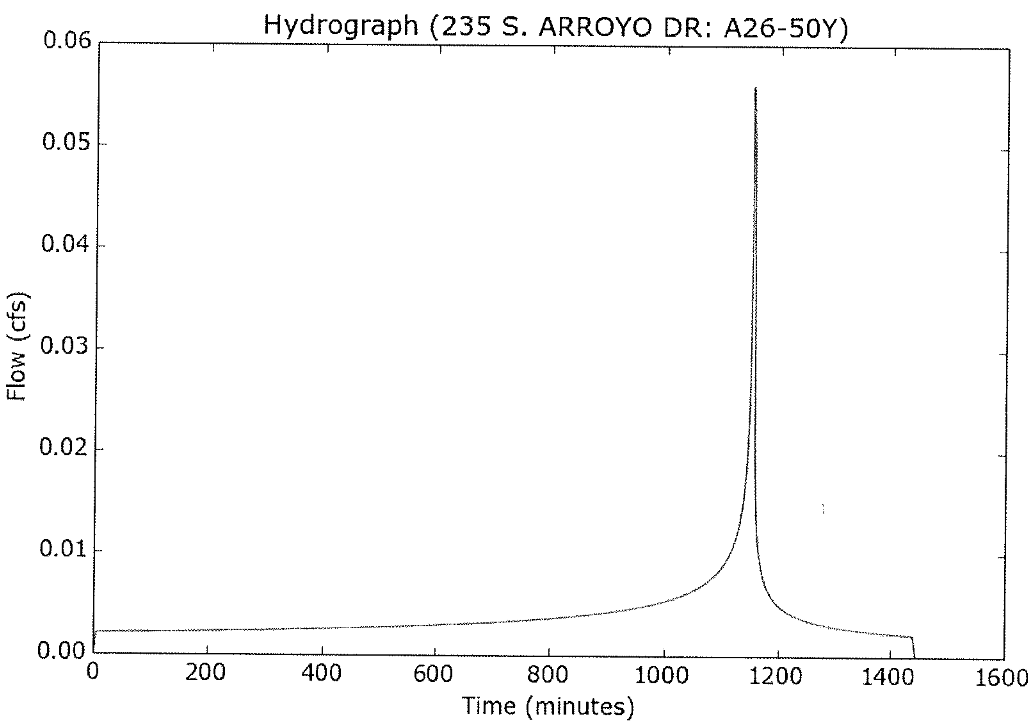
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A26-50Y
Area (ac)	0.015
Flow Path Length (ft)	26.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.056
Burned Peak Flow Rate (cfs)	0.056
24-Hr Clear Runoff Volume (ac-ft)	0.0078
24-Hr Clear Runoff Volume (cu-ft)	337.7701



Peak Flow Hydrologic Analysis

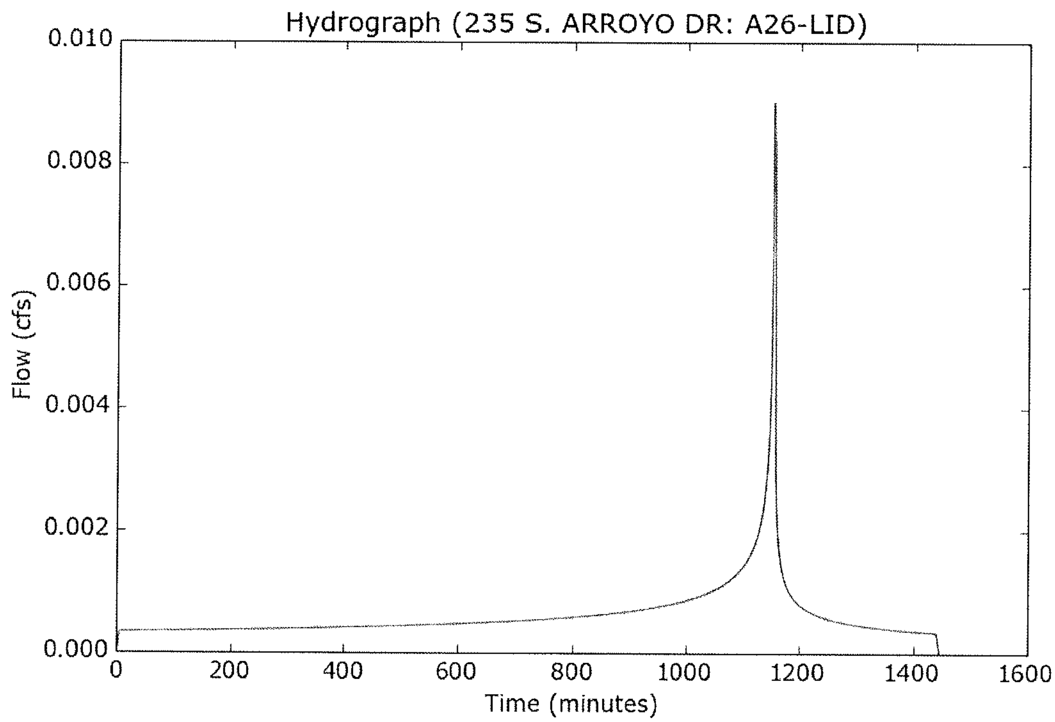
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A26-LID
Area (ac)	0.015
Flow Path Length (ft)	26.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.009
Burned Peak Flow Rate (cfs)	0.009
24-Hr Clear Runoff Volume (ac-ft)	0.0012
24-Hr Clear Runoff Volume (cu-ft)	54.432



Peak Flow Hydrologic Analysis

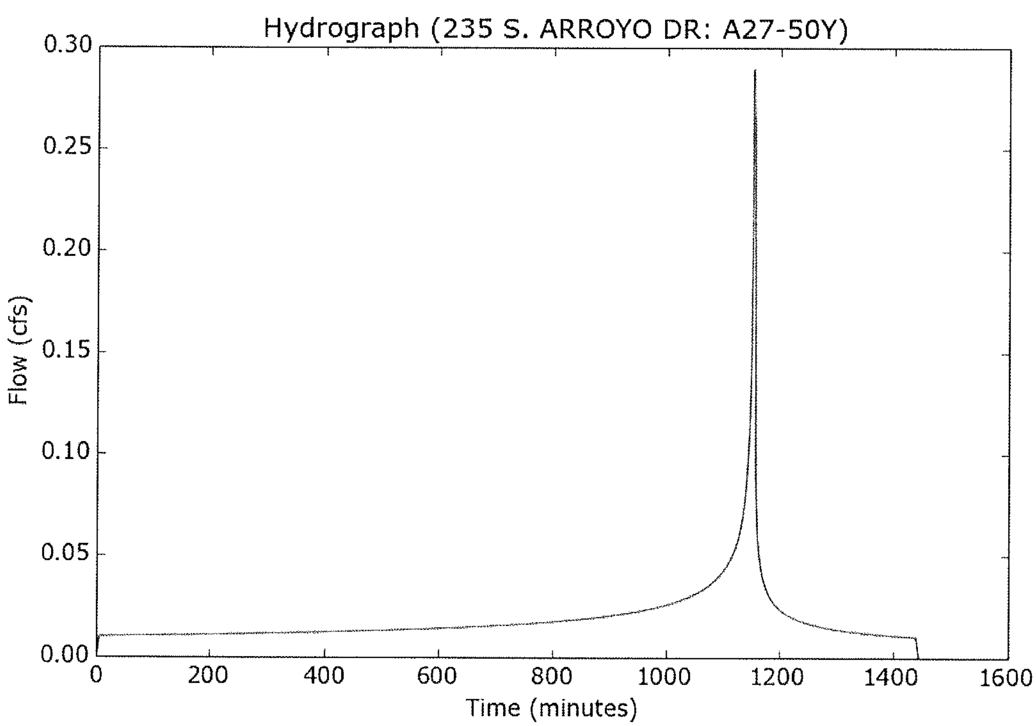
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A27-50Y
Area (ac)	0.078
Flow Path Length (ft)	83.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.95
Percent Impervious	0.92
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.8932
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2889
Burned Peak Flow Rate (cfs)	0.2889
24-Hr Clear Runoff Volume (ac-ft)	0.0377
24-Hr Clear Runoff Volume (cu-ft)	1641.0094



Peak Flow Hydrologic Analysis

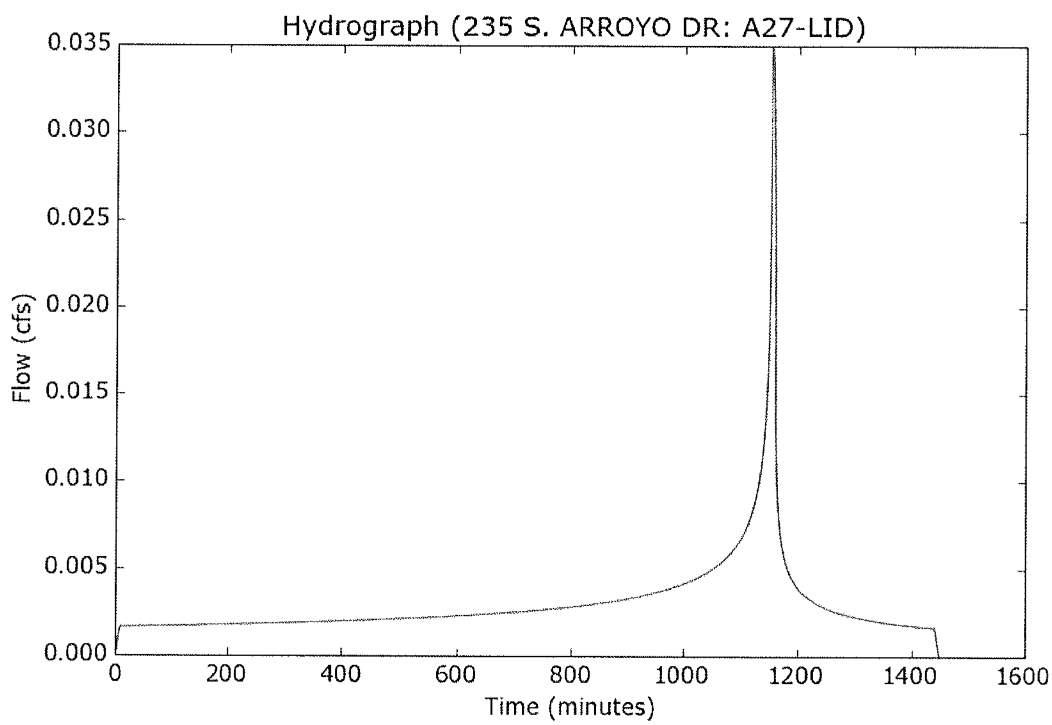
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A27-LID
Area (ac)	0.078
Flow Path Length (ft)	83.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	0.92
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.5358
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.836
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.0349
Burned Peak Flow Rate (cfs)	0.0349
24-Hr Clear Runoff Volume (ac-ft)	0.006
24-Hr Clear Runoff Volume (cu-ft)	262.9189



Peak Flow Hydrologic Analysis

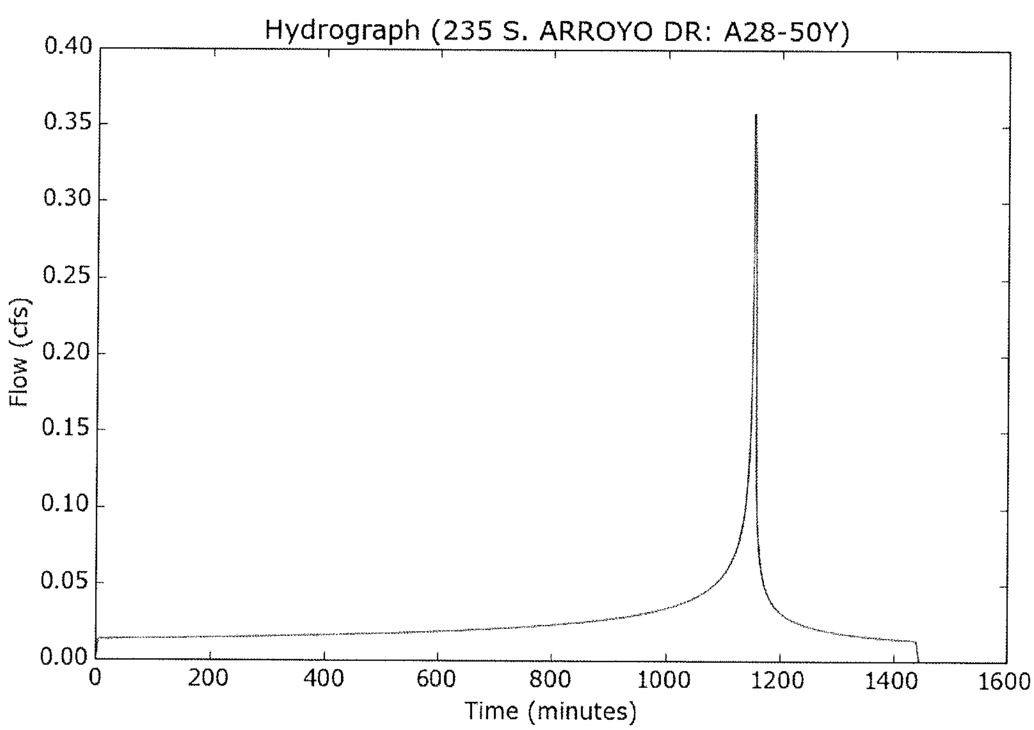
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A28-50Y
Area (ac)	0.096
Flow Path Length (ft)	47.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3583
Burned Peak Flow Rate (cfs)	0.3583
24-Hr Clear Runoff Volume (ac-ft)	0.0496
24-Hr Clear Runoff Volume (cu-ft)	2161.7287



Peak Flow Hydrologic Analysis

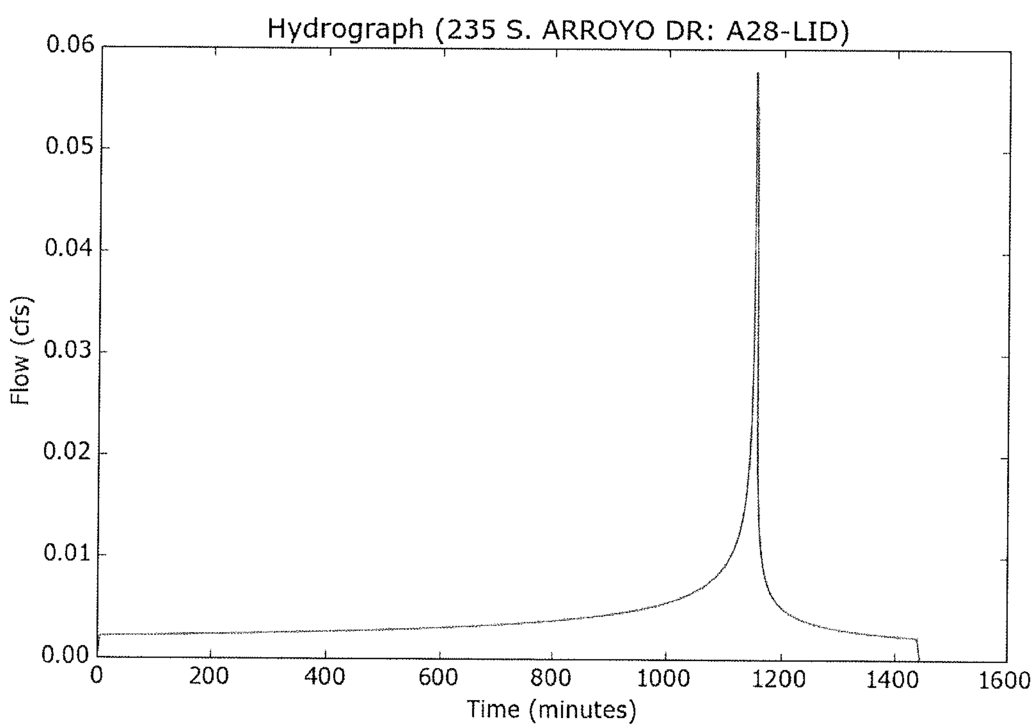
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A28-LID
Area (ac)	0.096
Flow Path Length (ft)	47.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0577
Burned Peak Flow Rate (cfs)	0.0577
24-Hr Clear Runoff Volume (ac-ft)	0.008
24-Hr Clear Runoff Volume (cu-ft)	348.3649



Peak Flow Hydrologic Analysis

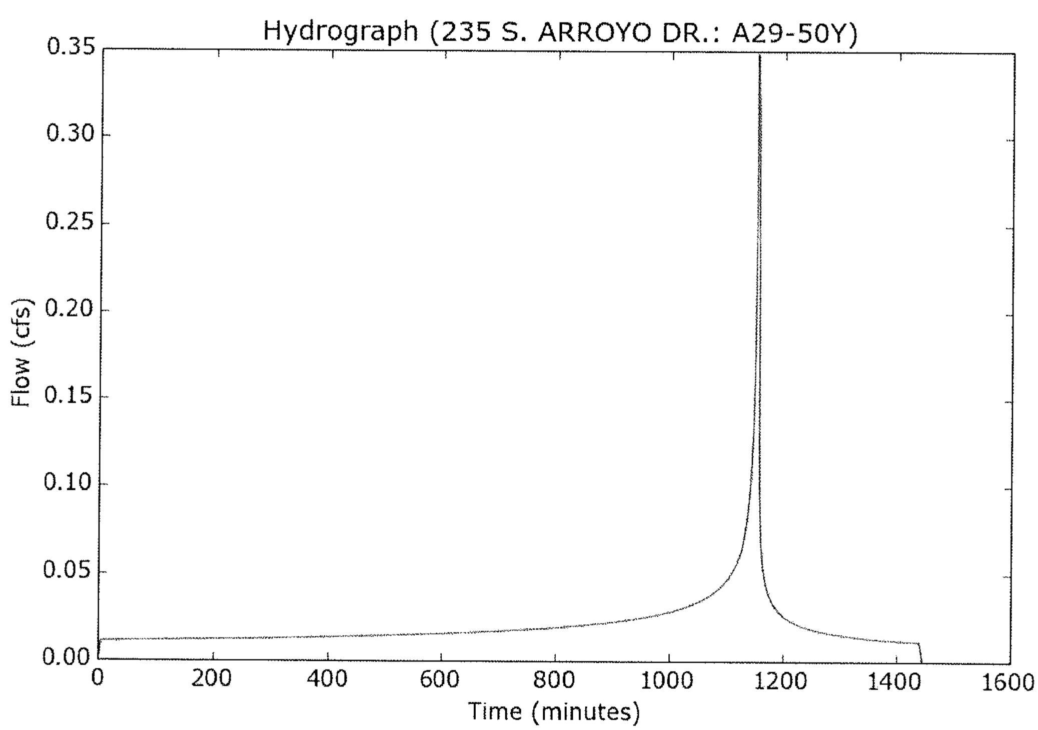
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR.
Subarea ID	A29-50Y
Area (ac)	0.095
Flow Path Length (ft)	147.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.95
Percent Impervious	0.81
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.8839
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3482
Burned Peak Flow Rate (cfs)	0.3482
24-Hr Clear Runoff Volume (ac-ft)	0.0414
24-Hr Clear Runoff Volume (cu-ft)	1805.4153



Peak Flow Hydrologic Analysis

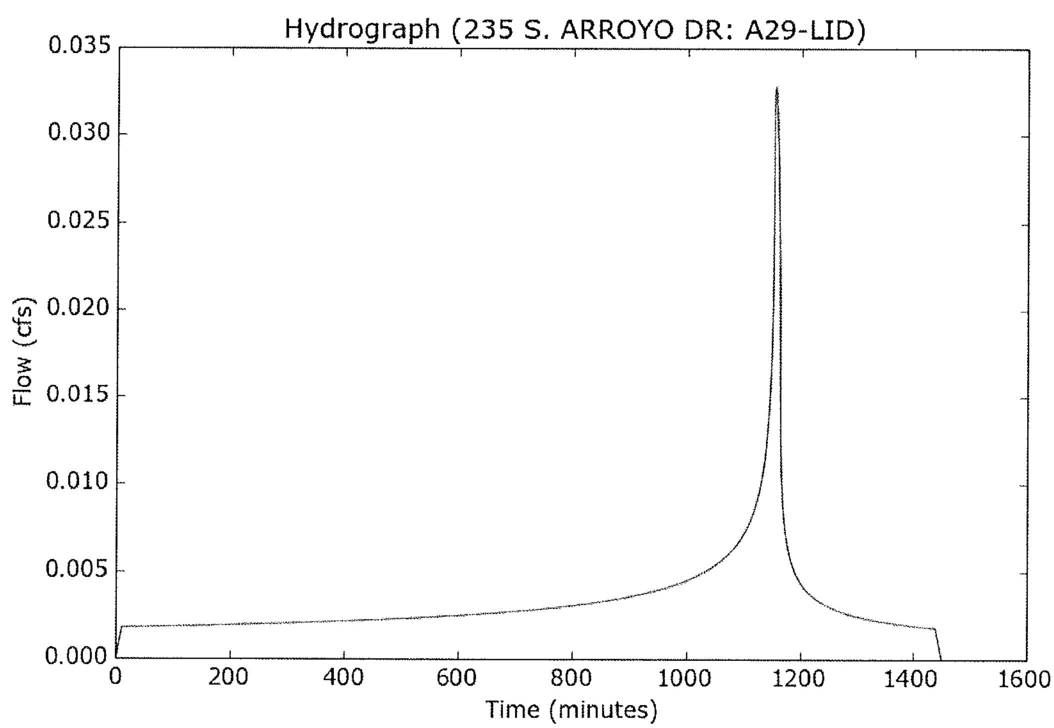
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A29-LID
Area (ac)	0.095
Flow Path Length (ft)	147.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	0.81
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.4613
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.748
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.0328
Burned Peak Flow Rate (cfs)	0.0328
24-Hr Clear Runoff Volume (ac-ft)	0.0066
24-Hr Clear Runoff Volume (cu-ft)	286.5144



Peak Flow Hydrologic Analysis

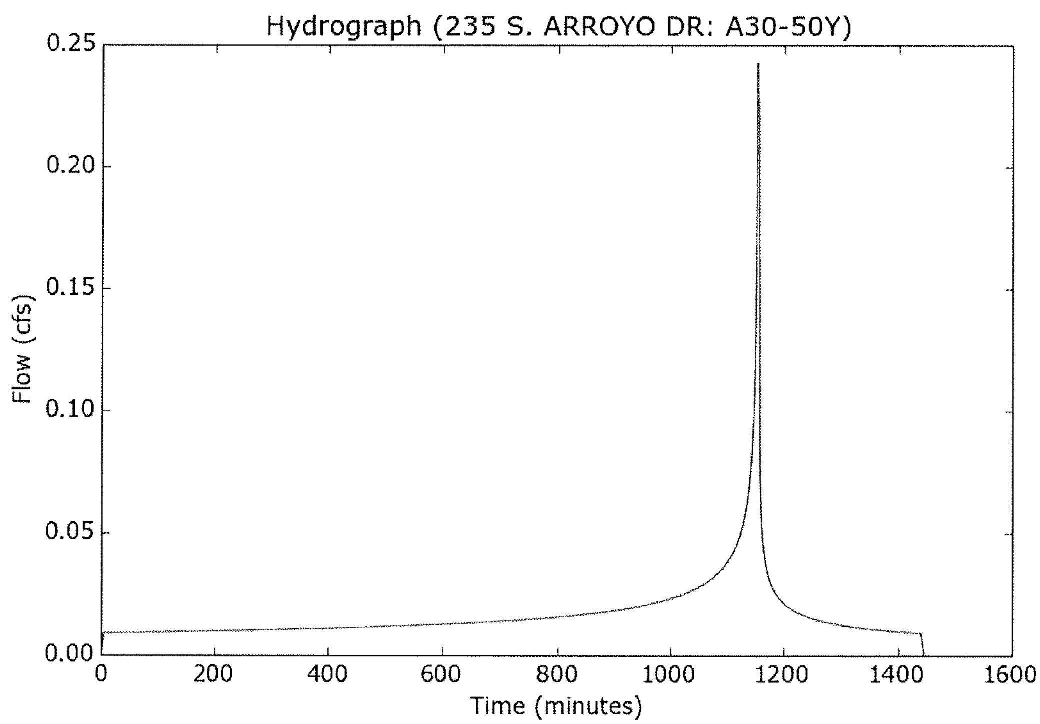
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A30-50Y
Area (ac)	0.065
Flow Path Length (ft)	140.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2426
Burned Peak Flow Rate (cfs)	0.2426
24-Hr Clear Runoff Volume (ac-ft)	0.0336
24-Hr Clear Runoff Volume (cu-ft)	1463.6705



Peak Flow Hydrologic Analysis

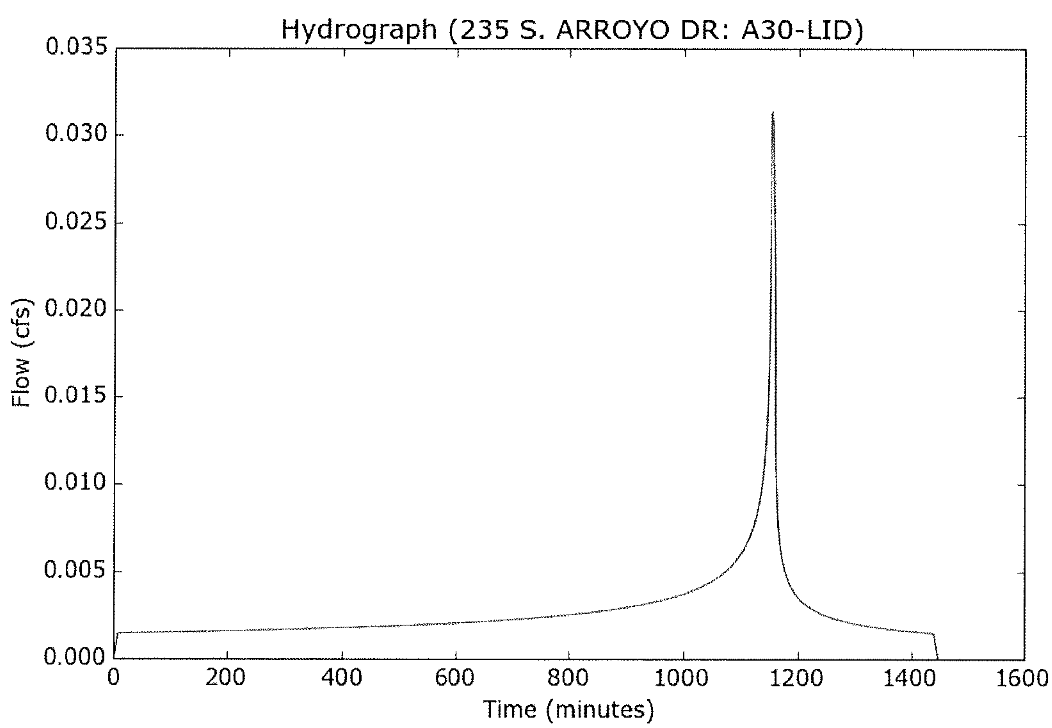
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A30-LID
Area (ac)	0.065
Flow Path Length (ft)	140.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.5358
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.0313
Burned Peak Flow Rate (cfs)	0.0313
24-Hr Clear Runoff Volume (ac-ft)	0.0054
24-Hr Clear Runoff Volume (cu-ft)	235.8722



Peak Flow Hydrologic Analysis

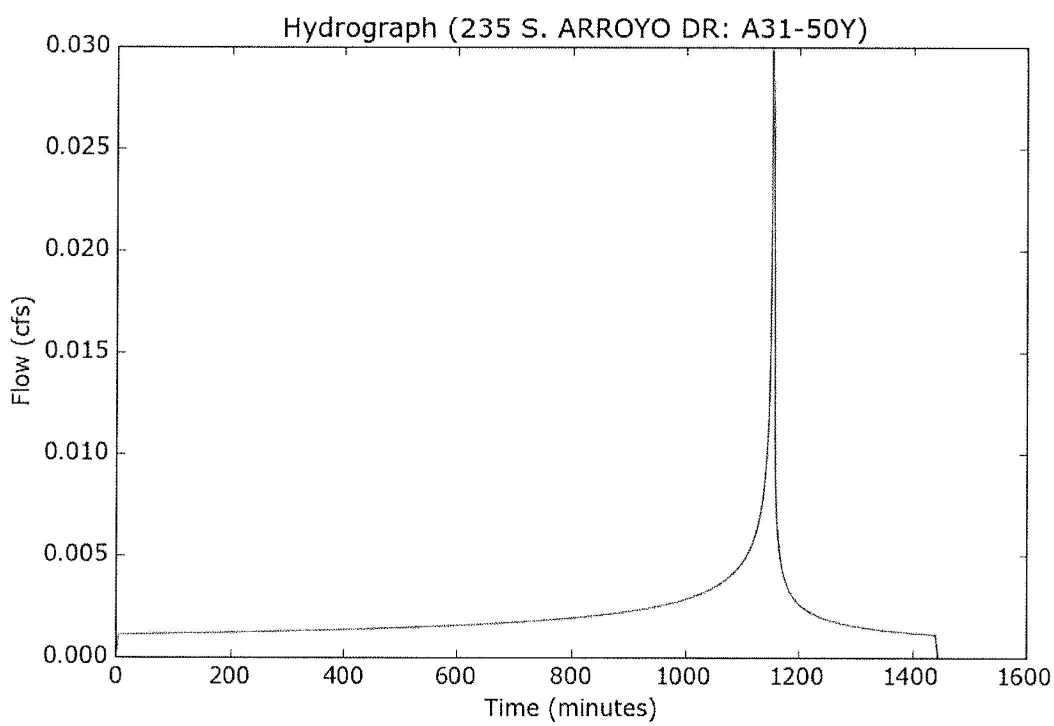
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A31-50Y
Area (ac)	0.008
Flow Path Length (ft)	135.0
Flow Path Slope (vft/hft)	0.093
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0299
Burned Peak Flow Rate (cfs)	0.0299
24-Hr Clear Runoff Volume (ac-ft)	0.0041
24-Hr Clear Runoff Volume (cu-ft)	180.1441



Peak Flow Hydrologic Analysis

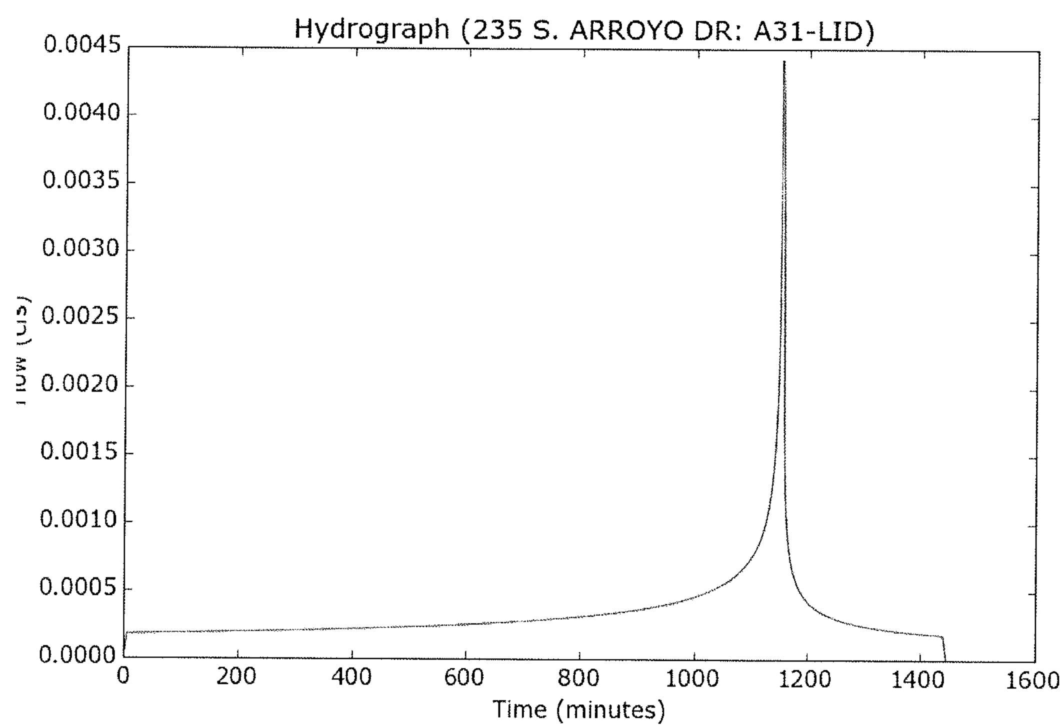
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A31-LID
Area (ac)	0.008
Flow Path Length (ft)	135.0
Flow Path Slope (vft/hft)	0.093
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6133
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0044
Burned Peak Flow Rate (cfs)	0.0044
24-Hr Clear Runoff Volume (ac-ft)	0.0007
24-Hr Clear Runoff Volume (cu-ft)	29.0304



Peak Flow Hydrologic Analysis

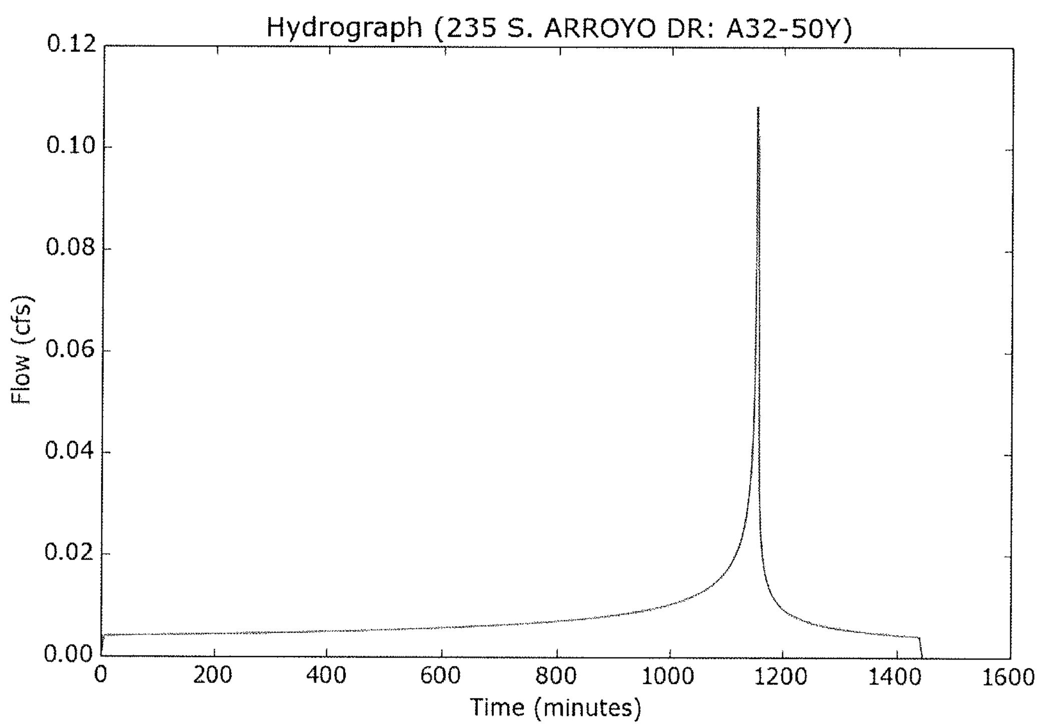
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A32-50Y
Area (ac)	0.029
Flow Path Length (ft)	27.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1082
Burned Peak Flow Rate (cfs)	0.1082
24-Hr Clear Runoff Volume (ac-ft)	0.015
24-Hr Clear Runoff Volume (cu-ft)	653.0222



Peak Flow Hydrologic Analysis

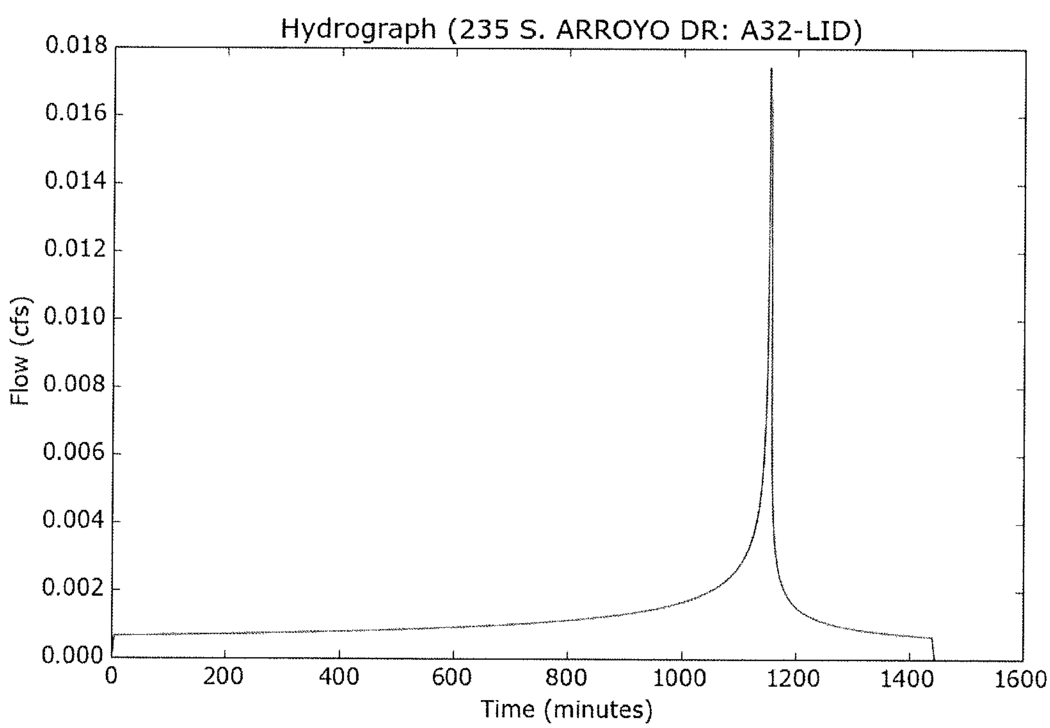
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A32-LID
Area (ac)	0.029
Flow Path Length (ft)	27.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0174
Burned Peak Flow Rate (cfs)	0.0174
24-Hr Clear Runoff Volume (ac-ft)	0.0024
24-Hr Clear Runoff Volume (cu-ft)	105.2352



Peak Flow Hydrologic Analysis

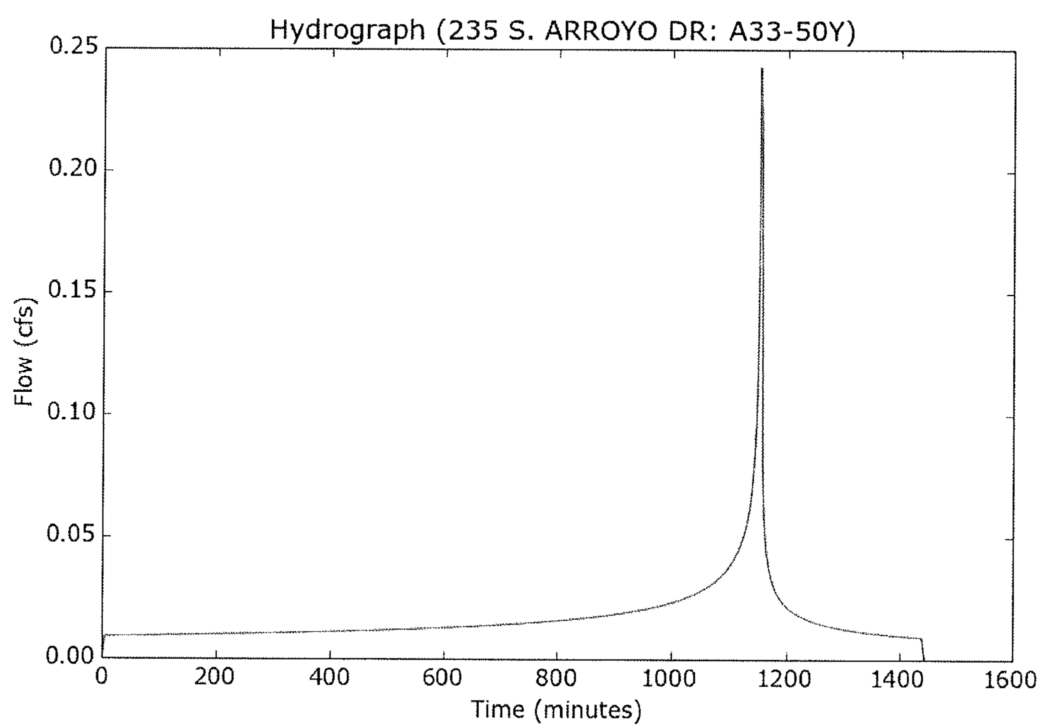
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A33-50Y
Area (ac)	0.065
Flow Path Length (ft)	153.0
Flow Path Slope (vft/hft)	0.039
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2426
Burned Peak Flow Rate (cfs)	0.2426
24-Hr Clear Runoff Volume (ac-ft)	0.0336
24-Hr Clear Runoff Volume (cu-ft)	1463.6705



Peak Flow Hydrologic Analysis

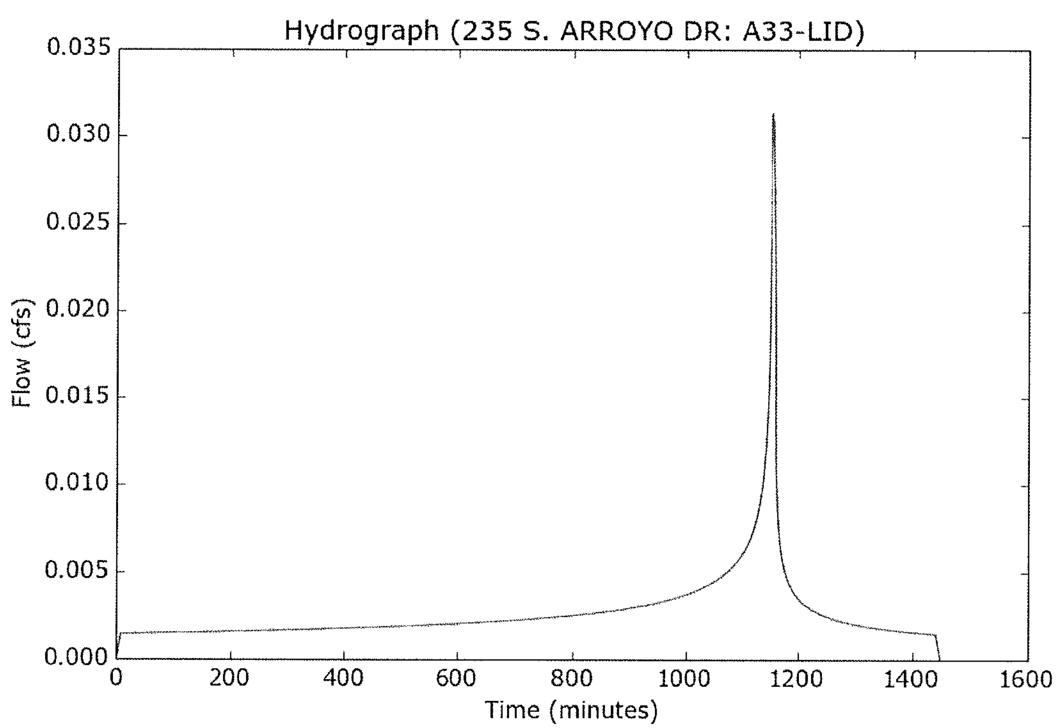
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A33-LID
Area (ac)	0.065
Flow Path Length (ft)	153.0
Flow Path Slope (vft/hft)	0.039
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.5358
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.0313
Burned Peak Flow Rate (cfs)	0.0313
24-Hr Clear Runoff Volume (ac-ft)	0.0054
24-Hr Clear Runoff Volume (cu-ft)	235.8722



Peak Flow Hydrologic Analysis

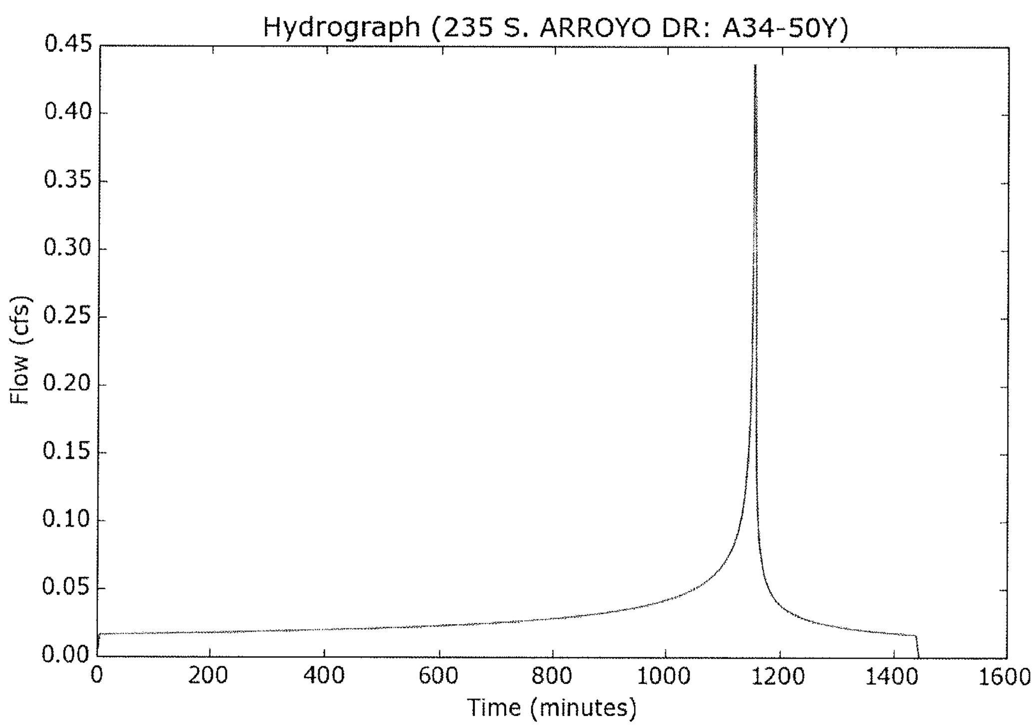
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A34-50Y
Area (ac)	0.117
Flow Path Length (ft)	40.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4366
Burned Peak Flow Rate (cfs)	0.4366
24-Hr Clear Runoff Volume (ac-ft)	0.0605
24-Hr Clear Runoff Volume (cu-ft)	2634.6068



Peak Flow Hydrologic Analysis

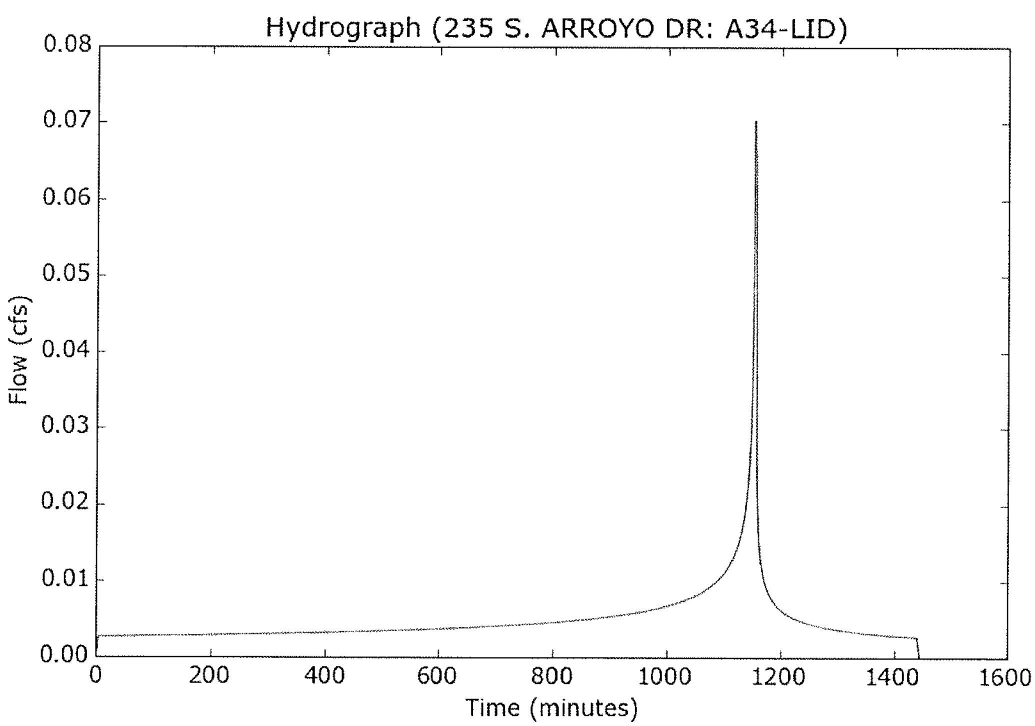
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A34-LID
Area (ac)	0.117
Flow Path Length (ft)	40.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0704
Burned Peak Flow Rate (cfs)	0.0704
24-Hr Clear Runoff Volume (ac-ft)	0.0097
24-Hr Clear Runoff Volume (cu-ft)	424.5697



Peak Flow Hydrologic Analysis

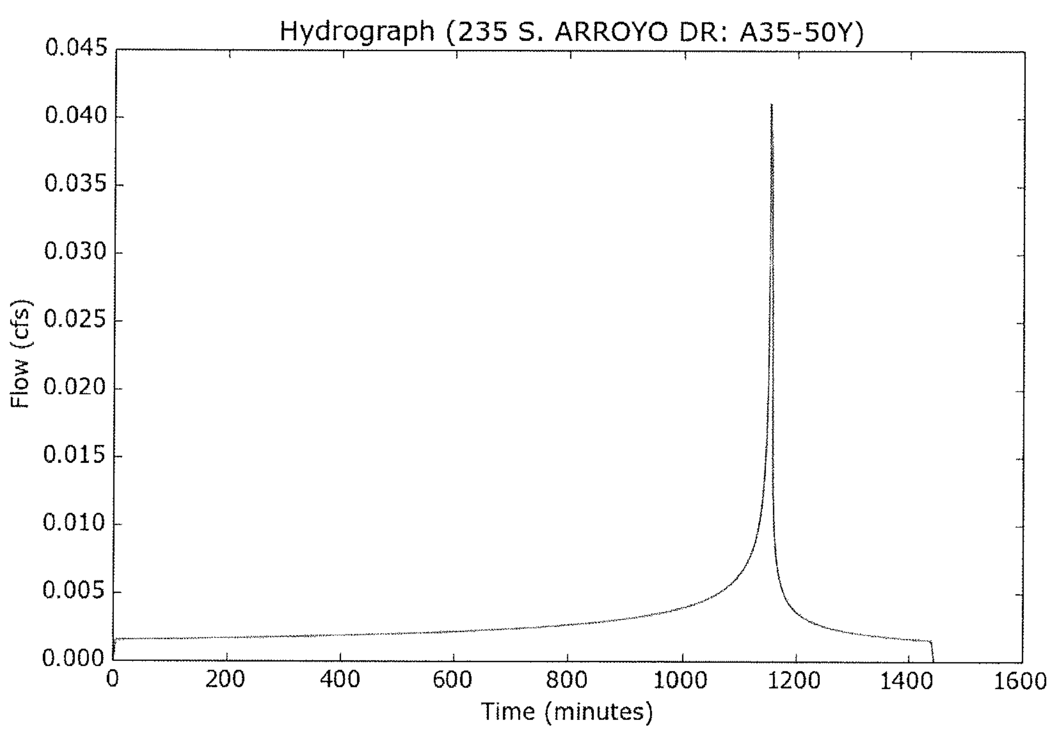
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A35-50Y
Area (ac)	0.011
Flow Path Length (ft)	37.0
Flow Path Slope (vft/hft)	0.5
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0411
Burned Peak Flow Rate (cfs)	0.0411
24-Hr Clear Runoff Volume (ac-ft)	0.0057
24-Hr Clear Runoff Volume (cu-ft)	247.6981



Peak Flow Hydrologic Analysis

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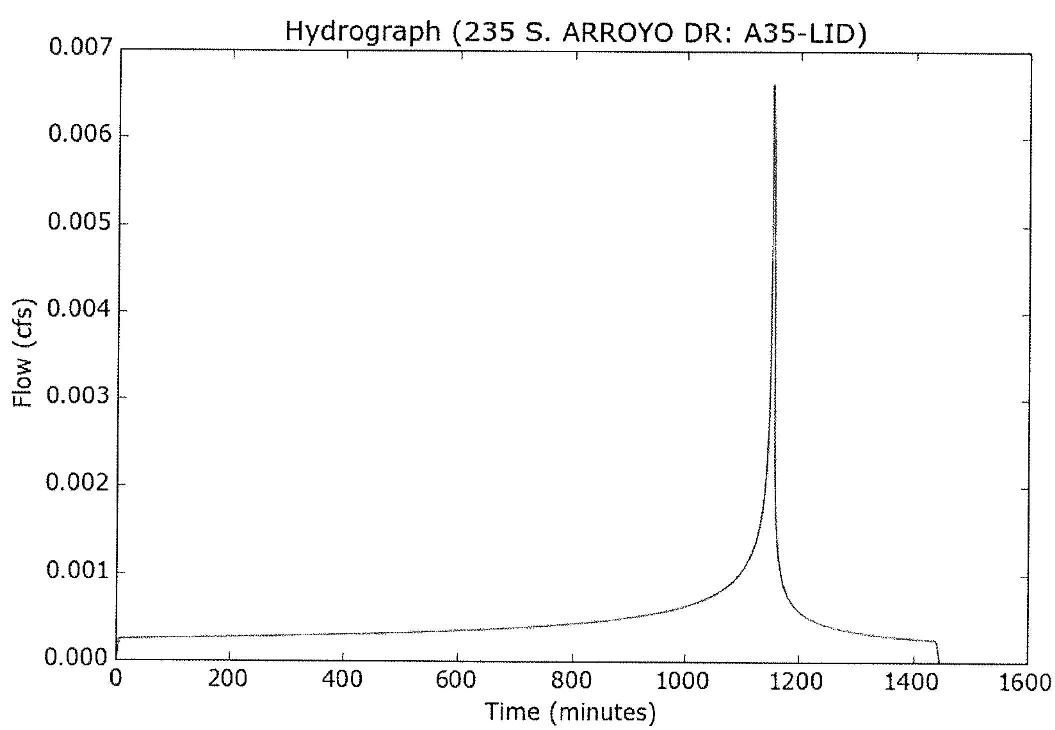
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A35-LID
Area (ac)	0.011
Flow Path Length (ft)	37.0
Flow Path Slope (vft/hft)	0.5
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0066
Burned Peak Flow Rate (cfs)	0.0066
24-Hr Clear Runoff Volume (ac-ft)	0.0009
24-Hr Clear Runoff Volume (cu-ft)	39.9168



Peak Flow Hydrologic Analysis

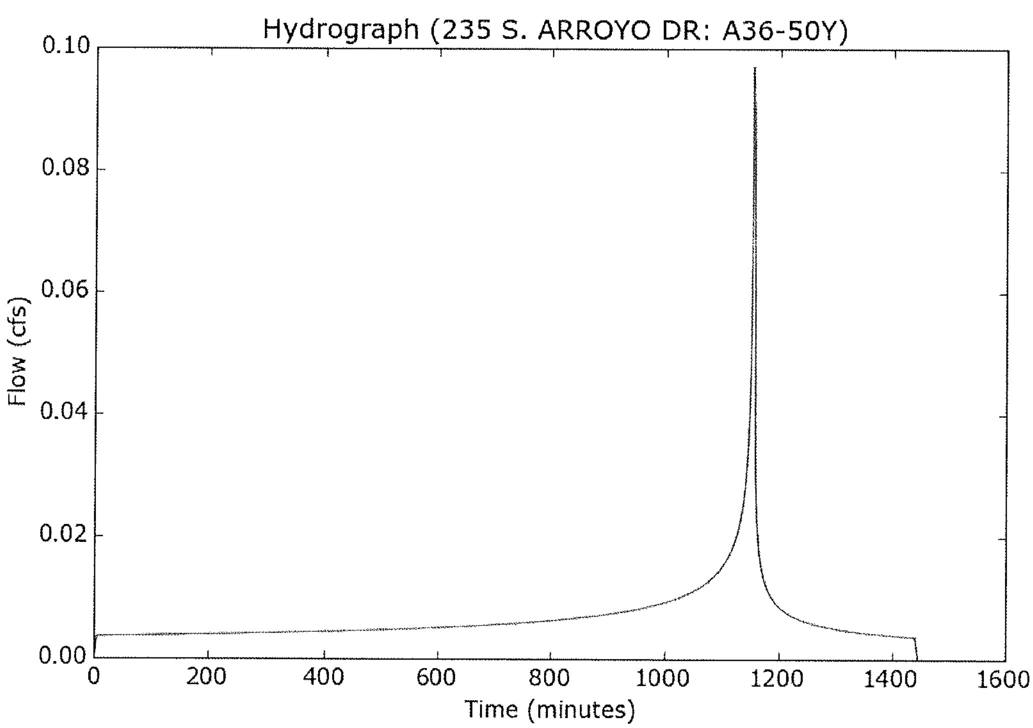
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A36-50Y
Area (ac)	0.026
Flow Path Length (ft)	20.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.097
Burned Peak Flow Rate (cfs)	0.097
24-Hr Clear Runoff Volume (ac-ft)	0.0134
24-Hr Clear Runoff Volume (cu-ft)	585.4682



Peak Flow Hydrologic Analysis

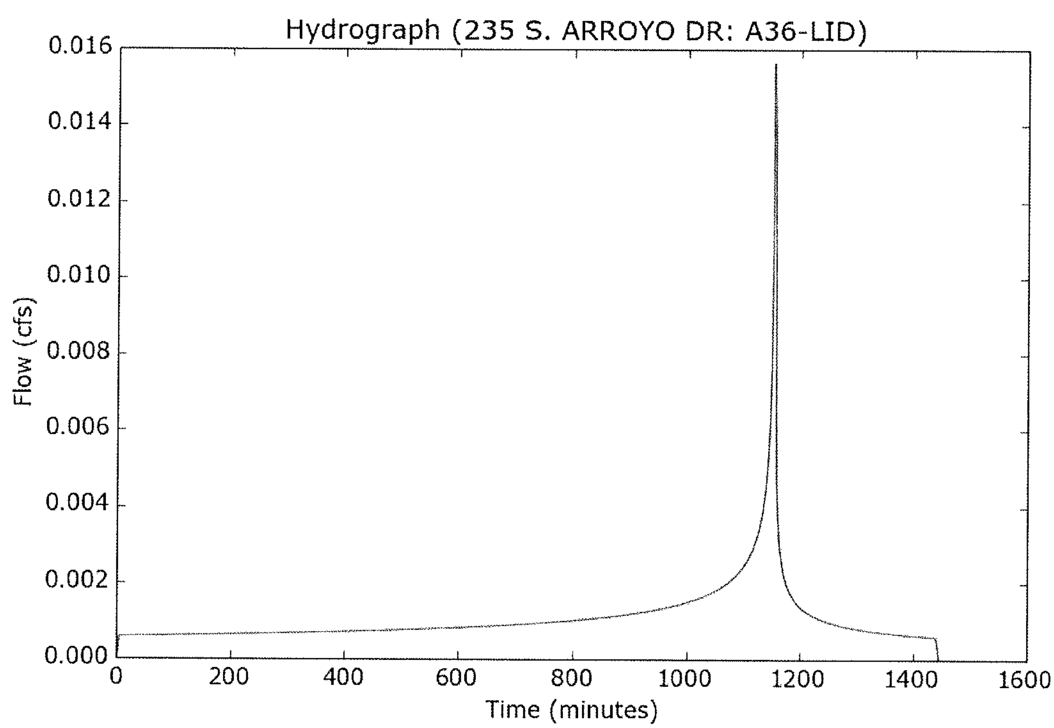
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A36-LID
Area (ac)	0.026
Flow Path Length (ft)	20.0
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0156
Burned Peak Flow Rate (cfs)	0.0156
24-Hr Clear Runoff Volume (ac-ft)	0.0022
24-Hr Clear Runoff Volume (cu-ft)	94.3488



Peak Flow Hydrologic Analysis

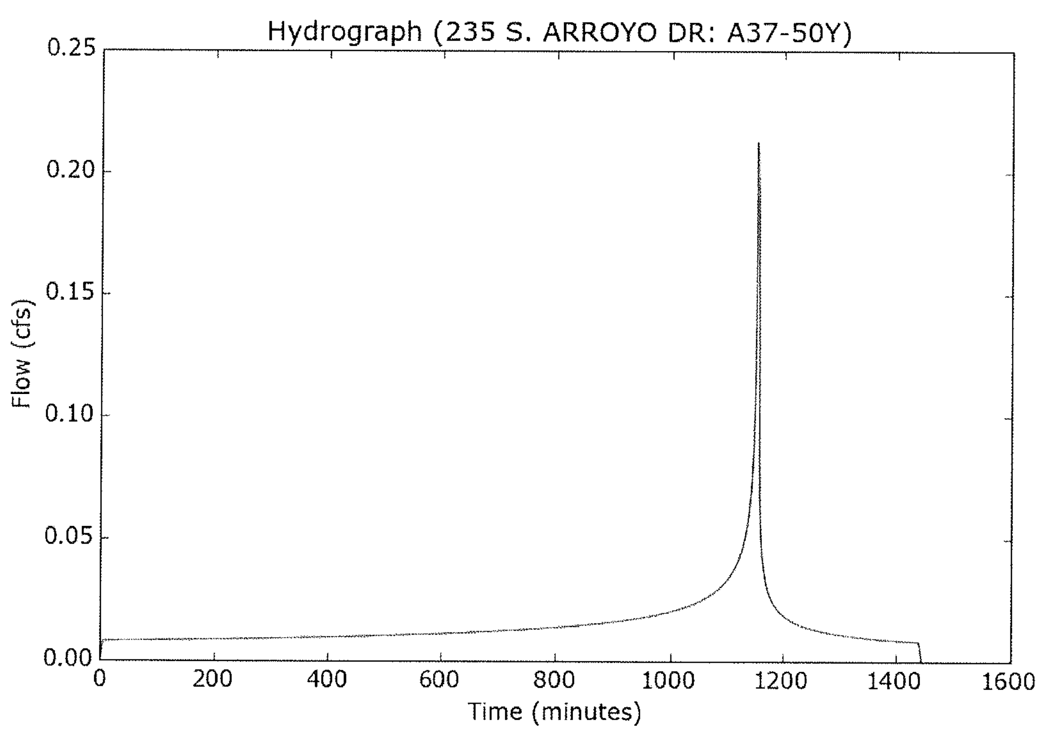
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A37-50Y
Area (ac)	0.057
Flow Path Length (ft)	30.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2127
Burned Peak Flow Rate (cfs)	0.2127
24-Hr Clear Runoff Volume (ac-ft)	0.0295
24-Hr Clear Runoff Volume (cu-ft)	1283.5264



Peak Flow Hydrologic Analysis

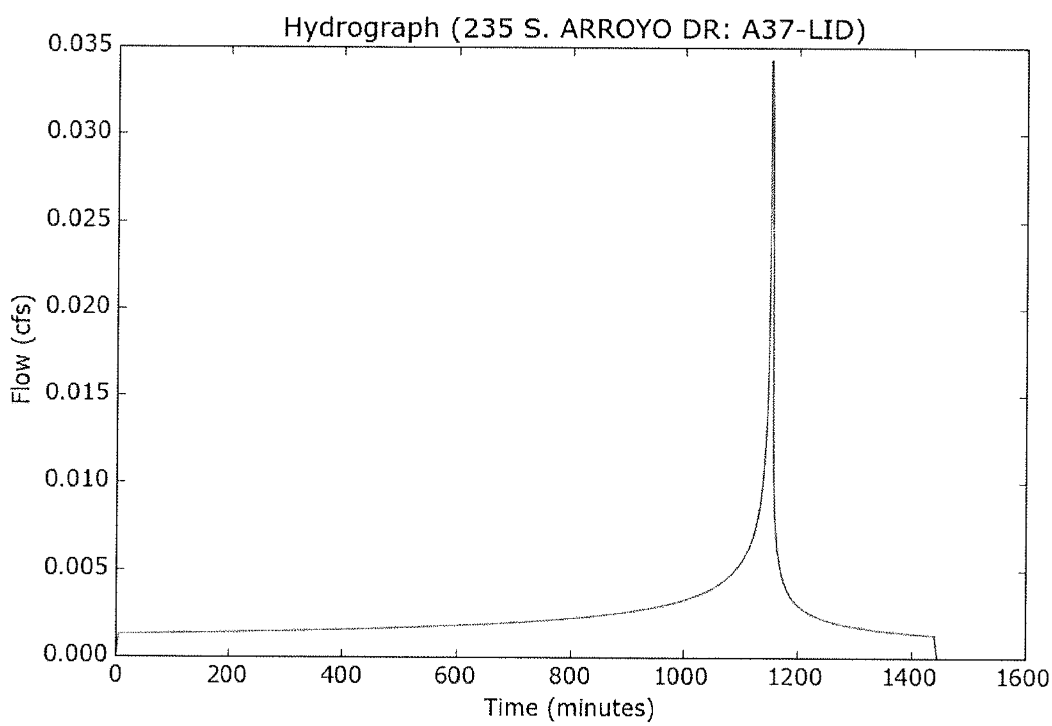
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A37-LID
Area (ac)	0.057
Flow Path Length (ft)	30.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0343
Burned Peak Flow Rate (cfs)	0.0343
24-Hr Clear Runoff Volume (ac-ft)	0.0047
24-Hr Clear Runoff Volume (cu-ft)	206.8417



Peak Flow Hydrologic Analysis

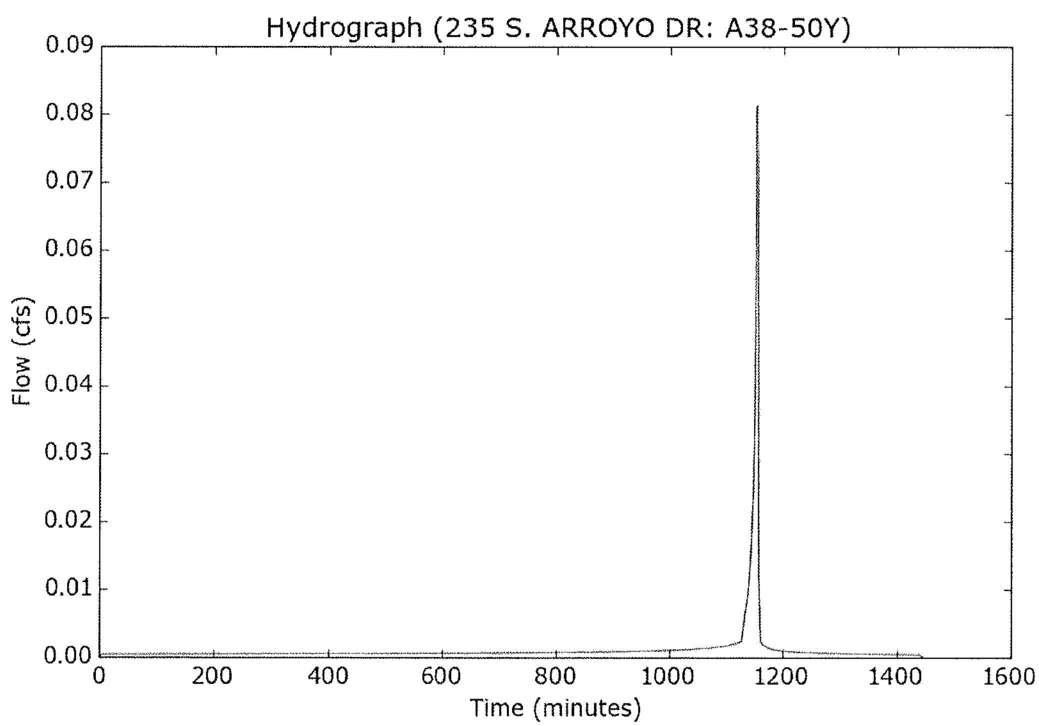
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A38-50Y
Area (ac)	0.024
Flow Path Length (ft)	51.0
Flow Path Slope (vft/hft)	0.05
50-yr Rainfall Depth (in)	6.95
Percent Impervious	0.01
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.8161
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0812
Burned Peak Flow Rate (cfs)	0.0812
24-Hr Clear Runoff Volume (ac-ft)	0.0023
24-Hr Clear Runoff Volume (cu-ft)	101.0428



Peak Flow Hydrologic Analysis

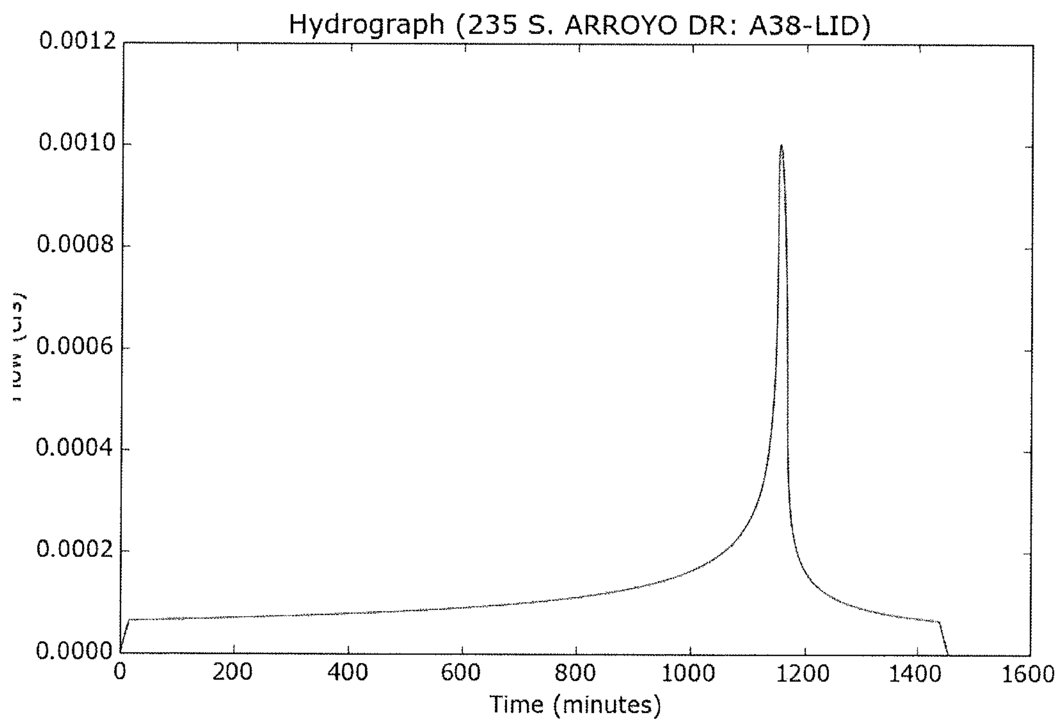
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A38-LID
Area (ac)	0.024
Flow Path Length (ft)	51.0
Flow Path Slope (vft/hft)	0.05
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	0.01
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.3868
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	0.001
Burned Peak Flow Rate (cfs)	0.001
24-Hr Clear Runoff Volume (ac-ft)	0.0002
24-Hr Clear Runoff Volume (cu-ft)	10.451



Peak Flow Hydrologic Analysis

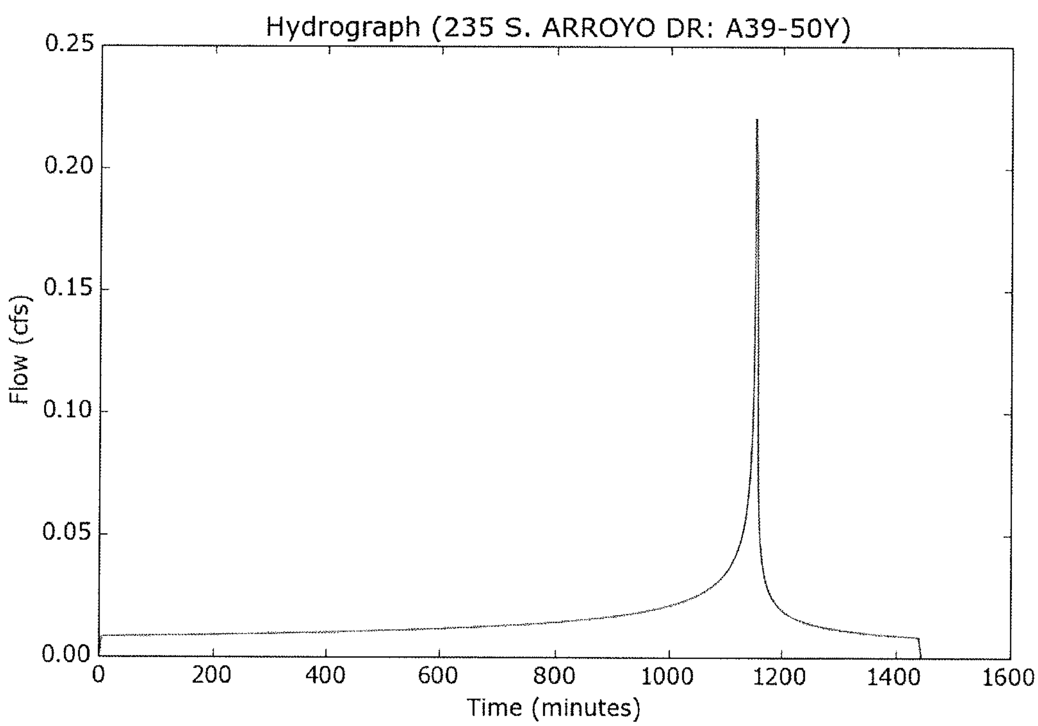
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A39-50Y
Area (ac)	0.059
Flow Path Length (ft)	43.0
Flow Path Slope (vft/hft)	0.092
50-yr Rainfall Depth (in)	6.95
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.95
Peak Intensity (in/hr)	4.1466
Undeveloped Runoff Coefficient (Cu)	0.8152
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2202
Burned Peak Flow Rate (cfs)	0.2202
24-Hr Clear Runoff Volume (ac-ft)	0.0305
24-Hr Clear Runoff Volume (cu-ft)	1328.5624



Peak Flow Hydrologic Analysis

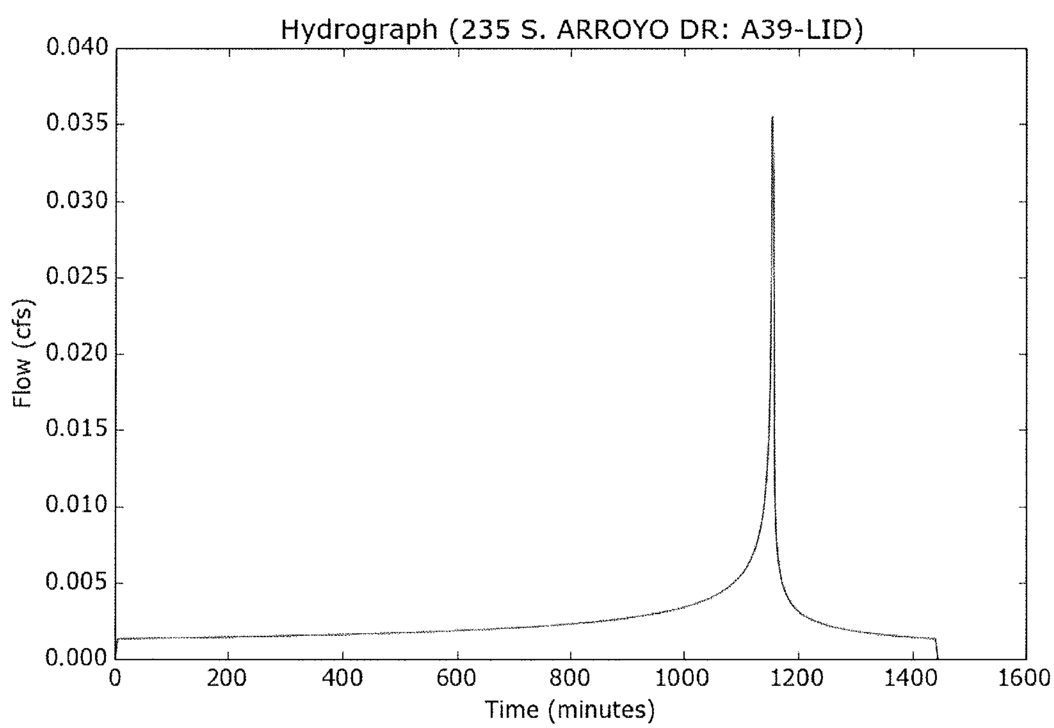
File location: D:/Smith/140714(235 S Arroyo Dr., San Gabriel, Ca 91776)-reference do not delete/GRADING/hydro/H&HC 7-13-17/HYDROCALC 7-13-17
Version: HydroCalc 1.0.2

Input Parameters

Project Name	235 S. ARROYO DR
Subarea ID	A39-LID
Area (ac)	0.059
Flow Path Length (ft)	43.0
Flow Path Slope (vft/hft)	0.092
85th Percentile Rainfall Depth (in)	1.12
Percent Impervious	1.0
Soil Type	14
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.12
Peak Intensity (in/hr)	0.6682
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0355
Burned Peak Flow Rate (cfs)	0.0355
24-Hr Clear Runoff Volume (ac-ft)	0.0049
24-Hr Clear Runoff Volume (cu-ft)	214.0993



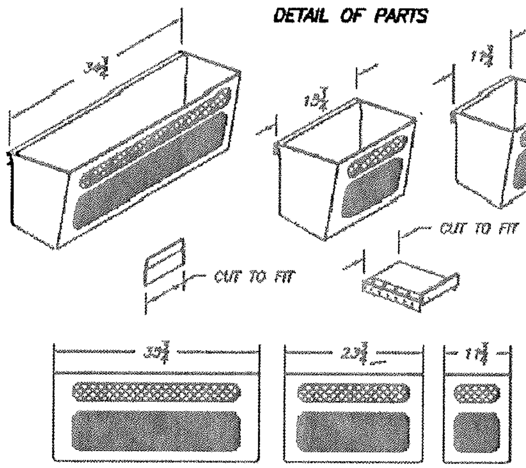
ATTACHMENT

B. PRODUCT SPECIFICATION

ENVIRO–SAFE HIGH CAPACITY GRATE INLET SKIMMER
CALIFORNIA CURB SHELF BASKET WATER CLEANSING SYSTEM
SAN DIEGO REGIONAL CONTINUOUS CURB INLET

FIGURE 1

DETAIL OF PARTS



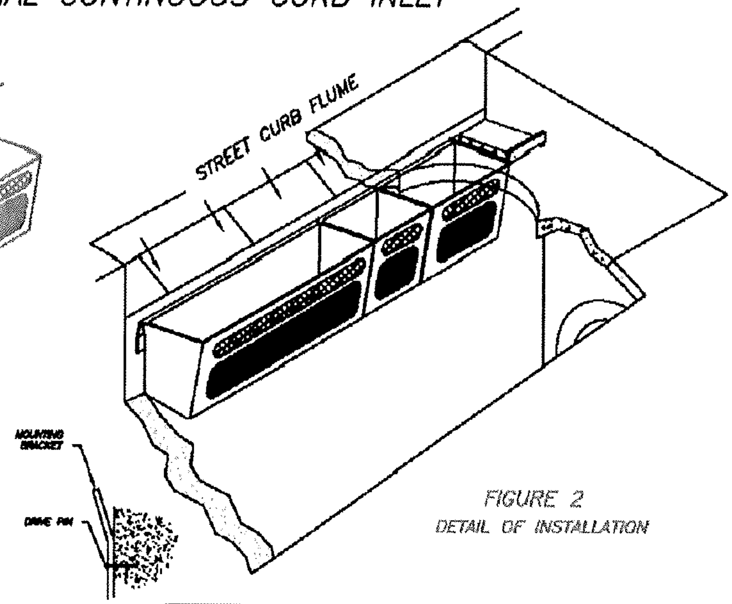


FIGURE 2

DETAIL OF INSTALLATION

WIDTH OF INLET WILL VARY

FLOW RATES per 3 FT. Basket				
$Q=SO*c_d*A\sqrt{2*g*h}$ c_d = [illegible] = .67				
	SO	$A(ft^2)$	h (ft)	Q ($\frac{ft^3}{s}$)
TOP FRONT	.62	85.1	7.9	1.6
BOTTOM FRONT	.56	179.4	12.4	3.8
BOTTOM	.68	165.9	18.0	5.1
TOTAL				10.6

The above flow rates are based on unobstructed screens.

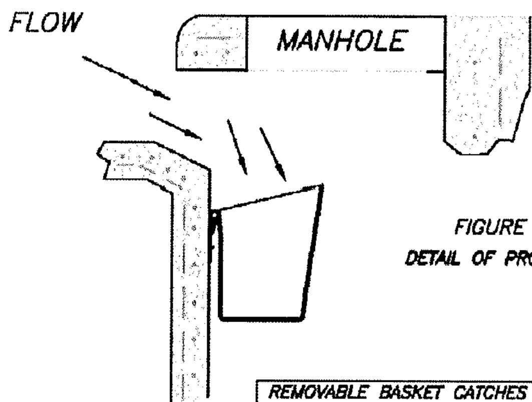


FIGURE 3

DETAIL OF PROCESS

REMOVABLE BASKET CATCHES EVERYTHING AND MAY BE REMOVED THROUGH MANHOLE WITHOUT ENTRY.

NOTES:

1. SHELF SYSTEM PROVIDES FOR ENTIRE COVERAGE OF INLET OPENING SO TO DIVERT ALL FLOW TO BASKET.
2. SHELF SYSTEM MANUFACTURED FROM MARINE GRADE FIBERGLASS,GEL COATED FOR UV PROTECTION.
3. SHELF SYSTEM ATTACHED TO THE CATCH BASIN WITH NON–CORROSIVE HARDWARE.
4. FILTRATION BASKET STRUCTURE MANUFACTURED OF MARINE GRADE FIBERGLASS,GEL COATED FOR UV PROTECTION.
5. FILTRATION BASKET FINE SCREEN AND COARSE CONTAINMENT SCREEN MANUFACTURED FROM STAINLESS STEEL.
6. FILTRATION BASKET HOLDS BOOM OF ABSORBENT MEDIA TO CAPTURE HYDROCARBONS. BOOM IS EASILY REPLACED WITHOUT REMOVING MOUNTING HARDWARE.
7. FILTRATION BASKET LOCATION IS DIRECTLY UNDER MANHOLE FOR EASY MAINTENANCE.

BOX MANUFACTURED FROM
MARINE GRADE FIBERGLASS & GEL
COATED FOR UV PROTECTION

5 YEAR MANUFACTURERS WARRANTY

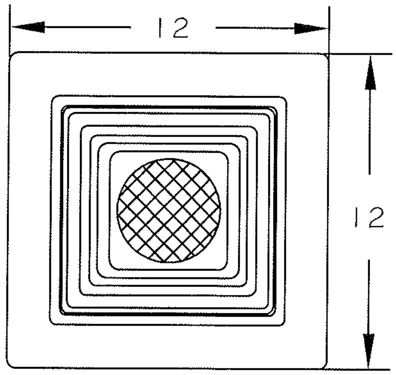
PATENTED

ALL FILTER SCREENS ARE STAINLESS STEEL

SUNTREE QUALITY PRODUCTS ARE BUILT FOR EASY CLEANING AND ARE DESIGNED TO BE PERMANENT INFRASTRUCTURE AND SHOULD LAST FOR DECADES.

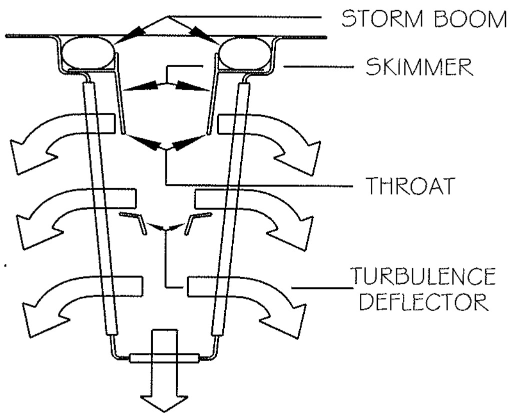
SUNTREE TECHNOLOGIES 798 CLEARLAKE RD. SUITE #2 COCOA FL. 32922 TEL. 321–637–7552 FAX 321–637–7554		
CURB INLET BASKET SYSTEM		
DATE: 04/12/04	SCALE:SF = 15	
DRAFTER: N.R.B.	UNITS =INCHES	

Part # GISB-12-12-12



TOP VIEW

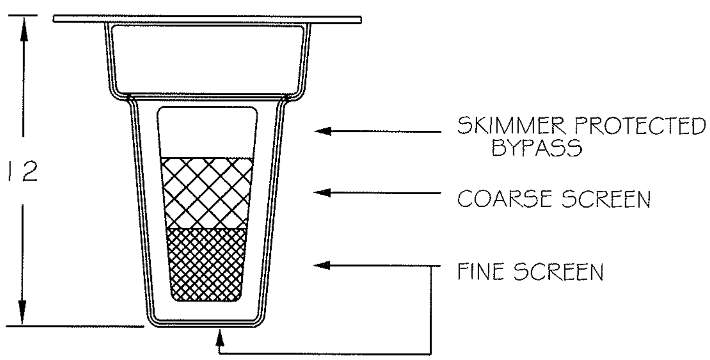
FLOW SCHEMATIC

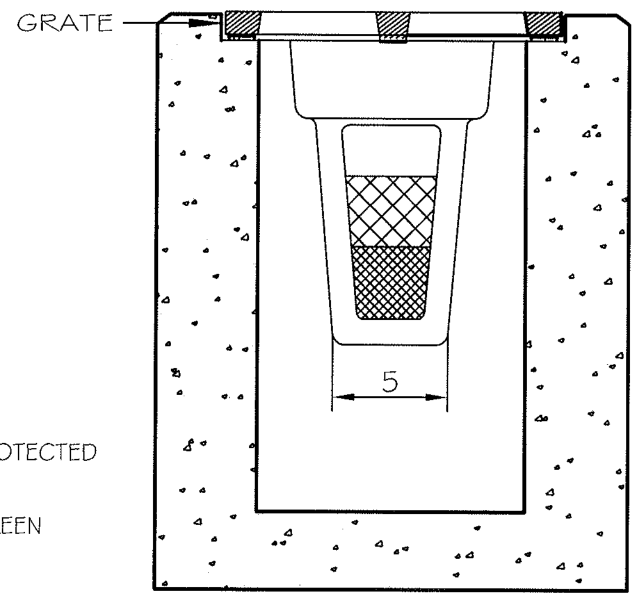


Flow Specifications

Description of filter opening	Percent Open (Based on Screen Dimensions)	Total Square Inches per Unit	Square Inches of Total Unobstructed Openings	Flow Rate (Cubic Feet per Second)
Skimmer protected By-Pass	100%	28.0	28.0	1.0 cfs
Coarse Screen 3/4" x 1-3/4" stainless steel flattened expanded	62%	28.0	17.3	.8 cfs
Medium Screen 10x10 mesh stainless steel	56%	28.0	15.8	.7 cfs
Fine screen 14 x 18 mesh stainless steel	68%	16.0	10.8	.6 cfs
THROAT FLOW RATE Total: 0.5cfs		TREATED FLOW RATE Total: 2.1 cfs		
FLOW RATES BASED ON UNOBSTRUCTED OPENINGS				

SIDE VIEW





CONCRETE STRUCTURE

REMOVE GRATE
INSERT GISB
REINSTALL GRATE

BOX MANUFACTURED FROM MARINE GRADE FIBERGLASS & GEL COATED FOR UV PROTECTION

5 YEAR MANUFACTURERS WARRANTY

PATENTED

ALL FILTER SCREENS ARE STAINLESS STEEL

EXCLUSIVE CALIFORNIA DISTRIBUTOR:
BIO CLEAN ENVIRONMENTAL SERVICE
P.O. BOX 869, OCEANSIDE, CA. 92049
TEL. 760-433-7640 FAX: 760-433-3176
Email: info@biocleanenvironmental.net

SUNTREE QUALITY PRODUCTS ARE BUILT FOR EASY CLEANING AND ARE DESIGNED TO BE PERMANENT INFRASTRUCTURE AND SHOULD LAST FOR DECADES.

NOTE: DETAIL DRAWINGS ARE 2 TO 1

6

SUNTREE TECHNOLOGIES 798 CLEARLAKE RD. SUITE #2 COCOA FL. 32922 TEL. 321-637-7552 FAX 321-637-7554		PROJECT	
GRATE INLET SKIMMER BOX GISB-12-12-12		REVISIONS	DATE
DATE: 04/12/04	SCALE: SF = 15	REVISIONS	DATE
DRAFTER: N.R.B.	UNITS = INCHES	REVISIONS	DATE

FG-LP-0002

NOTES:

1. Filter outlet adapter shall be constructed from stainless steel Type 304.

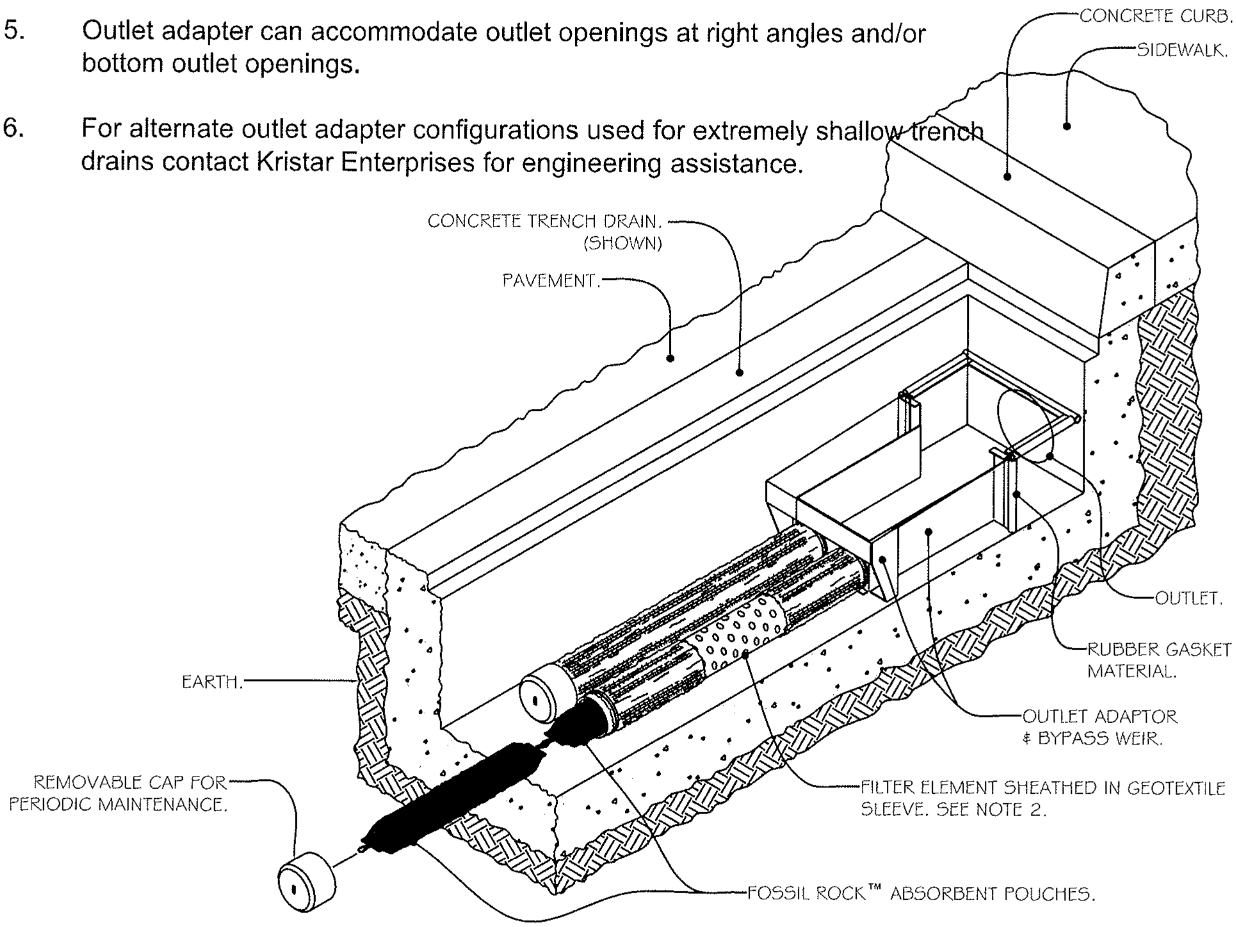
2. Filter element is constructed from polypropylene woven monofilament geotextile surrounding a perforated filter housing. Filter element shall not allow the retention of water between storm events.

3. Filter inserts are supplied with "clip-in" filter pouches utilizing fossil rock ™ filter medium for the collection and retention of petroleum hydrocarbons (oils & greases).

4. FloGard® LoPro ™ filter inserts and fossil rock ™ filter medium pouches must be maintained in accordance with manufacturer recommendations.

5. Outlet adapter can accommodate outlet openings at right angles and/or bottom outlet openings.

6. For alternate outlet adapter configurations used for extremely shallow trench drains contact Kristar Enterprises for engineering assistance.



TITLE

FloGard® LoPro™

TRENCH DRAIN FILTER INSERT

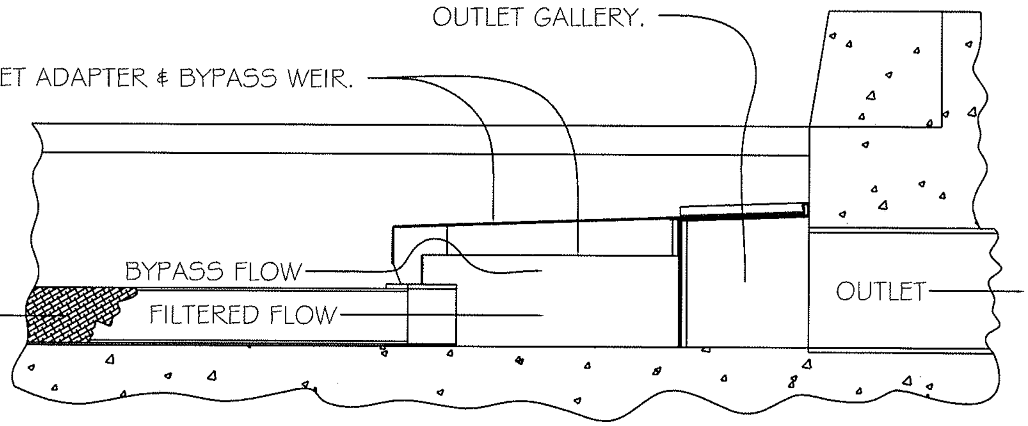
P4

KRISTAR

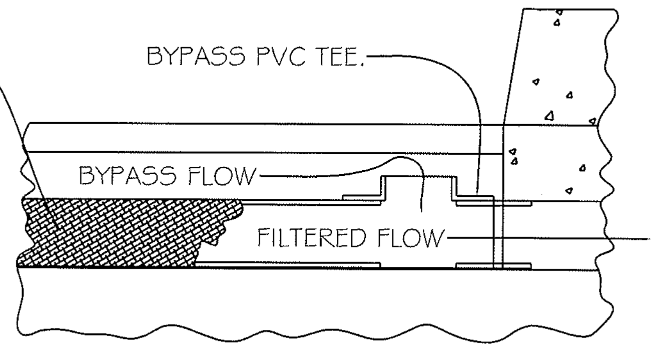
DRAWING NO.	REV	ECO DATE	DATE	
FG-LP-0002	C	0020 3/7/07	JPR 2/21/07	SHEET 1 OF 2

FG-LP-0002

DETAIL A
SECTION VIEW
SCALE: 1X



DETAIL B
SECTION VIEW
ALTERNATE ADAPTER CONFIGURATION
SCALE: 1X



SPECIFIER CHART

	MODEL	FILTER TYPE	TRENCH WIDTH "ID" (CLEAR OPENING)	MINIMUM TRENCH DEPTH (FROM BOTTOM OF GRATE)	SOLIDS STORAGE CAPACITY CUBIC FEET	FILTERED FLOW CUBIC FEET / SECOND	TOTAL BYPASS CAPACITY CUBIC FEET /SECOND
	FG-TDOF3	PIPE *	3.0	6.5	0.1	0.5	0.1
	FG-TDOF4	PIPE *	4.0	6.5	0.2	0.5	0.1
⇨	**FG-TDOF6**	**PIPE**	**6.0**	**6.5**	**0.4**	**0.5**	**0.2**
	FG-TDOF8	PIPE	8.0	6.5	0.7	0.5	0.3
	FG-TDOF10	PIPE	10.0	6.5	0.9	0.5	0.5
	FG-TDOF12	PIPE	12.0	6.5	0.9	1.0	0.6

* ALTERNATE ADAPTER CONFIGURATION. SEE DETAIL B.

TITLE

FloGard® LoPro™

P4

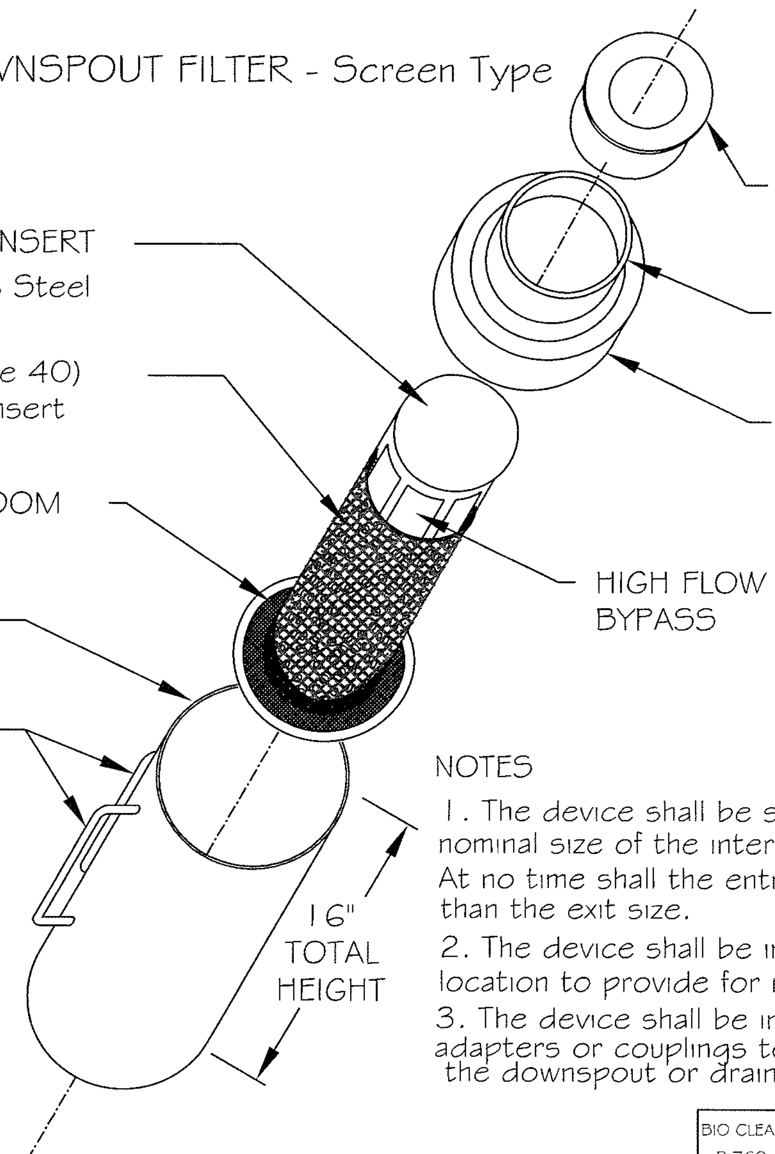
TRENCH DRAIN FILTER INSERT

KRISTAR

DRAWING NO.	REV	ECO	DATE	DATE	
FG-LP-0002	C	0020	3/7/07	JPR 2/21/07	SHEET 2 OF 2

BIO CLEAN 4" DIA DOWNSPOUT FILTER - Screen Type

MODEL #'S
BC-DF4, BC-DF6, BC-DF8



For Model# BC-DF4

For Model# BC-DF6

For Model# BC-DF8

TREATMENT FLOW RATE = 1.14 CFS
BYPASS FLOW RATE = 2.25 CFS

1.3 SQ FT FILTER SURFACE AREA

NOTES

1. The device shall be sized according to the nominal size of the interconnecting drainage system. At no time shall the entrance size be larger than the exit size.
2. The device shall be installed in an accessible location to provide for means of repair and maintenance.
3. The device shall be installed using approved adapters or couplings to attach the device to the downspout or drainage pipe.

(7)

BIO CLEAN ENVIRONMENTAL SERVICES, INC. P.O. BOX 869, OCEANSIDE, CA 92049
P 760-433-7640 F 760-433-3176 WWW.BIOCLEANENVIRONMENTAL.NET

SIZE	MODEL # BC-DF4 BC-DF6, BC-DF8	DWG NO. DOWNSPOUT FILTER	REV
SCALE N.T.S.		SHEET 1 OF 1	

ATTACHMENT

C. OPERATION AND MAINTENANCE GUIDELINES FOR BMPs

EXHIBIT 2

Operation and Maintenance Guideline

1.1 Operations and maintenance

Operation and maintenance (O&M) requirements for all Source Control, Site Design, and Treatment Control BMPs . This shall include the following:

1.1.1 O&M DESCRIPTION AND SCHEDULE:

BMP Name	Description of Activities	Frequency
Education of Property Owners	▪ Owner shall continue to familiar himself about the impacts that stormwater runoff can have on water quality. ▪ Owner shall be aware of proper disposal of used materials or hazardous wastes. ▪ Owner shall implement all BMP maintenance schedule	▪ Annually ▪ Daily ▪ Weekly
Employee Training/Education Program	▪ Owner shall prepare educational material regarding cleaning, maintenance, refinishing/painting, and both routine and emergency repairs of the landscape, hardscape, and parking areas.	▪ Annually
Street Sweeping Private Street and Parking Lots	▪ Owner shall keep the driveway aisles, private street and parking lot area clean & orderly. ▪ Owner shall implement sweeping of driveway aisle, private street and parking lot area by a vacuum type cleaner/sweeper. ▪ A contractor shall be hired by the Owner to sweep the site at a regular basis. ▪ Owner shall ensure that private street, driveway aisles and parking area is properly maintain and shall be responsible for the ongoing maintenance that is consistent with the County of Los Angeles guidelines.	▪ At all times ▪ Monthly ▪ Monthly ▪ Annually

BMP Name	Description of Activities	Frequency
Common Areas Catch Basin & Catch Basin/Trench Drain Inspection	▪ Inspect drainage facilities to ensure immediate repair of any Deterioration threatening structural integrity. ▪ Inspect & clean the catch basin before rainy season, the time period between October 1 and April 15 of each year, and re-cleaned as needed before they are 40% full.	▪ Regular ▪ Before Rainy Season
Landscape Irrigation Practices (S-8)	▪ Remove trash and debris and loose vegetation in irrigation areas ▪ Since the rain or pressure sensor was installed, it should be checked periodically to ensure proper function. ▪ Inspect and maintain irrigation equipment and components to ensure proper functionality. ▪ Clean equipment to prevent algae growth and vector breeding.	▪ Weekly ▪ At the beginning ▪ Annually ▪ Annually
Storm Drain Message and Signage (S-1)	▪ maintain the legibility and visibility of marker and signs, such as "NO DUMPING – DRAINS TO OCEAN" or equally effective phrase on each catch basin on-site.	▪ Annually
Building Material Selection (S-9)	▪ Maintain the integrity of structural elements	▪ At all times
The Pre-treatment Device, Downspout Filter by BIO CLEAN ENVIRONMENTAL SERVICES, INC. Model NO. BC-DF4	▪ Owner shall inspect and replace the filter screen, filter insert, and BioSorb Hydrocarbon Boom per manufacturing specification. ▪ Owner shall inspect the downspout body and fittings for serviceability. If not, the body and fitting will be replaced. ▪ Owner shall check the minor damage or defects. If found shall be corrected on the spot and a notation made on the Maintenance Record.	▪ Prior to rain event ▪ Prior to rain event ▪ Prior to rain event
The Pre-treatment Device, Curb Inlet Basket System by SUNTREE TECHNOLOGIES	▪ Owner shall sweep and remove of sediment and debris (litter, leaves, papers, and cans, etc.) within the device, especially around the drainage inlet. ▪ Owner shall inspect the basket for serviceability. If not, the basket will be replaced. ▪ Owner shall check the fine screen surface and the coarse screen. If the screen surface is more than 50% coated with a dark gray or black substance, the screen will be cleaned ▪ Owner shall check the condition of the fine screen and visually check the condition of the coarse screen. If the surface of the screen is broken, the screen will be replaced with new ones.	▪ Weekly ▪ Prior to rain event ▪ Prior to rain event ▪ Prior to rain event

BMP Name	Description of Activities	Frequency
The Pre-treatment Device, Grate Inlet Skimmer Box by SUNTREE TECHNOLOGIES Model GISB-12-12-12	■ Owner shall sweep and remove of sediment and debris (litter, leaves, papers, and cans, etc.) within the device, especially around the drainage inlet. ■ Owner shall inspect the skimmer for serviceability. If not, the screen will be replaced. ■ Owner shall check the fine screen surface and the coarse screen. If the screen surface is more than 50% coated with a dark gray or black substance, the screen will be cleaned ■ Owner shall check the condition of the fine screen and visually check the condition of the coarse screen. If the surface of the screen is broken, the screen will be replaced with new ones.	■ Weekly ■ Prior to rain event ■ Prior to rain event ■ Prior to rain event
The Pre-treatment Device, Trench Drain Filter Insert by KriStar Enterprises, Inc. Model No.: FG-TDOF 6	▪ Owner shall follow the recommendation from the vender ▪ Owner shall change the filter medium once per year ▪ Owner shall inspect & clean the trench drain grate shall be removed and set to one side. ▪ The service shall commence with collection and removal of sediment and debris (litter, leaves, papers, cans, etc.) Owner shall be responsible this operation. ▪ The trench drain shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable. ▪ Owner shall use an industrial vacuum. The collected materials shall be removed from the filter liner. ▪ Owner shall inspect for defects with the filter liner and filter medium pouches and continue serviceability and replace as necessary and the pouch tether re-attached to the stainless steel hooded outlet cover assembly. ▪ Owner shall replace the grate or cover	▪ Post construction ▪ Annually ▪ Quarterly and/or 40% full of dirt/ or as needed ▪ Quarterly and/or 40% full of dirt/ or as needed ▪ Quarterly and/or 40% full of dirt/ or as needed ▪ Quarterly and/or 40% full of dirt/ or as needed ▪ Quarterly and/or 40% full of dirt/ or as needed ▪ Annually
Infiltration Trench	■ Owner shall inspect after every major storm for the first few months to ensure proper functioning. Drain times should be observed to confirm that designed drain times has been achieved. ■ Owner shall inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, standing water, and material buildup.	■ After construction ■ Semi-annual and after extreme events

BMP Name	Description of Activities	Frequency
Infiltration Trench (continue)	▪ Owner shall check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time. ▪ Owner shall inspect pretreatment devices and diversion structures for damage, sediment buildup, and structural damage. ▪ Owner shall inspect trenches with filter fabric and trench should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition. ▪ Owner shall repair undercut and eroded areas at inflow and outflow structures. ▪ Owner shall remove sediment, debris, and oil/grease from pretreatment devices and overflow structures. ▪ Owner shall remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly. ▪ Owner shall clean out inlet/outlet structures, overflow, and trenches if necessary. ▪ Owner shall remove grass clippings, leaves, and accumulated sediment from the surface of the trench. ▪ Owner shall replace first layer of aggregate and filter fabric if clogging appears only to be at the surface. ▪ Owner shall clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion. ▪ Owner shall be responsible to the total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 72-hour infiltration rate limit. ▪ Owner shall be responsible to the trench walls should be excavated to expose clean soil. ▪ Owner shall be responsible to all of the stone aggregate and filter fabric or media must be removed. Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.	▪ Semi-annual and after extreme events ▪ Semi-annual and after extreme events ▪ Annual ▪ Standard maintenance (as needed) ▪ Standard maintenance (as needed) ▪ Semi-annual, more often as needed ▪ Annual ▪ Annual ▪ Annual ▪ Annual ▪ Upon failure ▪ Upon failure ▪ Upon failure

1.1.2 IDENTIFICATION OF RESPONSIBLE PARTY(IES):

Inspection and maintenance of BMPs shall be responsible by **ARROYO DEVELOPMENT LLC, the owner** of the property, who has the knowledge about the implement of all BMPs in the property. A contract for trash management and litter control, and hazardous waste removal, if any shall be made with outside contractors, as needed.

ARROYO DEVELOPMENT LLC, the owner shall be instructed in the environmental procedures regarding contamination and clean up. A maintenance schedule shall be established for all scheduled clean up procedures by **ARROYO DEVELOPMENT LLC, the owner**

ARROYO DEVELOPMENT LLC, the owner shall be responsible to all funding for operation, inspection, routine maintenance, and upkeep of stormwater quality control measures until such time that property is turned over to the new owner. The homeowners association fees will be the method of funding after transfer to new owner.

The Owner: ARROYO DEVELOPMENT LLC
Contact Person: Frank Lac
Address: 4037 ARDEN DRIVE, #5 EL MONTE, CA 91731
Tel No.: (626)443-8901

S-1: Storm Drain Message and Signage

Purpose

Waste material dumped into storm drain inlets can adversely impact surface and ground waters. In fact, any material discharged into the storm drain system has the potential to significantly impact downstream receiving waters. Storm drain messages have become a popular method of alerting and reminding the public about the effects of and the prohibitions against waste disposal into the storm drain system. The signs are typically stenciled or affixed near the storm drain inlet or catch basin. The message simply informs the public that dumping of wastes into storm drain inlets is prohibited and/or that the drain ultimately discharges into receiving waters.

General Guidance

- The signs must be placed so they are easily visible to the public.
- Be aware that signs placed on sidewalk will be worn by foot traffic.

Design Specifications

- Signs with language and/or graphical icons that prohibit illegal dumping, must be posted at designated public access points along channels and streams within the project area. Consult with Los Angeles County Department of Public Works (LACDPW) staff to determine specific signage requirements for channels and streams.
- Storm drain message markers, placards, concrete stamps, or stenciled language/icons (e.g., "No Dumping – Drains to the Ocean") are required at all storm drain inlets and catch basins within the project area to discourage illegal or inadvertent dumping. Signs should be placed in clear sight facing anyone approaching the storm drain inlet or catch basin from either side (see Figure D-1 and Figure D-2). LACDPW staff should be contacted to determine specific requirements for types of signs and methods of application. A stencil can be purchased for a nominal fee from LACDPW Building and Safety Office by calling (626) 458-3171. All storm drain inlet and catch basin locations must be identified on the project site map.

Maintenance Requirements

Legibility and visibility of markers and signs should be maintained (e.g., signs should be repainted or replaced as necessary). If required by LACDPW, the owner/operator or homeowner's association shall enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards and signs.

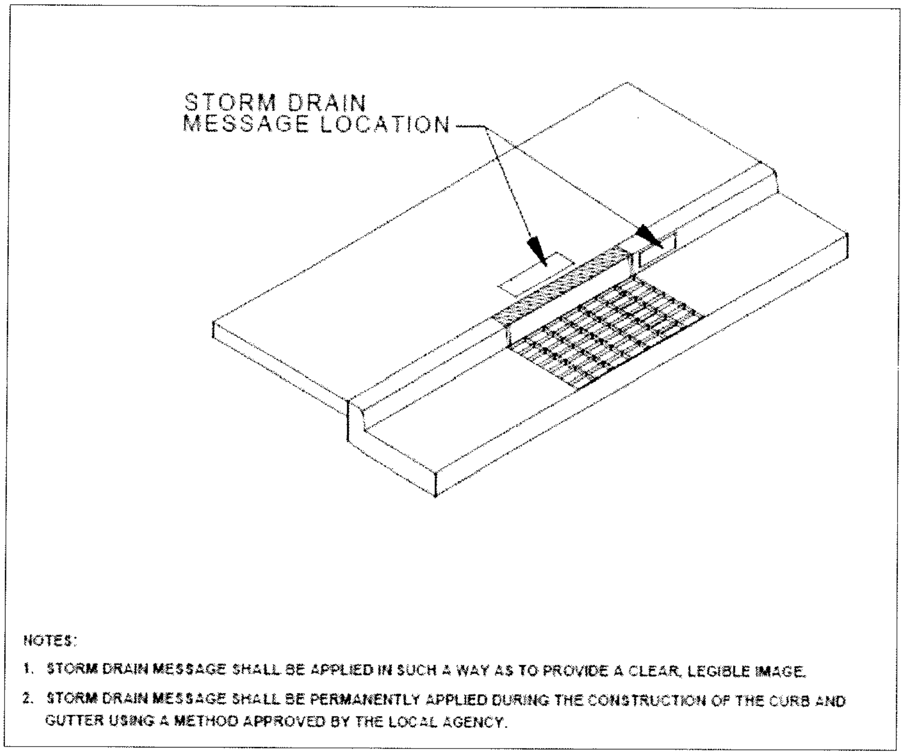


Figure D-1. Storm Drain Message Location – Curb Type Inlet

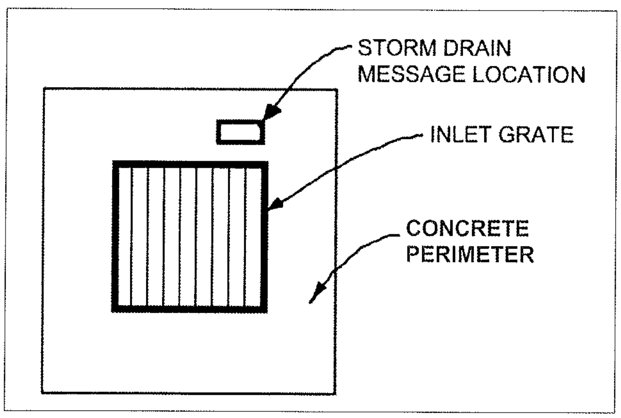


Figure D-2. Storm Drain Message Location – Catch Basin/Area Type Inlet

S-8: Landscape Irrigation Practices

Purpose

Irrigation runoff provides a pathway for pollutants (i.e., nutrients, bacteria, organics, sediment) to enter the storm drain system. By effectively irrigating, less runoff is produced resulting in less potential for pollutants to enter the storm drain system.

General Guidance

- Do not allow irrigation runoff from the landscaped area to drain directly to storm drain system.
- Minimize use of fertilizer, pesticides, and herbicides on landscaped areas.
- Plan sites with sufficient landscaped area and dispersal capacity (e.g., ability to receive irrigation water without generating runoff).
- Consult a landscape professional regarding appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Design Specifications

- Choose plants that minimize the need for fertilizer and pesticides.
- Group plants with similar water requirements and water accordingly.
- Use mulch to minimize evaporation and erosion.
- Include a vegetative boundary around project site to act as a filter.
- Design the irrigation system to only water areas that need it.
- Install an approved subsurface drip, pop-up, or other irrigation system.[1] The irrigation system should employ effective energy dissipation and uniform flow spreading methods to prevent erosion and facilitate efficient dispersion.
- Install rain sensors to shut off the irrigation system during and after storm events.
- Include pressure sensors to shut off flow-through system in case of sudden pressure drop. A sudden pressure drop may indicate a broken irrigation head or water line.
- If the hydraulic conductivity in the soil is not sufficient for the necessary water application rate, implement soil amendments to avoid potential geotechnical hazards (i.e., liquefaction, landslide, collapsible soils, and expansive soils).

---

[1] If alternative distribution systems (e.g., spray irrigation) are approved, the County will establish guidelines to implement these new systems.

- For sites located on or within 50 feet of a steep slope (15% or greater), do not irrigate landscape within three days of a storm event to avoid potential geotechnical instability.[2]
- Implement Integrated Pest Management practices.

For additional guidelines and requirements, refer to the Los Angeles County Department of Health Services.

Maintenance Requirements

Maintain irrigation areas to remove trash and debris and loose vegetation. Rehabilitate areas of bare soil. If a rain or pressure sensor is installed, it should be checked periodically to ensure proper function. Inspect and maintain irrigation equipment and components to ensure proper functionality. Clean equipment as necessary to prevent algae growth and vector breeding. Maintenance agreements between LACDPW and the owner/operator may be required. Failure to properly maintain building and property may subject the property owner to citation.

[2] As determined by the City of Los Angeles, Building and Safety Division

S-9: Building Materials Selection

Purpose

Building materials can potentially contribute pollutants of concern to stormwater runoff through leaching. For example, metal buildings, roofing, and fencing materials may be significant sources of metals in stormwater runoff, especially due to acidic precipitation. The use of alternative building materials can reduce pollutant sources in stormwater runoff by eliminating compounds that can leach into stormwater runoff. Alternative building materials may also reduce the need to perform maintenance activities (i.e., painting) that involve pollutants of concern, and may reduce the volume of stormwater runoff. Alternative materials are available to replace lumber and paving.

Design Specifications

Lumber

Decks and other house components constructed using pressure-treated wood that is typically treated using arsenate, copper, and chromium compounds are hazardous to the environment. Pressure-treated wood may be replaced with cement-fiber or vinyl.

Roofs, Fencing, and Metals

Minimizing the use of copper and galvanized (zinc-coated) metals on buildings and fencing can reduce leaching of these pollutants into stormwater runoff. The following building materials are conventionally made of galvanized metals:

- Metal roofs;
- Chain-link fencing and siding; and
- Metal downspouts, vents, flashing, and trim on roofs.

Architectural use of copper for roofs and gutters should be avoided. As an alternative to copper and galvanized materials, coated metal products are available for both roofing and gutter application. Vinyl-coated fencing is an alternative to traditional galvanized chain-link fences. These products eliminate contact of bare metal with precipitation or stormwater runoff, and reduce the potential for stormwater runoff contamination. Roofing materials are also made of recycled rubber and plastic.

Green roofs may be an option. Green roofs use vegetation such as grasses and other plants as an exterior surface. The plants reduce the velocity of stormwater runoff and absorb water to reduce the volume of stormwater runoff. One potential problem with using green roofs in the Los Angeles County area is the long, hot and dry summers, which may kill the plants if they are not watered. See the Green Roof Fact Sheet (RET-7) in Appendix E.

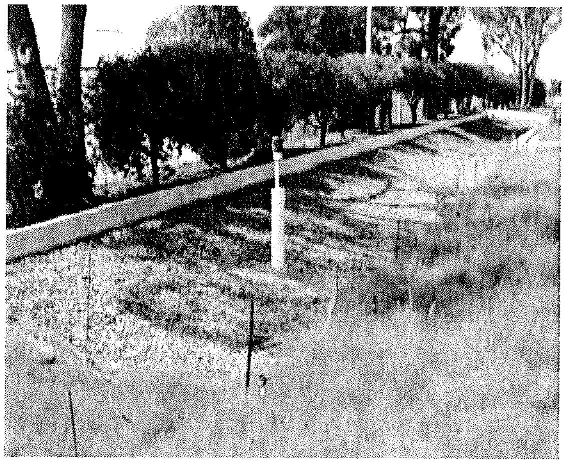
Pesticides

The use of pesticides around foundations can be reduced through the use of alternative barriers. Sand barriers can be applied around foundations to deter termites, as they cannot tunnel through sand. Metal shields also block termites from tunneling. Additionally, diatomaceous earth can be used to repel or kill a wide variety of other pests.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., signs) must be maintained by the owner/operator as required by local codes and ordinances. Maintenance agreements between LACDPW and the owner/operator may be required. Failure to properly maintain building and property may subject the property owner to citation.

RET-3: Infiltration Trench



Description

An infiltration trench is a narrow trench constructed in naturally pervious soils designed for retaining and infiltrating stormwater runoff into the underlying native soils and groundwater table. Infiltration trenches are typically filled with gravel and sand, although use of manufactured percolation tank modules may be considered in place of gravel fill. Infiltration trenches provide stormwater runoff treatment through a variety of natural mechanisms (i.e., filtration, adsorption, biological degradation) as water flows through the soil profile.

Infiltration trenches differ from infiltration basins in that the former are used for small drainage areas and stores stormwater runoff out of sight underground within the void spaces of rocks or stones or percolation tank modules. Infiltration basins are used for larger drainage areas and stormwater is stored within a visible ponded surface.

Infiltration vaults and infiltration leach fields are subsurface variations of the infiltration trench concept in which stormwater runoff is distributed to the upper zone of the subsurface gravel bed by means of perforated pipes.

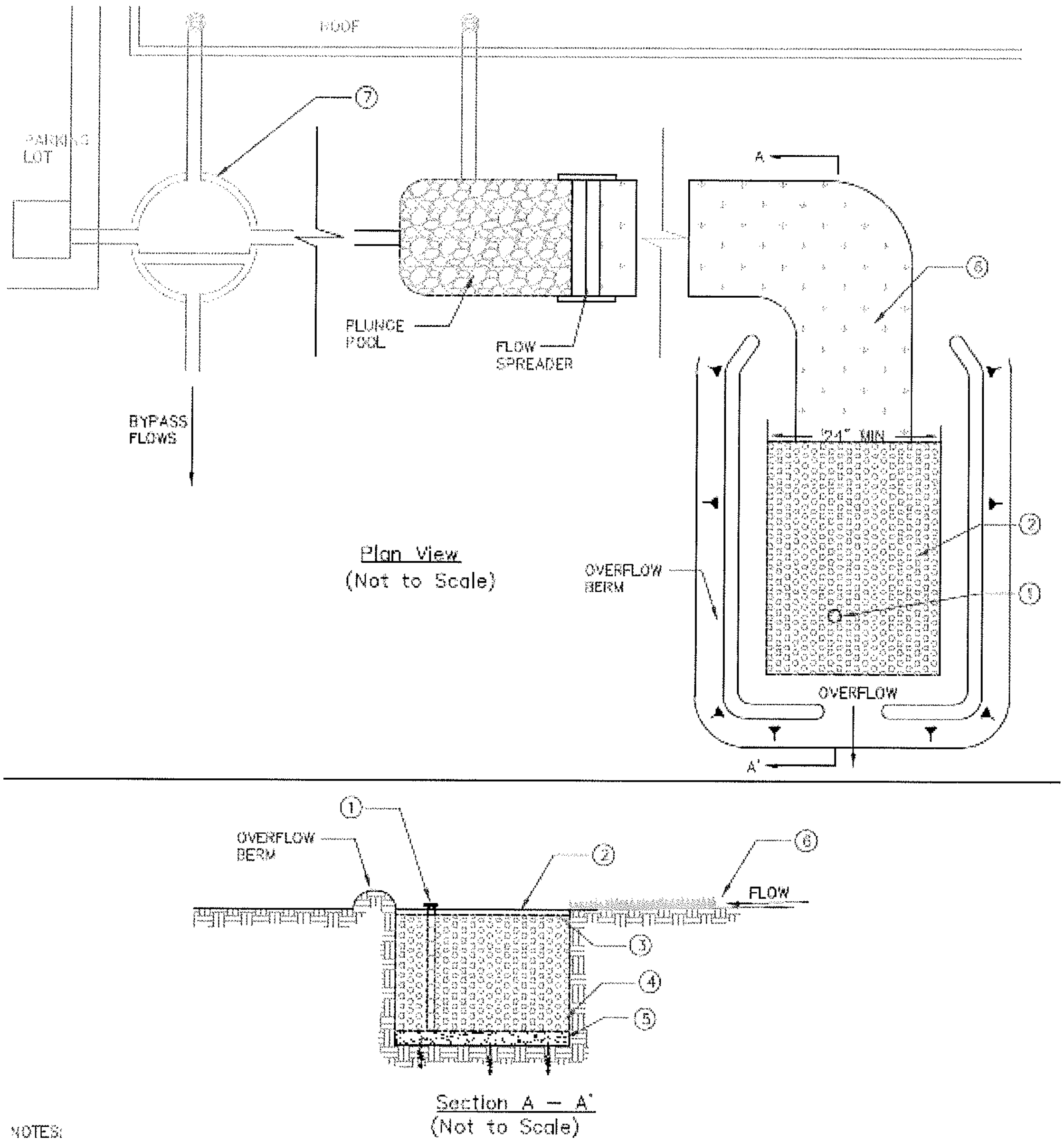
A schematic of a typical infiltration trench is presented in Figure E-3.

LID Ordinance Requirements

Infiltration trenches can be used to meet the on-site retention requirements of the LID Ordinance. Infiltration trenches will prevent pollutants in the SWQDv from being discharged off-site.

Advantages

- Reduces or eliminates stormwater runoff discharge to receiving water for most storm events
- Reduces peak stormwater runoff, which provides erosion control
- Provides groundwater recharge
- Provides effective treatment through settling and filtering while requiring relatively small space.
- Fits in narrow areas and unused areas of a development site.
- Is suitable for use when water is not available for irrigation or base flow.



NOTES:

① OBSERVATION WELL WITH LOCKABLE ABOVE–GROUND CAP

② 2" PEA GRAVEL FILTER LAYER

③ PROVIDE FILTER FABRIC IF NO PRETREATMENT IS PROVIDED

④ 3' – 5' DEEP TRENCH FILLED WITH 2" – 6" DIAMETER CLEAN STONE WITH 30% – 40% VOIDS

⑤ 6" DEEP SAND FILTER LAYER (OR FABRIC EQUIVALENT)

⑥ RUNOFF FILTERS THROUGH GRASS FILTER STRIP OR VEGETATED SWALE

⑦ OPTIONAL FLOW CONTROL DEVICE FOR OFF–LINE CONFIGURATIONS

Figure E-3. Infiltration Trench Schematic

Disadvantages

- Is not appropriate for areas with too low or too high permeability soils
- May not be appropriate for industrial sites or locations with contaminated soils or where spills may occur because of the potential threat to groundwater contamination
- Must be protected from high sediment loads
- May result in standing water, which may allow vector breeding
- Is not appropriate on fill or sites with steep slopes

General Constraints and Implementation Considerations

- Infiltration trenches can be integrated into open space buffers and other landscape areas.
- The potential for groundwater contamination must be carefully considered,. Infiltration trenches are not suitable for sites that:
  - Use or store chemicals or hazardous materials, unless they are prevented from entering the trench; or
  - Un-remediated “brownfield sites” where there is known groundwater or soil contamination.
- Infiltration trenches should be sited away from tree drip lines and kept free of vegetation.
- If the corrected in-situ infiltration rate exceed 2.4 in/hr, then stormwater runoff may need to be fully-treated with an upstream stormwater quality control measure prior to infiltration to protect groundwater quality.
- Infiltration trenches cannot be located on sites with a slope greater than 15 percent.
- Pretreatment to remove sediment is required to protect infiltration trench from high sediment loads.
- If possible, the entire tributary area of the infiltration trench should be stabilized before construction begins. If this is not possible, all flows should be diverted around the infiltration trench to protect it from sediment loads during construction or the top two inches of soil from the infiltration trench floor should be removed after the site has been stabilized. Excavated material should be stored such that it cannot be washed back into the infiltration trench if a storm occurs during construction.
- The equipment used to construct the infiltration trench should have extra wide low-pressure tires. Construction traffic should not enter the infiltration trench because it can compact soil, which reduces infiltration capacity. If heavy equipment is used on the base of the infiltration trench, the infiltrative capacity may be restored by tilling or aerating prior to placing the infiltrative bed.

- Clean, washed gravel should be placed in the excavated trench in lifts and lightly compacted with a plate compactor. Use of unwashed gravel can result in clogging.
- A geomembrane liner should be installed generously with overlapping seams on sides, bottom, and one foot below the surface of the infiltration trench.
- After construction is completed, the entire tributary area of the infiltration trench should be stabilized before allowing stormwater runoff to enter it.
- An observation well must be installed to check water levels, detention time, and evidence of clogging. An access road along the entire length of the infiltration trench is required unless it is located along an existing road or parking lot that can be safely used for maintenance access.

Design Specifications

The following sections provide design specifications for infiltration trenches.

Geotechnical

Due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and potential for insufficient infiltration capacity, an extensive geotechnical site investigation must be conducted during the site planning process to verify site suitability for an infiltration trench. All geotechnical investigations must be performed according to the most recent GMED Policy GS 200.1. Soil infiltration rates and the groundwater table depth must be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration trench. The project applicant must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist on-site to allow the construction of a properly functioning infiltration trench.

Infiltration trenches are appropriate for soils with a minimum corrected in-situ infiltration rate of 0.3 in/hr. The geotechnical report must determine if the proposed project site is suitable for an infiltration trench and must recommend a design infiltration rate (see "Design Infiltration Rate" under the "Sizing" section). The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move through the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Pretreatment

Pretreatment is important for all structural stormwater quality control measures, but it is particularly important for retention facilities. Pretreatment refers to design features that provide settling of large particles before stormwater runoff enters a stormwater quality control measure in order to reduce the long-term maintenance burden. Pretreatment should be provided to reduce the sediment load entering an infiltration trench in order to maintain the infiltration rate of the infiltration trench. To ensure that infiltration trenches are effective, the project applicant must incorporate pretreatment devices that provide sediment reduction (e.g., vegetated swales, vegetated filter strips, sedimentation manholes, and proprietary devices).

Setbacks

Infiltration trenches must be sited following the setbacks from the most recent GMED Policy GS 200.1.

Geometry

- Infiltration trenches must be designed and constructed to be at least 24 inches wide and 3 to 5 feet deep.
- The longitudinal slope of the trench should not exceed three percent.
- The filter bed media layers must have the following composition and thickness:
    - Top layer: 2 inches of pea gravel
    - Middle layer: 3 to 5 feet of washed 2- to 6-inch gravel; void spaces should be approximately 30 to 40 percent
    - Bottom layer: 6 inches of sand or geomembrane liner equivalent.

Sizing

Infiltration trenches are sized a simple sizing method where the SWQDv must be completely infiltrated within 96 hours. Infiltration trenches provide stormwater runoff storage in the voids of the rock fill or percolation tank modules.

<u>Step 1: Determine the SWQDv</u>

Infiltration trenches must be designed to capture and retain the SWQDv (see Section 6 for SWQDv calculation procedures).

<u>Step 2: Determine the design infiltration rate</u>

Determine the corrected in-situ infiltration rate (f_{design}) of the native soil using the procedures described in the most recent GMED Policy GS 200.1.

<u>Step 3: Calculate the surface area</u>

Determine the size of the required infiltration surface by assuming the SWQDv will fill the available void spaces of the gravel storage layer. The maximum depth of stormwater runoff that can be infiltrated within the maximum retention time (96 hrs) is calculated using the following equation:

$$d_{max} = \frac{f_{design}}{12} \times t$$

Where:

d_{max} = Maximum depth of water that can be infiltrated within the maximum retention time [ft];
f_{design} = Design infiltration rate [in/hr]; and
t = Maximum retention time (max 96 hrs) [hr].

Select the infiltration trench depth (d_t) such that:

$$d_t \leq \frac{d_{max}}{n_t}$$

Where:

d_t = Depth of infiltration trench [ft];
d_{max} = Maximum depth of water that can be infiltrated within the maximum retention time [ft]; and
n_t = Infiltration trench fill porosity.

Calculate the infiltrating surface area (bottom of the infiltration trench) required:

$$A = \frac{SWQDv}{d_t \times n_t}$$

Where:

A = Surface area of the bottom of the infiltration trench [ft^2];
SWQDv = Stormwater quality design volume [ft^3];
d_t = Depth of infiltration trench fill [ft]; and
n_t = Infiltration trench porosity.

Flow Entrance and Energy Dissipation

Energy dissipation controls, constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flow, must be installed at the inlet to the infiltration trench. Flow velocity at the inlet must be 4 ft/s or less. Consult with LACDPW for the type and design of energy dissipation structure.

Drainage

The specifications for designing drainage systems for infiltration trenches are presented below:

- The bottom of infiltration trench must be native soil that is over-excavated at least one foot in depth with the soil replaced uniformly without compaction. Amending the excavated soil with two to four inches (~15 to 30 percent) of coarse sand is recommended.

- The use of vertical piping, either for distribution or infiltration enhancement, is prohibited. This application may be classified as a Class V Injection Well per 40 CFR Part 146.5(e)(4).
- The infiltration capacity of the subsurface layers should be sufficient to ensure a maximum detention time of 96 hours. An observation well must be installed to allow observation of detention time.

Hydraulic Restriction Layer

The entire infiltrative area, including the side slopes must lined with a geomembrane liner to prevent soil from migrating into the top layer and reducing the infiltration capacity. The specifications of the geomembrane liner are presented in Table E-5. The entire trench area, including the sides, must be lined with a geomembrane liner prior to placing the media bed. Provide generous overlap at the seams.

Table E-5. Geomembrane Liner Specifications for Infiltration Trenches

Parameter	Test Method	Specifications
Material		Nonwoven geomembrane liner
Unit weight		8 oz/yd^3 (minimum)
Filtration rate		0.08 in/sec (minimum)
Puncture strength	ASTM D-751 (Modified)	125 lbs (minimum)
Mullen burst strength	ASTM D-751	400 lb/in^2 (minimum)
Tensile strength	AST D-1682	300 lbs (minimum)
Equiv. opening size	US Standard Sieve	No. 80 (minimum)

Observation Well

The observation well is a vertical section of perforated PVC pipe, four- to six-inch diameter, installed flush with the top of the infiltration trench on a footplate and with a locking, removable cap. The observation well is needed to monitor the infiltration rate in infiltration trench and is useful for marking the location of the infiltration trench.

Vegetation

- Infiltration trenches must be kept free of vegetation.
- Trees and other large vegetation should be planted away from infiltration trenches such that drip lines do not overhang the infiltration area.

Restricted Construction Materials

Use of pressure-treated wood or galvanized metal at or around an infiltration trench is prohibited.

Overflow Device

An overflow device must be provided in the event that stormwater runoff overtops the infiltration trench or if the infiltration trench becomes clogged. The overflow device must be able to convey stormwater runoff to a downstream conveyance system or other acceptable discharge point.

Maintenance Access

The infiltration trench must be safely accessible during wet and dry weather conditions if it is publicly-maintained. An access road along the entire length of the infiltration trench is required unless the trench is located along an existing road or parking lot that can be safely used for maintenance access. If the infiltration trench becomes plugged and fails, access is needed to excavate the infiltration trench and replace the filter bed media. All dimensions of the infiltration trench should also be increased by two inches to provide a fresh surface for infiltration. To prevent damage and compaction, access must able to accommodate a backhoe working at "arm's length" from the infiltration trench.

Maintenance Requirements

Maintenance and regular inspections are important for proper function of infiltration trenches. The following are general maintenance requirements:

- Conduct regular inspection and routine maintenance for pretreatment devices.
- Inspect infiltration trench and its observation well frequently to ensure that water infiltrates into the subsurface completely within the maximum detention time of 96 hours. If water is present in the observation well more than 96 hours after a major storm, the infiltration trench may be clogged. Maintenance activities triggered by a potentially clogged facility include:
    - Check for debris/sediment accumulation, rake surface and remove sediment (if any), and evaluate potential sources of sediment and vegetative or other debris (i.e., embankment erosion, channel scour, overhanging trees). If suspected upstream sources are outside of the County's jurisdiction, additional pretreatment (i.e., trash racks, vegetated swales) may be necessary.
    - Assess the condition of the top aggregate layer for sediment buildup and crusting. Remove the top layer of pea gravel and replace. If slow draining conditions persist, the entire infiltration trench may need to be excavated and replaced.
- Eliminate standing water to prevent vector breeding.
- Inspect infiltration trenches annually. Remove and dispose of trash and debris as needed, but at least prior to the beginning of the wet season.
- Inspect overflow devices for obstructions or debris, which should be removed immediately. Repair or replace damaged pipes upon discovery.

A summary of potential problems that may need to be addressed by maintenance activities is presented in Table E-6.

The County requires execution of a maintenance agreement to be recorded by the property owner for the on-going maintenance of any privately-maintained stormwater quality control measures. The property owner is responsible for compliance with the maintenance agreement. A sample maintenance agreement is presented in Appendix H.

Table E-6. Infiltration Trench Troubleshooting Summary

Problem	Conditions When Maintenance Is Needed	Maintenance Required
Trash and Debris	Trash and debris > 5 $ft^3/1,000\ ft^2$	Remove and dispose of trash and debris.
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove any evidence of visual contamination.
Erosion/Sediment Accumulation	Undercut or eroded areas at inlet structures	Repair eroded areas and re-grade if necessary.
	Accumulation of sediment, debris, and oil/grease in pretreatment devices	Remove sediment, debris, and/or oil/grease.
	Accumulation of sediment, debris, and oil/grease on surface, inlet or overflow structures	Remove sediment, debris, and/or oil/grease.
Water Drainage Rate	Standing water, or by inspection of observation wells	Remove the top layer of the infiltration trench bottom and replace if necessary.

ATTACHMENT

D. SOIL REPORT

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental, and Civil Engineering

June 11, 2015

Arroyo Development , LLC
2409 Strozier Avenue, suite A
South El Monte, California 91733

Attention: Mr. Frank Lac

Subject: Report of Geotechnical Engineering Investigation, Proposed 4-Story Residential Development, 235 S. Arroyo Drive, APN: 5346-011-004, San Gabriel, California. QCI Project No.: 14-010-024aGE

Gentlemen:

In accordance with your request, Quartech Consultants (QCI) has prepared this geotechnical engineering report for the proposed development at the subject site. The purpose of this report was to evaluate the subsurface conditions and to provide recommendations for foundation designs and other relevant parameters for the proposed construction.

Based on the findings and observations during our investigation, it is concluded that the subject site is suitable for its intended use from the geotechnical engineering viewpoint, provided that recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,
CalLand Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

Jack C. Lee, GE 2153
Principal

Abe Kazemzadeh
Project Engineer

Dist: (4) Addressee

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION AND

Proposed
4-Story Residential Development

At

APN: 5346-011-004
235 S. Arroyo Drive
San Gabriel, California

Prepared by

QUARTECH CONSULTANTS (QCI)

Project No.: 14-010-024aGE

June 11, 2015

TABLE OF CONTENT

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of our preliminary geotechnical engineering investigation for the proposed development at the subject site. The purposes of this investigation were to evaluate the subsurface conditions at the area of proposed construction and to provide recommendations pertinent to grading, foundation design and other relevant parameters.

1.2 Scope of Services

Our scope of services included the followings:

- Review of available soil and geologic data of the subject site and its vicinity.
- Subsurface exploration consisting of logging and sampling of two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing grade at the subject site. The exploration was logged by a QCI engineer. Boring logs are presented in Appendix A.
- Laboratory testing of representative samples obtained from the subject site to investigate engineering characteristics of the onsite soils. The laboratory test results are presented in Appendix B (Laboratory Testing) and on the boring logs (Appendix A).
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Preparation of this report to present our findings, conclusions, and recommendations for the proposed construction.

1.3 Proposed Construction

Based on the provided information, it is our understanding that the subject site will be developed for construction of a 46 condominium units. The main structure of the building is anticipated to be four stories in height above the ground level with one level of subterranean garage. The lowest garage floor will be approximately 10 feet below the existing ground surface. The subterranean garage will occupy the entire building site. No detail design structural loads were available at the time when this report was prepared.

1.4 Site Location

The project site is located at the west of Arroyo Drive and Alhambra Wash, between southwest Hampton Court and northeast Vega street in the City of San Gabriel, California. The approximate location of the site is presented in the attached Site Location Map (Figure 1). The existing drainage channel "Alhambra Wash" is located east of the site and west of Arroyo Drive. Detailed configuration of the site is presented in the attached Site Plan, Figure 2.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration

Our subsurface exploration consisted of excavating two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing ground surface at the subject site. Approximate locations of the borings are shown on the attached Site Plan (Figure 2). The purpose of the explorations was to assess the engineering characteristics of the onsite soils with respect to the proposed development.

The borings were logged by a representative of this office. Relatively undisturbed and bulk samples were collected during drilling for laboratory testing. Natural soil was encountered in the borings to the depths explored. Boring logs are presented in Appendix A.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, consolidation, direct shear strength, Atterberg Limits, percent fines, expansion and corrosion potential. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are provided on the boring logs (Appendix A).

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Soil Conditions

The onsite near surface soils consist predominantly of silty sand (SM). In general, these soils exist in medium dense and slightly moist condition. Underlying the surface soils, silty sand (SM), and sand/silty sand mixtures (SP-SM), were disclosed in the borings to the depths explored (51.5 feet below the existing ground surface). These soils exist in the slightly moist to moist conditions. The soils become denser as depth increases.

3.2 Groundwater

No groundwater was encountered in the borings to the depths explored (51.5 ft.). Based on our review of the "Historically Highest Ground Water Contours and Borehole Log Data Locations, El

Monte Quadrangle", by CDMG, it is estimated that the highest ground water level is approximately 140 to 150 feet below the existing grade. It should be noted that the CDMG ground water map is obtained by evaluating technical publications, geotechnical borehole data, water-well logs dating back to the "turn-of-the-century". This report also indicated that ground water levels in the areas from 1960-1997 data are generally 5 to 50 feet deeper than the earlier measured data. No specific date was provided pertaining to the high ground water level.

4.0 SEISMICITY

4.1 Faulting

Based on our study, there are no known active faults crossing the property. The nearest known active regional fault is the Raymond Fault zones located approximately 1.6 miles from the site.

4.2 Seismicity

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting the site depend on the distance to causative faults, the intensity, and the magnitude of the seismic event. Table 1 indicates the distance of the fault zones and the associated maximum magnitude earthquake that can be produced by nearby seismic events. As indicated in Table 1, the Raymond Fault zones are considered to have the most significant effect to the site from a design standpoint.

TABLE 1

Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (mile)	Maximum Magnitude Earthquake (Mw)
Raymond	1.6	6.8
Elysian Park (Upper)	2.3	6.7
Verdugo	3.2	6.9
Sierra Madre	5.8	7.2
Hollywood	6.9	6.7
Elsinore-W	8.1	7.0
Clamshell-Sawpit	8.4	6.7
Puente Hills (LA)	9.1	7.0
Santa Monica	9.9	7.4
Puente Hills (Santa Fe Spring)	12.7	6.7
San Jose	14.0	6.7
Puente Hills (Coyote Hills)	14.8	6.9
Newport-Inglewood,Conn. alt 2	15.8	7.5

References: 2008 National Seismic Hazard Maps-Source Parameters

4.3 Estimated Earthquake Ground Motion

In order to estimate the seismic ground motions at the subject site, QCI has utilized the seismic hazard map published by California Geological Survey. According to this report, the peak ground alluvium acceleration at the subject site for a 2% and 10% probability of exceedance in 50 years is about 1.034g and 0.595g respectively (NSHMP, 2008 Deaggregation of Seismic Hazards).

5.0 CONCLUSIONS

Based on the results of our subsurface investigation, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction. The following is a summary of the geotechnical design and construction factors that may affect the development of the site:

5.1 Seismicity

Based on our studies on seismicity, there are no known active faults crossing the property. However, the site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California.

5.2 Seismic Induced Hazards

Based on our review of the "Seismic Hazard Zones, El Monte Quadrangle" by California Department of Conservation, Division of Mines and Geology, it is concluded that the site is not located in the mapped potential liquefaction areas.

5.3 Excavatability

Based on our subsurface investigation, excavation of the subsurface materials should be accomplished with conventional earthwork equipment.

5.4 Surficial Soil Removal

The near surface soils are relatively dry and vary in density. In order to provide a uniform support for the foundation, it is recommended the existing soil be removed and backfilled with compacted fill to a minimum depth of 4 feet below the existing grade to provide a uniform support of the structures.

5.5 Groundwater

Groundwater was not encountered during our field exploration. Groundwater is not anticipated to be encountered during the near surface construction.

6.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

6.1 Grading

6.1.1 Site Preparation

Prior to initiating grading operations, any existing vegetation, trash, debris, over-sized materials (greater than 8 inches), and other deleterious materials within construction areas should be removed from the subject site.

6.1.2 Surficial Soil Removals

It is anticipated that most unsuitable or and loose near surface soils will be removed by excavation for the subterranean parking structures. It is recommended that the subterranean garage areas be cut to grade then observed by a representative of this office to verify the sub-grade soil conditions. Outside the building areas, the near surface soils are loose and weathered and should be removed to expose competent natural soils.

6.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to minimum project standards.

6.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. Fills should be placed in relatively thin lifts (6 to 8 inches), brought to near optimum moisture content, and compacted to at least 90 percent relative compaction based on laboratory standard ASTM D-1557-09.

6.2 Subterranean Garage Excavation

The required excavation for the proposed subterranean garage will extend to a maximum of approximately 10 to 12 feet below the existing ground surface. The excavation will have minor impact to the adjacent structures. The criteria for sloped excavations and/or shoring method for the alignments required vertical cuts, depends on many factors, which include depth of excavation, soil conditions, types of shoring, distance to the existing structures or public improvement, consequences of potential ground movement, and construction procedures.

6.2.1 Sloping Excavation

Should the space be available at the site, the required excavation may be made with sloping banks. Based on materials encountered in the test borings, it is our opinion that sloped excavations may be made no steeper than 3/4:1 (horizontal to vertical) for the underlying native soils. Flatter slope cuts may be required if loose soils encountered during excavation. No heavy construction vehicles, equipment, nor surcharge loading should be permitted at the top of the slope. A representative of this office should inspect the temporary excavation to make any necessary modifications or recommendations.

6.2.2 Shoring

Shoring will be required for temporary excavation made vertically or near vertically. An active earth pressure of 26 pound per cubic foot may be used for the temporary cantilever shoring system. Any surcharged loads resulting from the adjacent building or the traffic in the adjacent street or alley should be considered as an added loads to the above recommended. The upper 10 feet of the shoring is recommended to be designed to resist an additional pressure of 200 pounds per square ft. resulting from the traffic in the adjacent street. Soldier piles or beams should be spaced at the required distance specified by the project structural/shoring engineer. Lagging may be required to span between soldier piles to support the lateral earth pressure.

The shoring and bracing should be designed and constructed in accordance with current requirements of CAL/OSHA and all other public agencies having jurisdiction. Careful examination of the soil excavation and inspection of on-site installation of the shoring system by a representative of this office is recommended to verify the conditions or to make recommendations as are pertinent if different conditions are disclosed during excavation.

6.3 Foundation Design

Based on our subsurface investigation, it is our opinion that the proposed building may be supported on shallow foundation. For fill composed of the onsite soil materials and graded in accordance with the recommendations of this report, construction of concrete slab-on-grade with conventional shallow foundation structures is feasible from the geotechnical engineering viewpoint. The following presents our preliminary recommendations:

6.3.1 Conventional Shallow Foundation

An allowable bearing value of 2000 pounds per square foot (psf) may be used for design of continuous or pad footings with a minimum of 18 or 24 inches in width, respectively. All footings should be a minimum of 18 inches deep and founded on soils approved by the project geotechnical engineer. This bearing value may be increased by 200 psf for each additional foot of depth or width to a maximum value of 2500 psf. This value may be increased by one third (1/3) when considering short duration seismic or wind loads.

Resistance to the lateral loads can be assumed to be provided by the passive earth pressure and the friction between the concrete and competent soils. Passive earth pressure may be computed as an equivalent fluid pressure of 300 pcf, with a maximum earth pressure of 2000 psf. An allowable coefficient of friction between soil and concrete of 0.30 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3).

6.3.2 Lateral Pressures

Active earth pressure from horizontal backfill may be computed as an equivalent fluid weighting of 35 pounds per cubic foot for cantilever retaining wall and 60 pcf for restrained retaining wall. This value assumes free-draining conditions.

The effect of surcharge, such as traffic loads, adjacent building loads, and etc. within a 1 to 1 projection from the inner edge of the foundation should be included in the design of the retaining walls. For a uniformly disturbed load behind the wall, a corresponding uniformly distributed lateral soil pressure equal to 30 percent of the surcharged should be added to the equivalent fluid pressure.

6.3.3 Seismic Loading

Active earthquake earth pressure distribution on retaining walls retaining more than 6 feet of soils when the slope of the backfill behind the wall is level may be computed as an inverted right triangle with 32H psf at the top (where H is the height of the walls). The earthquake induced earth pressure may be applied as an inverted triangle (inverted equivalent fluid pressure) with largest dynamic earth pressure occurring at the top of the wall (upper ground surface). Resultant seismic earth force may be applied at approximately 0.6xH from the bottom of the wall.

6.4 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. The following presented our recommendations for the foundation construction.

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. All footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings.

6.5 Concrete Slab

Concrete slab should be founded on properly placed compacted fill or competent natural soils approved by the project geotechnical consultant. All disturbed soils within the concrete slab areas should be removed to exposed competent natural soils then backfill with compacted fills to the design grade. Concrete slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 reinforcing bar spaced 18-inch each way or its equivalent. All slab reinforcement should be supported to ensure proper positioning during placement of concrete.

In order to comply for the moisture sensitive area with the requirements of the 2013 CalGreen Section 4.505.2.1, a minimum of 4-inch thick base of ½ inch or larger clean aggregate should be provided with a vapor barrier in direct contact with concrete. A 10-mil Polyethylene vapor retarder, with joints lapped not less than 6 inches, should be placed above the aggregate and in direct contact with the concrete slab. The above foundation and concrete flatwork reinforcement recommendations are presented in accordance with the geotechnical engineering viewpoint. Additional reinforcement may be required in the concentrated column and/or traffic loading areas. Final reinforcement should be designed by the project structural engineer.

6.6 Retaining Wall Drainage

Walls should be backfilled with compacted fill. A free-drainage, selected backfill materials (Sand Equivalent of 30 or greater), at least 2 feet wide should be used against the wall. Onsite soil materials should be used for the upper 18 inches of the wall backfill.

A drainage system should be placed around the perimeter of the foundation or the basement walls. The system should be consist of a four-inch diameter perforated ABS SDR-35 or PVC Schedule 40, and similar non-perforated outlet pipe. The perforated portion of the pipe should be embedded in at least one cubic foot per linear foot of 3/4 inch crushed rock or its equivalent and wrapped in filter fabric. The installation of the subdrainage system should be observed by the project geotechnical engineer. The bottom of the recommended drainage system should not be higher than the bottom of the base under the basement floor. The subdrain pipe should discharge by gravity or mechanical means into the approved drainage system that compiled with the current plumbing code in accordance with the current City Building Code. Specific gradients, pipe routing and outlet locations, should be designed by the project civil engineer.

6.7 Temporary Excavation and Backfill

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-09. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

7.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction.
- Utility trench backfill.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

8.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in southern California, which is a tectonically active area. Based on ASCE 7 –10 Standard (CBC 2013), the following seismic related values may be used:

Seismic Parameters (Latitude: 34.099906, Longitude:-118.113176)	
Mapped 0.2 Sec Period Spectral Acceleration **S_S**	2.806g
Mapped 1.0 Sec Period Spectral Acceleration **S_1**	0.928
Site Coefficient for Site Class "D", **F_a**	1.0
Site Coefficient for Site Class "D", **F_v**	1.5
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 0.2 Second, **S_{MS}**	2.806
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 1.0 Second, **S_{M1}**	1.392
Design Spectral Response Acceleration Parameters for 0.2 sec, **S_{DS}**	1.871
Design Spectral Response Acceleration Parameters for 1.0 Sec, **S_{D1}**	0.928

The Project Structural Engineer should be aware of the information provided above to determine if any additional structural strengthening is warranted.

9.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. The testing results are presented in Appendix B.

According to CBC and ACI 318-11, a "negligible" exposure to sulfate can be expected for concrete placed in contact with the onsite soils. Therefore, Type II cement or its equivalent may be used for this project. Based on the resistivity test results, it is estimated that the subsurface soils are moderately corrosive to buried metal pipe. It is recommended that any underground steel utilities be blasted and given protective coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

10.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction, which appear to be different from those disclosed by the exploratory work, this office should be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

11.0 REFERENCES

California Division of Mines and Geology, 1998, Seismic Hazard Zone Report for the El Monte 7.5-minutes Quadrangle, Los Angeles County, California Seismic Hazard Zone report 024.

www.conservation.ca.gov/cgs/rghm/psha/fault_parameters/pdf/Documents/B_flt.pdf
https://geohazards.usgs.gov/deaggint/2008/
http://eqint.cr.usgs.gov/deaggint/2008/index.php
http://earthquake.usgs.gov/research/software/
http://earthquake.usgs.gov/hazards/qfaults/
"http://geohazards.usgs.gov/deaggint/2008/Earthquake Hazards Program, Seismic Design Maps and tools", ASCE 7-10 Standard
http://www.conservation.ca.gov/cgs/shzp/pages/index.aspx

APPENDIX A
FIELD INVESTIGATION

Subsurface conditions were explored by drilling two 8-inch diameter hollow stem auger borings to a maximum depth of 51.5 feet below the existing grade at the subject site. The approximate boring location is shown on the enclosed Site Plan, Figure 2.

The drilling of the boring was supervised by a QCI's engineer, who continuously logged the borings and visually classified the soils in accordance with the Unified Soil Classification System. Ring and SPT samples were taken at frequent intervals. These samples taken from hollow stem drilling rig were obtained by driving a sampler with successive blows of 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

APPENDIX B
LABORATORY TESTING

During the subsurface exploration, QCI personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.010 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of two kilo-pounds (kips) per square foot, and the test results are shown on the attached Figures.

Corrosion Potential

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. These tests are performed in accordance with California Test Method 417, 422, 532, and 643. The testing results are presented below:

Sample Location	PH	Chloride (ppm)	Sulfate (% by weight)	Min. Resistivity (ohm-cm)
B-1 @ 0-5'	6.79	164	0.0010	4,600

Expansion Index

Expansion Index tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation. These tests are performed in accordance with ASTM D-4829. The testing results are presented below:

Sample Location	Expansion Index	Expansion Potential
B-1 @ 0-5'	3	Very Low

Percent Passing #200 Sieve

Percent of soil passing #200 sieve were determined for selected soil samples in accordance with ASTM D1140 standard. The test results are presented in the following table:

Sample Location	% Passing #200
B-1 @ 5'	27.2
B-1 @ 10'	10.8
B-1 @ 15'	35.6
B-1 @ 20'	38.2
B-1 @ 25'	14.3
B-1 @ 30'	47.7
B-1 @ 35'	30.6
B-1 @ 40'	14.9
B-1 @ 45'	8.5
B-1 @ 50'	10.8

Atterberg Limits

Laboratory Atterberg Limits tests were conducted on the existing onsite materials sampled during QCI's field investigation to aid in evaluation of soil liquefaction potential. These tests are performed in accordance with ASTM D4318. The testing results are presented below:

Sample Location	USCS Class. ASTM D2488	Liquid Limit %ASTM D4318	Plastic Limit %ASTM D4318	Plasticity Index %ASTM D4318	% Passing #200
B-1 @ 15'	SM	25	NP	NP	35.6

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental, and Civil Engineering

June 28, 2016

Arroyo Development, LLC
2409 Strozier Avenue Ste A
South El Monte, California 91733

Attention: Mr. Frank Lac

Subject: Percolation Feasibility Testing for the Proposed Infiltration System, 235 S. Arroyo Drive, APN: 5346-011-001, San Gabriel, California
QCI Project No.: 14-010-024b

References: County of Los Angeles, Department of public works, 2014, Guidelines for Design, Investigation and Reporting, Low Impact Development Stormwater Infiltration, dated June 30, 2014.

"Report of Geotechnical Engineering Investigation, Proposed 4-Story Residential Development, 235 S. Arroyo Drive, APN: 5346-011-004, San Gabriel, California". QCI Project No.: 14-010-024aGE, dated June 11, 2015

Gentlemen:

As requested and authorized, CalLand Engineering, Inc. (CLE) has performed a feasibility percolation evaluation for the above subject site located at the subject site.

The purpose of this report is to aid in the design and construction of the required storm water infiltration system. The professional opinions and geotechnical information contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our study is limited to the area explored, which is shown on Figure 2, (Site Plan).

SITE CONDITIONS

The project site is located at the west of Arroyo Drive and Alhambra Wash, between southwest Hampton Court and northeast Vega Street in the City of San Gabriel, California. The approximate location of the site is presented in the attached Site Location Map (Figure 1). The existing drainage channel "Alhambra Wash" is located east of the site and west of Arroyo Drive. Detailed configuration of the site is presented in the attached Site Plan, Figure 2.

PROPOSED DEVELOPMENT

Based on the provided information, it is our understanding that the subject site will be developed for construction of a 24 condominium units. The main structure of the building is anticipated to be four stories in height above the ground level with one level of subterranean garage. The lowest garage floor will be approximately 10 feet below the existing ground surface. The subterranean garage will occupy the entire building site. No detail design structural loads were available at the time when this report was prepared.

FIELD EXPLORATION

Field exploration for this investigation consisted of drilling three percolation borings (P-1, P-2 and P-3) to the depth of 5.0 to 12.0 feet below existing site grade (depth corresponds to the bottom the proposed of infiltration system) and two additional borings to the maximum depth of 51.5 feet below the existing grade. Approximate boring locations are presented on Figure 2, Site Plan

Description of the soil materials encountered during drilling was entered into the boring logs in accordance with the Unified Soil Classification System (USCS) and Hydraulic Soil Group (HSG). The boring logs are included in Appendix A.

SUBSURFACE CONDITION

The onsite near surface soils consist predominantly of silty sand (SM). In general, these soils exist in medium dense and slightly moist condition. Underlying the surface soils, silty sand (SM), and sand/silty sand mixtures (SP-SM), were disclosed in the borings to the depths explored (51.5 feet below the existing ground surface). These soils exist in the slightly moist to moist conditions. The soils become denser as depth increases.

GROUNDWATER

Ground water level was not encountered during our subsurface. Based on our review of the "Historically Highest Ground Water Contours and Borehole Log Data Locations, El Monte Quadrangle", by CGS (previously CDMG, 1997, Open File Report 98-15), it is estimated that the historically highest ground water level is about 130 to 150 feet in the vicinity of the site. It should be noted that the CGS ground water map is obtained by evaluating technical publications, geotechnical borehole data, water-well logs dating back to the "turn-of-the-century". This report indicated that ground water levels in the areas from 1960-1997 data are generally 5 to 50 feet deeper than the earlier measured data. No specific date was provided pertaining to the high ground water level.

LABORATORY TESTING

Representative samples were tested for the following parameters: in-situ moisture content and density. In-situ moisture and density test results are presented on the boring logs in Appendix A.

Laboratory testing including Expansion Potential and Mechanical Analysis were performed on selective soil samples:

EXPANSION INDEX

Laboratory Expansion Index test was conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil expansion potential. The test is performed in accordance with ASTM D-4829. The testing result is presented below:

Sample Location	Expansion Index	Expansion Potential
B-1 @ 0 - 5'	3	Very Low

PARTICLE-SIZE ANALYSIS & PERCENT PASSING #200 SIEVE

Particle-size analyses were determined for selected soil samples in accordance with ASTM D442 standard. The results were plotted and presented in appendix C. Percent of soil passing #200 sieve were determined for selected soil samples in accordance with ASTM D1140 standard. The test results are presented in the following table:

Sample Location	% Passing #200
P-1 @ 10'	10.9
P-2 @ 12'	12.7
P-3 @ 5'	8.0

PERCOLATION RATE/ PERMEABILITY

Percolation rate and permeability of the subsurface material, encountered in Test Pits P-1 and P-2, within the zone of approximately 10 to 12 feet below existing grade was measured by performing a constant head test. The limit of excavation was within the zone of approximately 10-12 feet below existing grade. The test pit trenches were excavated by utilizing bobcat excavator to the desire test depth. A 12" wide x 12" long x 12" deep wired cage were inserted into the bottom of the excavated trench at the elevation proposed invert of infiltration. In both test pits for presoak, water was added at least 12 inches above the bottom of excavation.

Percolation rate and permeability of the subsurface material, encountered in Borings P-3, within the zone of approximately 5 feet below existing grade was measured by performing a constant head test. The 8-inch diameter borings were excavated by utilizing 8-inch diameter hollow stem auger. P-3 was drilled and a 3-inches diameter perforated PVC pipe casing with a solid end cap was installed in the boring after the completion of the drilling. Gravelly filter materials were placed between the PVC pipe and the drill hole.

The test trench/borings were pre-saturated prior to testing and the readings were taken on June 27, 2016. In all three holes for presoak, water was added at least 12 inches above the bottom of the excavated trench and PVC end cap. However, the water seeps away completely within 30 minutes after filling the holes with two consecutive times, the presoak was considered completed and the rate of surface water drop was measured every 10 minutes and testing stopped after a minimum of eight readings and after noticing a stabilized rate of drop was obtained. Upon completion of tests, the borings were backfilled with the soil cuttings.

Numerous measurements recorded within the test period indicated an average percolation rate of 25.50 inch/hour for P-1, 19.50 inch/hour for P-2, and 31.68 inch/hour for P-3. The results of percolation test for Test pits P-1 and P-2 and P-3 provided in Appendix B. The percolation rate was reduced and readjusted to account for the discharge of water from both the sides and bottom of boring (i.e., non-vertical flow). The following formula was used to determine the infiltration rates:

Reduction Factor (Rf) = $\frac{(2d1-\Delta d)}{DIA} + 1$

Where:

Δd = Water level drop of the final period of stabilized rate (in)
DIA = Diameter of boring (in)
Infiltration Rate = Pre-adjusted Percolation Rate divided by Reduction Factor

P-1, Reduction Factor (Rf) = $\frac{(2d1-\Delta d)}{DIA} + 1$ or $\frac{(2 \times 12)-4.25}{13.5} + 1 = 2.463$

P-2, Reduction Factor (Rf) = $\frac{(2d1-\Delta d)}{DIA} + 1$ or $\frac{(2 \times 12)-3.25}{13.5} + 1 = 2.537$

P-3, Reduction Factor (Rf) = $\frac{(2d1-\Delta d)}{DIA} + 1$ or $\frac{(2 \times 12)-5.28}{8} + 1 = 3.340$

The site is underlain by relative uniform of alluvial deposits of silty sand. It is our understanding that stormwater infiltration BMPs with pretreatment components and regular maintenance programs will be implement. The following presents the calculations of the recommended infiltration rate for the onsite stormwater system

Total Correction Factor CF = Rf x CFv x CFs

Boring P-1
Design Infiltration Rate = 25.50 / (2.463x3x2) = 1.73 in/hr

Boring P-2
Design Infiltration Rate = 19.50 / (2.537x3x2) = 1.28 in/hr

Boring P-3
Design Infiltration Rate = 31.68 / (3.340x3x2) = 1.58 in/hr

CONCLUSIONS AND RECOMMENDATIONS

Our review and analysis of collected data and percolation testing indicate that the proposed infiltration system is feasible from geotechnical viewpoint and permeability rates exceed the required minimum 0.3 inch/hour for onsite soils. It is our opinion that the infiltration rate of 1.28 inch/hour may be used for the design of the onsite infiltration.

LIMITATIONS

Soil materials vary in character between excavations. Site conditions may vary due to seasonal changes or other factors. Therefore, we assume no responsibility or liability for work, testing or recommendations performed or provided by others. Site geotechnical or environmental factors, are not part of the scope of this work.

Since our study is based upon the site materials observed, engineering research and analyses, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to call our office.

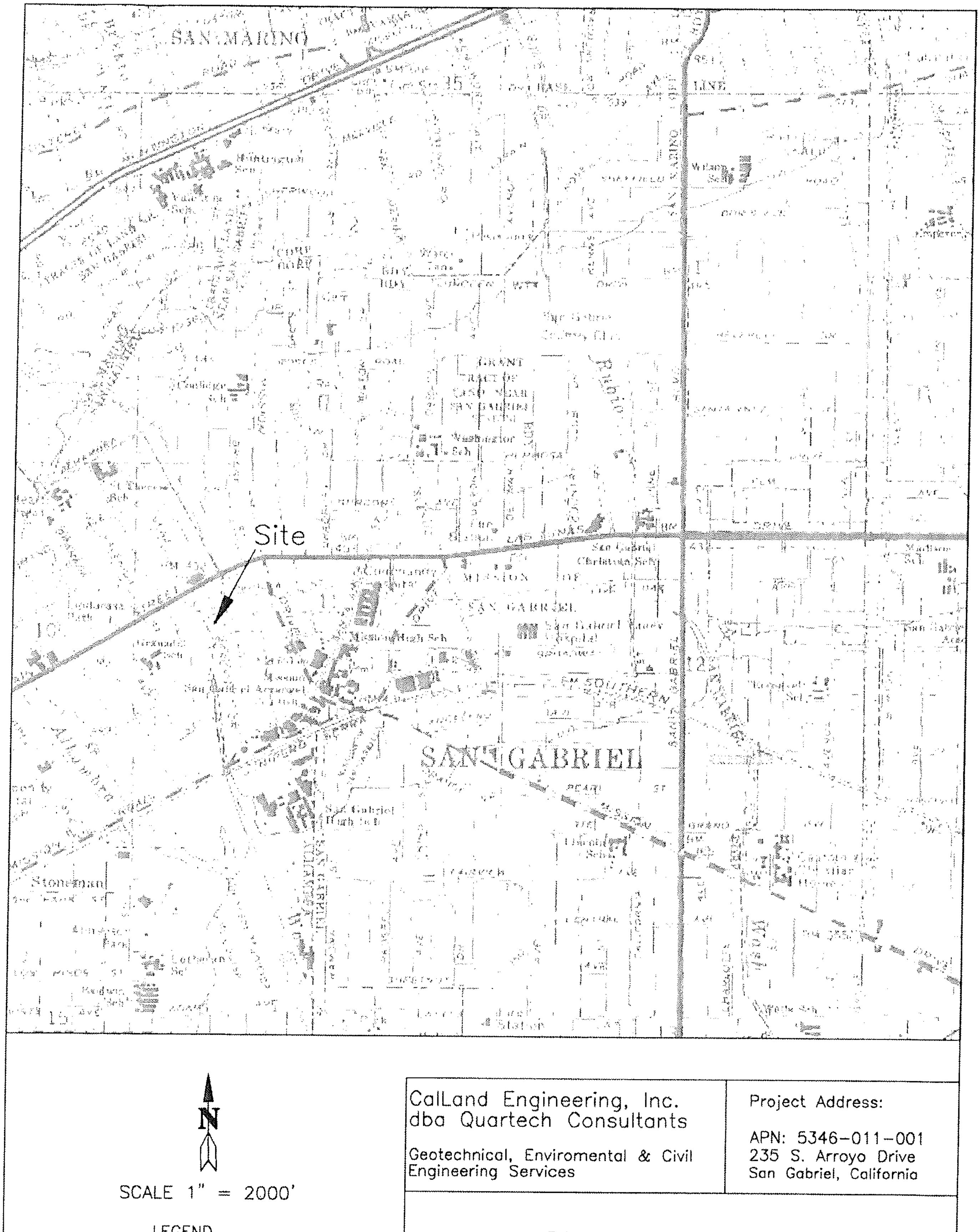
Very truly yours,
CAL LAND ENGINEERING, INC.
dba QUARTECH CONSULTANTS

Jack C. Lee, GE 2153
Principal

Keith Au
Project Engineer

Abe Kazemzadeh

Enclosures:
Figure 1 - Site Location Map
Figure 2 - Site Plan (Boring Location Map)
Appendix A - Boring Logs
Appendix B - Percolation Test Results
Appendix C -Sieve Analysis
Dist: (4) Addressee;



LEGEND

by CDMG
Maps modified from "Seismic Hazard Zones, El Monte Quadrangle"

CalLand Engineering, Inc.
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Geotechnical, Enviromental & Civil Engineering Services

Project Address:

APN: 5346-011-001
235 S. Arroyo Drive
San Gabriel, California

Site Location Map

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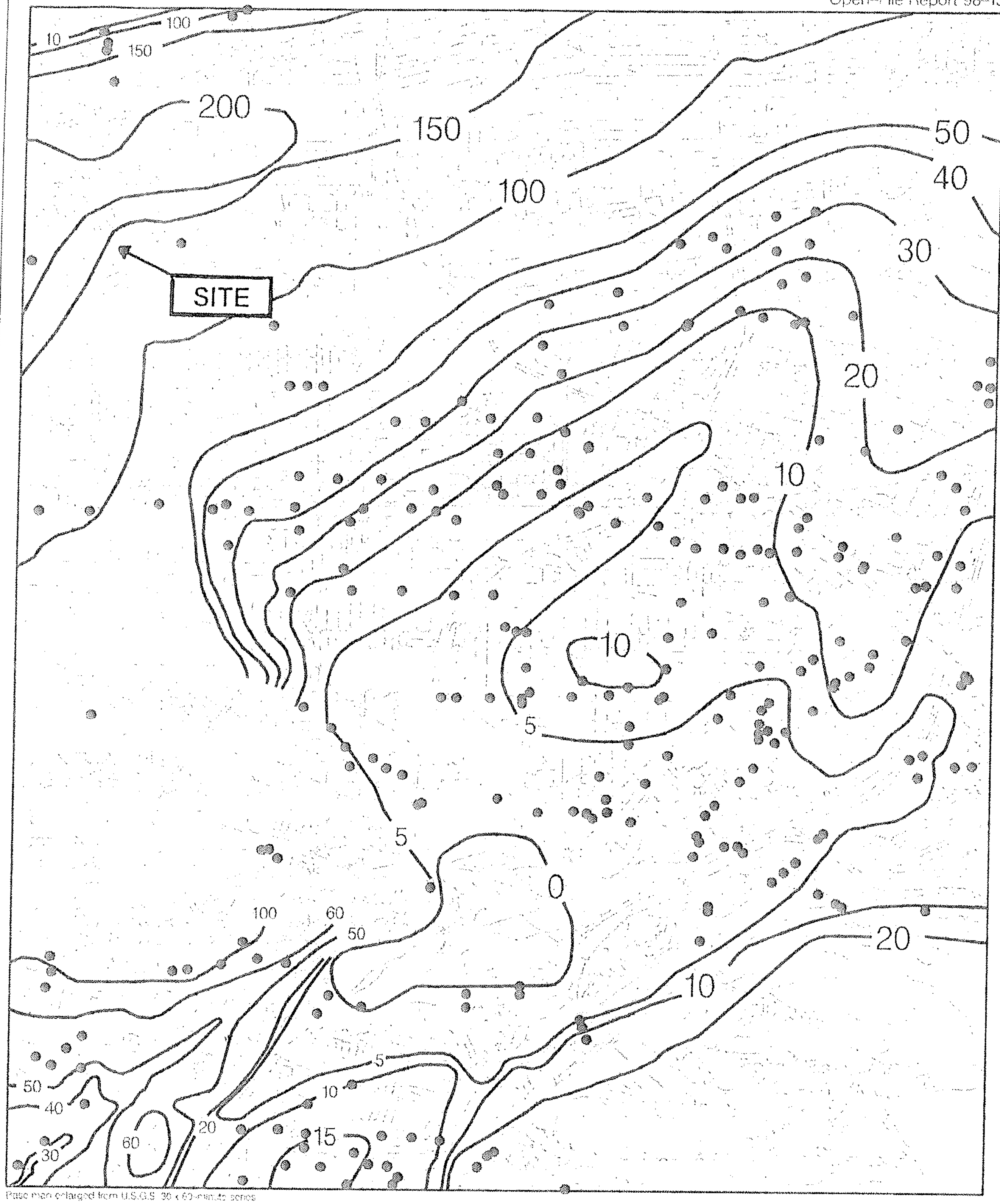
FIGURE 1



Base map enlarged from U.S.G.S. 30 x 60-minute series

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations. El Monte Quadrangle.

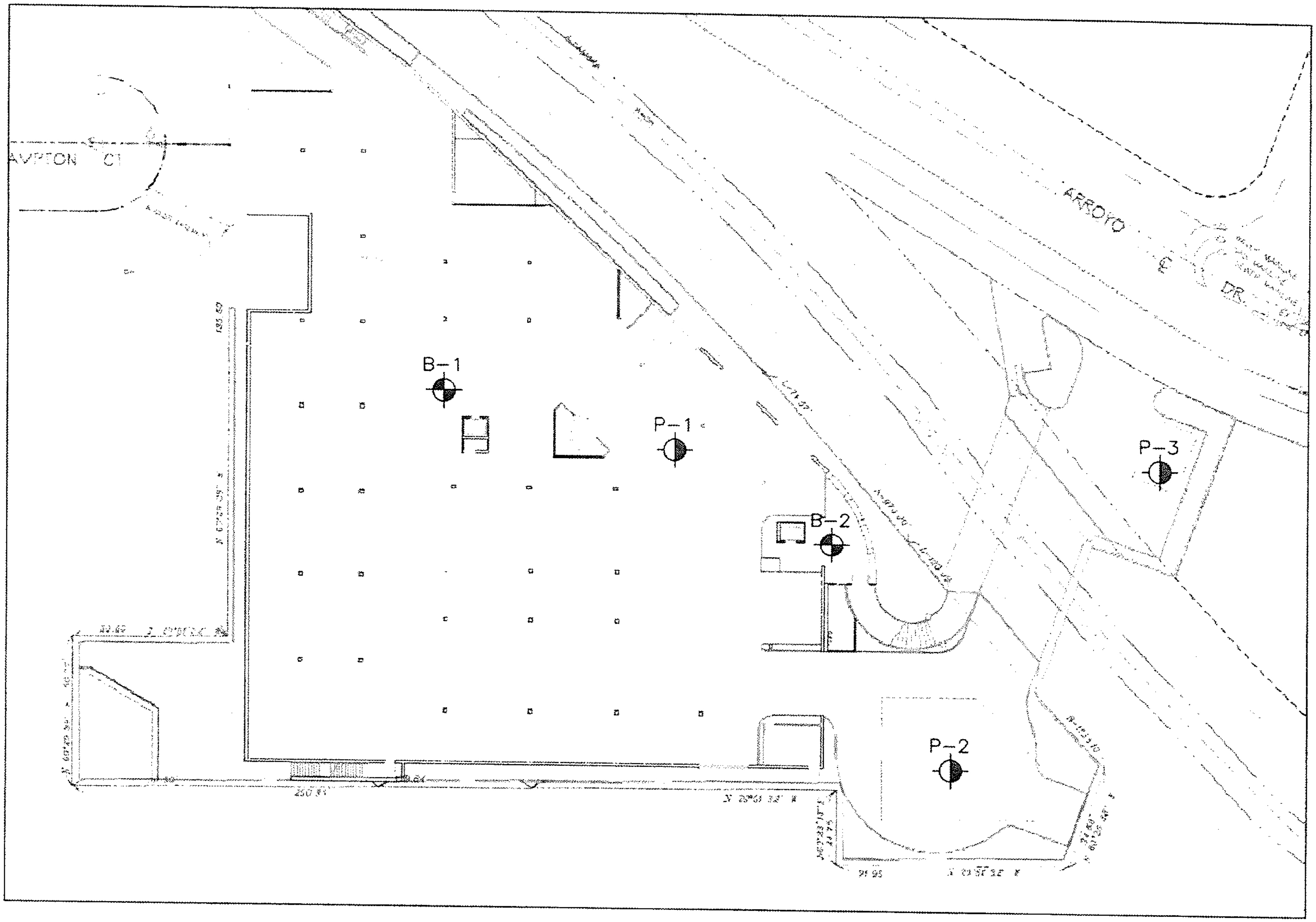
● Borehole Site

30 Depth to ground water in feet

ONE MILE

SCALE

Fig 1A



LEGEND

B-1 Approxmiate boring location

P-1 Approxmiate percolation location

SCALE 1" = 50'

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SITE PLAN

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FIGURE 2

Appendix A

Boring Logs

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BORING LOG B-1

PROJECT LOCATION: 235 S. Arroyo Drive, San Gabriel, California

PROJECT NO: 14-010-024

DATE DRILLIED: 5-7-15

SAMPLE METHOD: Hollow Stem

ELEVATION: N/A

LOGGED BY: KA

S: Standard Penetration Test

R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
	Bag			SM		3.0	Silty sand, fine grained, medium brown, slightly moist, medium dense
		R	14 15 20	SM	115.1	3.3	Silty sand, fine grained, medium brown, slightly moist, medium dense
5		R	10 10 18	SM	96.7	6.5	Silty sand, fine grained, medium brown, slightly moist to moist, medium dense percent of fines=27.2%
10		S	10 14 20	SP/ SM		2.3	Sand and silty sand, medium grained, light to tan brown, slightly moist, dense percent of fines=10.8%
15		R	30 50 50/5"	SM	96.2	5.9	Silty sand, fine grained, yellowish brown, slightly moist to moist, very dense percent of fines=35.6%
20		S	15 16 21	SM		8.4	Silty sand, fine grained, yellowish brown, moist, dense percent of fines=38.2%
25		R	40 40 50/5"	SM	107.0	4.0	Silty sand, fine grained, light to tan brown, slightly moist, very dense percent of fines=14.3%
30		S	30 33 40	SM		15.0	Silty sand, fine grained, medium brown, moist to very moist, very dense percent of fines=47.7%
35		S	25 48 50/5	SM		15.7	Silty sand, medium grained, medium brown, moist to very moist, very dense percent of fines=30.6%

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BORING LOG B-1

PROJECT LOCATION: 235 S. Arroyo Drive, San Gabriel, California

PROJECT NO: 14-010-024

DATE DRILLIED: 5-7-15

SAMPLE METHOD: Hollow Stem

ELEVATION: N/A

LOGGED BY: KA

S: Standard Penetration Test

R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
		S	45 50 50/5	SM		2.4	Silty sand, medium grained, light brown, slightly moist, very dense percent of fines=14.9%
45		S	50 50/5"	SP/ SM		3.6	Sand and silty sand, fine grained, kight brown, slightly moist, very dense percent of fines=8.5%
50		S	50 50/4"	SP/ SM		3.2	Sand and silty sand, medium grained, light brown, slightly moist, very dense percent of fines=10.8%
55							
60							Total depth 51.5 ft. No groundwater Hole backfilled Hammer Driving Weight: 140 lbs Hammer Driving Height: 30 inches
65							
70							
75							

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BORING LOG B-2

PROJECT LOCATION: 235 S. Arroyo Drive, San Gabriel, California

PROJECT NO: 14-010-024

DATE DRILLIED: 5-7-15

SAMPLE METHOD: Hollow Stem

ELEVATION: N/A

LOGGED BY: KA

S: Standard Penetration Test

R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
		R	5 13 15	SP/ SM	105.7	3.9	Sand and silty sand, medium grained, medium brown, slightly moist, medium dense, with some grave gravel
5		R	20 20 25	SP/ SM	96.7	6.5	Sand and silty sand, fine grained, medium brown, slightly moist to moist, medium dense to dense
10		R	13 18 21	SP/ SM	116.8	1.6	Sand and silty sand, medium grained, light to tan brown, slightly moist, dense
15		S	15 15 18	SM		8.4	Silty sand, fine grained, yellowish brown, moist, dense
20		R	25 42 50	SM	106.3	3.6	Silty sand, fine grained, light brown, slightly moist, very dense
25		S	20 20 20	SM		11.4	Silty sand, fine grained, medium brown, moist, dense
30							Total depth 26.5 ft. No groundwater Hole backfilled Hammer Driving Weight: 140 lbs Hammer Driving Height: 30 inches
35							

Appendix B

Percolation Test Results

Boring/ Excavation Percolation Test Field Log

Project Location:	235 S. Arroyo Drive San Gabriel, CA	Boring/ Test Number	P-1		
Earth Description	Alluvium	Diameter of Boring	EQU 13.5"	Diameter of Casing	12"x12"
Test By	D.T.	Depth of Boring		10'	
Liquid Description	Tap Water	Depth of Invert of BMP		5-12'	
Measurement Method	Sounder	Depth of Water Table		N/A	
		Depth of Initial Water Depth (d1)		12"	

Time Interval Standard			
Start Time for Pre-Soak	10:00 AM	Water Remaining In Boring (Y/N)	No
Start Time for Standard	11:30 AM	Standard Time Interval Between Readings	10 Mins

Reading Number	Time Start/ End (hh:mm)	Elapsed Time Δtime (mins)	Water Drop During Standard Time Interval Δtime (inches)	in/hr Percolation Rate for Reading	Soil Description / Notes / Comments
1	11:30 AM 11:40 AM	10	6.75	40.50	Light brown, silty sand
2	11:40 AM 11:50 AM	10	5.63	33.78	Hydrologic Soil Group A
3	11:50 AM 12:00 PM	10	6.25	37.50	
4	12:00 PM 12:10 PM	10	5.83	34.98	
5	12:10 PM 12:20 PM	10	5.00	30.00	
6	12:20 PM 12:30 PM	10	4.70	28.20	
7	12:30 PM 12:40 PM	10	4.33	25.98	
8	12:40 PM 12:50 PM	10	4.25	25.50	Stabilized Rate Archieved

Boring/ Excavation Percolation Test Field Log

Project Location:	235 S. Arroyo Drive San Gabriel, CA	Boring/ Test Number	P-2
Earth Description	Alluvium	Diameter of Boring	EQU 13.5"
		Diameter of Casing	12"x12"
Test By	D.T.	Depth of Boring	12'
Liquid Description	Tap Water	Depth of Invert of BMP	5-12'
Measurement Method	Sounder	Depth of Water Table	N/A
		Depth of Initial Water Depth (d1)	12"
Time Interval Standard			
Start Time for Pre-Soak	10:15 AM	Water Remaining In Boring (Y/N)	No
Start Time for Standard	11:45 AM	Standard Time Interval Between Readings	10 Mins

Reading Number	Time Start/ End (hh:mm)	Elapsed Time Δtime (mins)	Water Drop During Standard Time Interval Δtime (inches)	in/hr Percolation Rate for Reading	Soil Description / Notes / Comments
1	11:45 AM 11:55 AM	10	6.75	40.50	Light brown, silty sand
2	11:55 AM 12:05 PM	10	4.25	25.50	Hydrologic Soil Group A
3	12:05 PM 12:15 PM	10	4.75	28.50	
4	12:15 PM 12:25 PM	10	4.50	27.00	
5	12:25 PM 12:35 PM	10	4.00	24.00	
6	12:35 PM 12:45 PM	10	3.50	21.00	
7	12:45 PM 12:55 PM	10	3.55	21.30	
8	12:55 PM 1:05 PM	10	3.25	19.50	Stabilized Rate Archieved

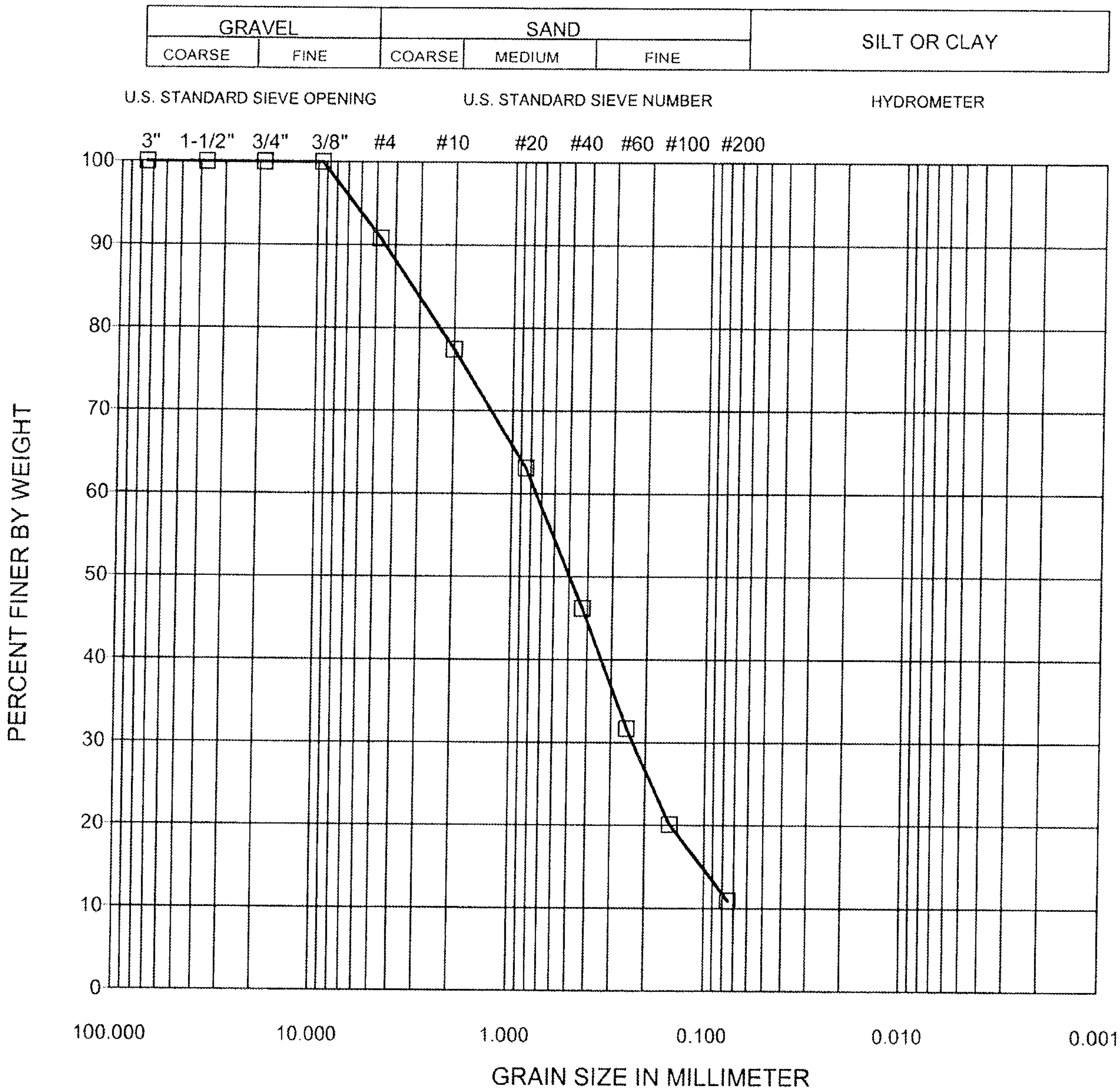
Boring/ Excavation Percolation Test Field Log

Project Location:	235 S. Arroyo Drive San Gabriel, CA	Boring/ Test Number	P-3
Earth Description	Alluvium	Diameter of Boring	8"
		Diameter of Casing	3"
Test By	D.T.	Depth of Boring	5'
Liquid Description	Tap Water	Depth of Invert of BMP	5-12'
Measurement Method	Sounder	Depth of Water Table	N/A
		Depth of Initial Water Depth (d1)	12"
Time Interval Standard			
Start Time for Pre-Soak	12:10 PM	Water Remaining In Boring (Y/N)	No
Start Time for Standard	1:40 PM	Standard Time Interval Between Readings	10 Mins

Reading Number	Time Start/ End (hh:mm)	Elapsed Time Δtime (mins)	Water Drop During Standard Time Interval Δtime (inches)	in/hr Percolation Rate for Reading	Soil Description / Notes / Comments
1	1:40 PM 1:50 PM	10	11.04	66.24	Light brown, silty sand
2	1:50 PM 2:00 PM	10	8.16	48.96	Hydrologic Soil Group A
3	2:00 PM 2:10 PM	10	6.96	41.76	
4	2:10 PM 2:20 PM	10	6.36	38.16	
5	2:20 PM 2:30 PM	10	6.72	40.32	
6	2:30 PM 2:40 PM	10	5.85	35.10	
7	2:40 PM 2:50 PM	10	5.63	33.78	
8	2:50 PM 3:00 PM	10	5.28	31.68	Stabilized Rate Archieved

Appendix C

Sieve Analysis



SYMBOL	SAMPLE ID	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	P-1	10.0	BULK	SP-SM	N/A	N/A

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Project Address:

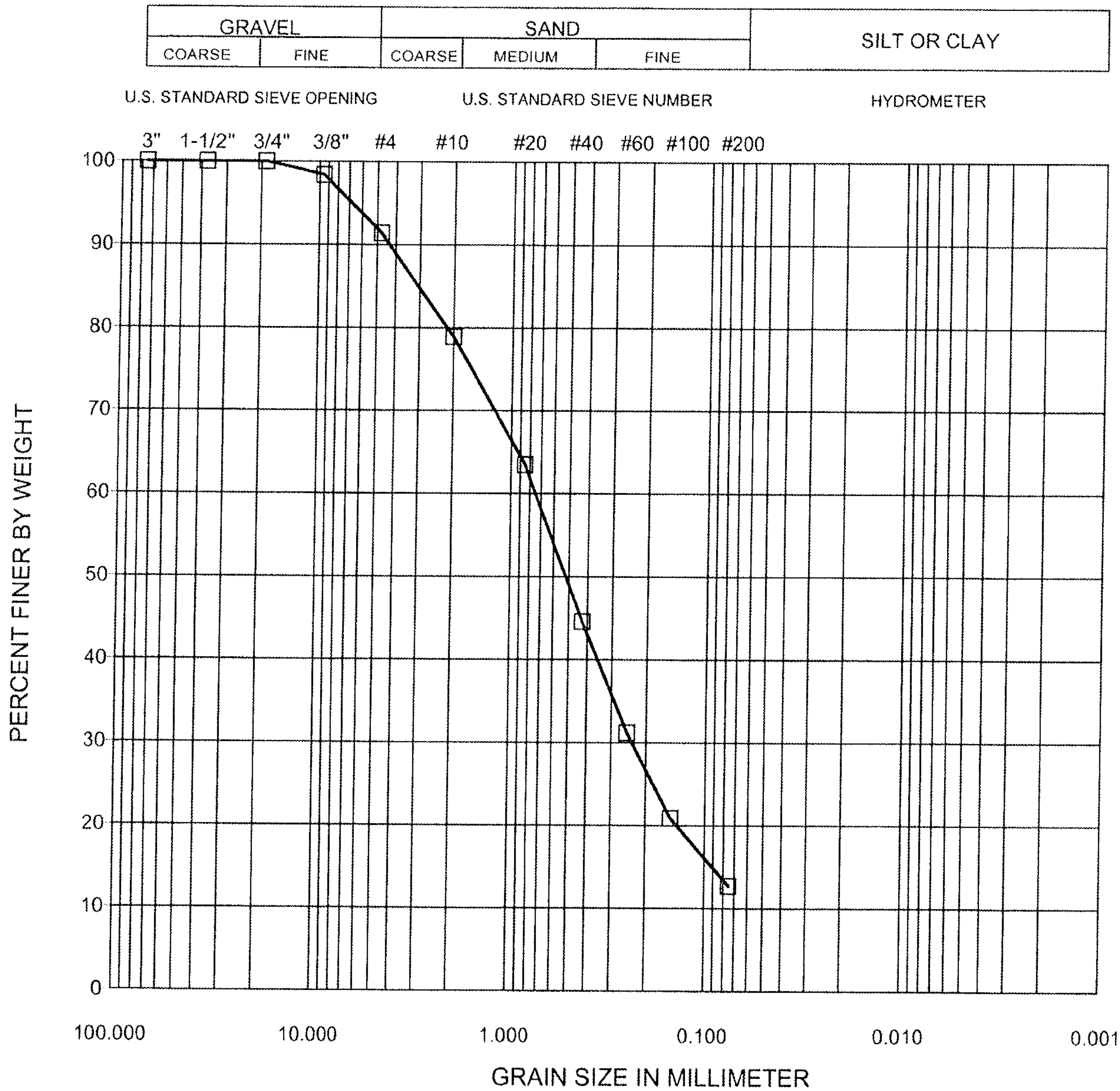
APN: 5346-011-001
235 S. Arroyo Drive
San Gabriel, California

GRAIN SIZE DISTRIBUTION CURVE

(ASTM D422)

6/16

FIGURE



SYMBOL	SAMPLE ID	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	P-2	12.0	BULK	SM	N/A	N/A

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Geotechnical, Environmental & Civil Engineering Services

Project Address:

APN: 5346-011-001
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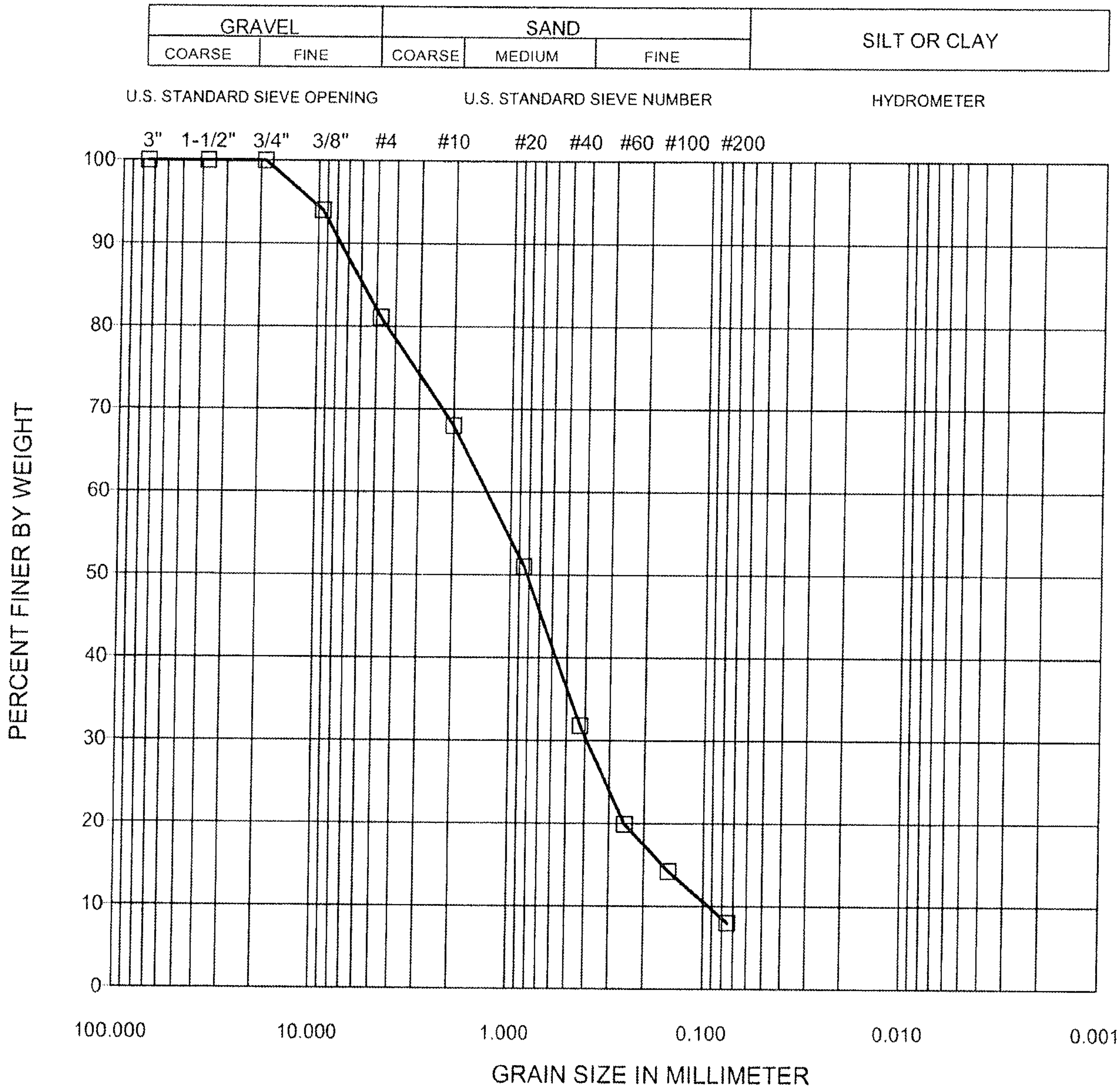
San Gabriel, California

GRAIN SIZE DISTRIBUTION CURVE
(ASTM D422)

6/16

FIGURE



SYMBOL	SAMPLE ID	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	P-3	5.0	BULK	SP-SM	N/A	N/A

Cal Land Engineering, Inc. **dba Quartech Consultants** Geotechnical, Environmental & Civil Engineering Services	Project Address: APN: 5346-011-001 235 S. Arroyo Drive San Gabriel, California

GRAIN SIZE DISTRIBUTION CURVE

(ASTM D422)

6/16

FIGURE

APPENDIX H
Acoustical Assessment

Acoustical Assessment
Arroyo Village Residential Condominium Project

CONSULTANT:

Michael Baker International
5 Hutton Centre, Suite 500
Santa Ana, CA 92707

Michael Baker INTERNATIONAL

Michael Baker
INTERNATIONAL

ACOUSTICAL ASSESSMENT
for the
Arroyo Village Residential Condominium Project
San Gabriel, California

Consultant:

Michael Baker International
5 Hutton Centre, Suite 500
Santa Ana, CA 92707
Contact: Mr. Ryan Chiene
Manager of Air and Noise Studies
949.855.7033

July 2, 2019

JN 172409

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DEFINITIONS OF COMMONLY USED TERMS IN NOISE CONTROL

The definitions that follow are in general agreement with those contained in publications of various professional organizations, including the American National Standards Institute (ANSI); the American Society for Testing and Materials (ASTM); the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); the International Organization for Standardization (ISO); and the International Electrotechnical Commission (IEC).

TERMINOLOGY

acoustic; acoustical: *Acoustic* is usually used when the term being qualified designates something that has the properties, dimensions, or physical characteristics associated with sound waves (e.g., acoustic power); *acoustical* is usually used when the term which it modifies does not explicitly designate something that has the properties, dimensions, or physical characteristics of sound (e.g., acoustical material).

ambient noise: The all-encompassing noise associated with a given environment at a specified time, usually being a composite of sound from many sources arriving from many directions, near and far; no particular sound is dominant.

attenuation: The decrease in level of sound, usually from absorption, divergence, scattering, or the cancellation of the sound waves.

average sound level (L_{eq}): The level of a steady sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Unit: decibel.

A-weighted sound level (L_A): The sound level measured with a sound-level meter using A-weighting. *Unit*: decibel (dBA).

background noise: The total noise from all sources other than a particular sound that is of interest (e.g., other than the noise being measured or other than the speech or music being listened to).

decibel (dB): A unit of level which denotes the ratio between two quantities that are proportional to power; the number of decibels correspond to the logarithm (to the base 10) of this ratio. [In many sound fields, the sound pressure ratios are not proportional to the corresponding power ratios, but it is common practice to extend the use of the decibel to such cases. One decibel equals one-tenth of a *bel*.]

equivalent continuous sound level (average sound level) (L_{eq}): The level of a steady sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound. *Unit*: decibel (dBA).

frequency (f): Of a periodic function, the number of times that a quantity repeats itself in one second, i.e., the number of cycles per second. *Unit*: hertz (Hz).

noise: Any disagreeable or undesired sound, i.e., unwanted sound.

noise level: Same as sound level. Usually used to describe the sound level of an unwanted sound.

noise reduction (NR): The difference in sound pressure level between any two points along a path of sound propagation.

sound: (1) A change in air pressure that is capable of being detected by the human ear.
(2) The hearing sensation excited by a change in air pressure.

sound level: Ten times the logarithm to the base 10 of the square of the ratio of the frequency-weighted (and time-averaged) sound pressure to the reference sound pressure of 20 micropascals. The frequency-weightings and time-weighting employed should be specified; if they are not specified, it is understood that A-frequency-weighting is used and that an averaging time of 0.125 is used. *Unit*: decibel (dBA).

SYMBOLS, ABBREVIATIONS, AND ACRONYMS

ADT	Average Daily Traffic
ANSI	American National Standards Institute
AM	Ante Meridiem
APN	Assessor's Parcel Number
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
Ldn	average day/night sound level
Leq	equivalent sound level
Lmax	maximum noise level
Lmin	minimum noise level
Ln	exceedance level
MPH	miles per hour
PM	Post Meridiem
PPV	peak particle velocity
STC	sound transmission class
VdB	velocity decibels

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EXECUTIVE SUMMARY

The purpose of this Acoustical Assessment is to evaluate potential short- and long-term noise impacts resulting from implementation of the proposed Arroyo Village Residential Condominium project ("project" or "proposed project"). The proposed project is located at 235 South Arroyo Drive in the City of San Gabriel. Overall, the project site is located within residential area of the City of San Gabriel and is within the City's Mission District Specific Plan area.

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. The underground parking garage would provide 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide seven surface-level parking spaces.

The site's existing driveway along Hampton Court would be abandoned, except for emergency access, and a new vehicular bridge with a pedestrian walkway would be installed over the Alhambra Wash at the southern portion of the project site. The vehicular bridge would provide site access at South Arroyo Drive.

<u>Temporary Impacts</u>. Based upon the results of the analysis, noise from construction activities would not exceed the noise standards of the City of San Gabriel's *Municipal Code* at nearby residential uses with compliance with recommended Mitigation Measure NOI-1. Additionally, short-term vibration impacts from construction would be less than significant.

<u>Long-Term Impacts</u>. The analysis has concluded that implementation of the proposed project would result in less than significant impacts with regard to mobile noise sources from project operations. Additionally, potentially significant impacts from mechanical equipment would be mitigated to a less than significant level with implementation of recommended Mitigation Measure NOI-2.

1.0 INTRODUCTION

The purpose of this Acoustical Assessment is to evaluate potential short- and long-term noise impacts resulting from implementation of the proposed Arroyo Village Residential Condominium project ("project" or "proposed project") in the City of San Gabriel (City).

1.1 PROJECT LOCATION

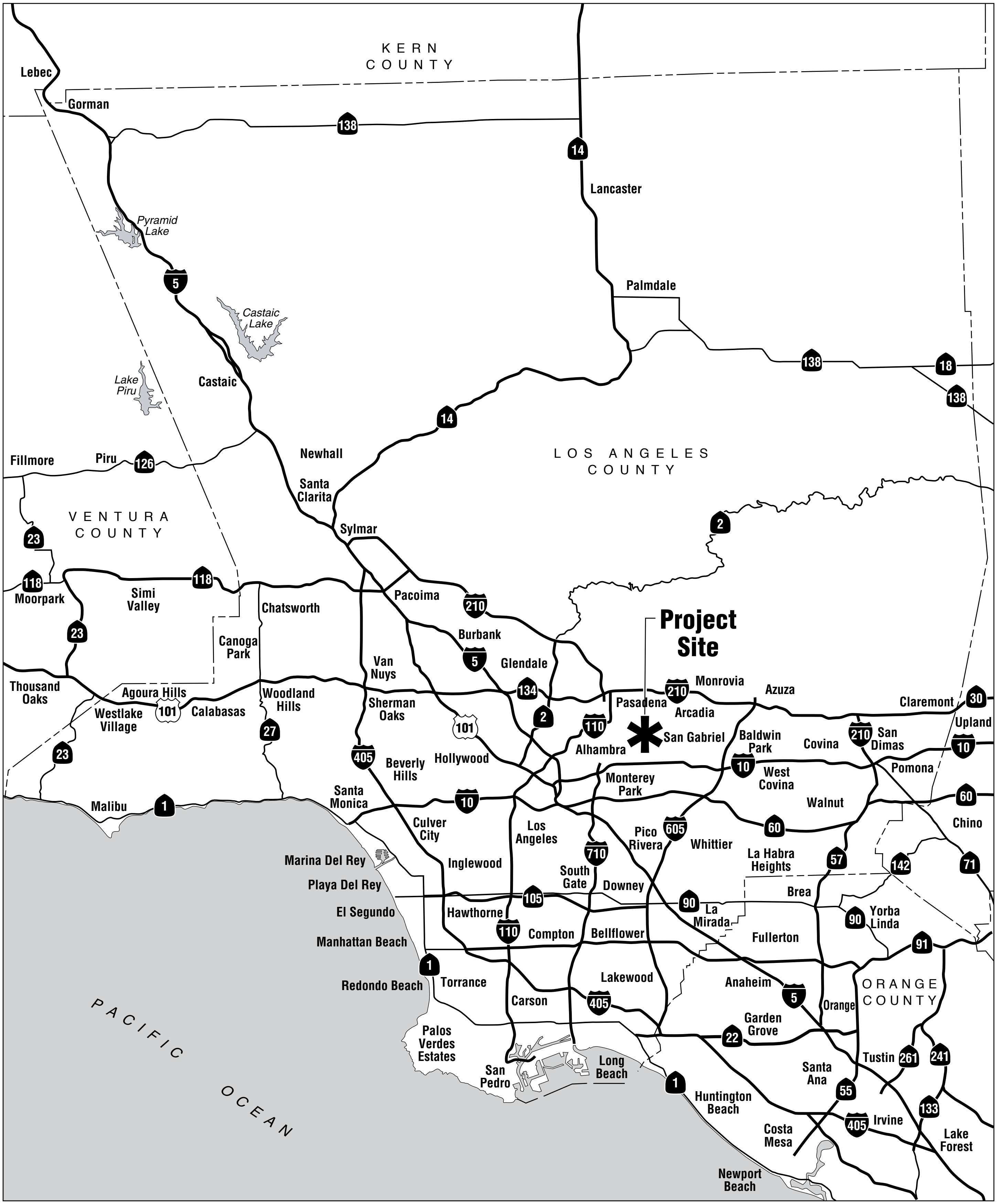
The City is located in the San Gabriel Valley of Los Angeles County, approximately 11 miles east of the Los Angeles Civic Center; refer to Exhibit 1, *Regional Vicinity*. The City consists of 4.09 square miles. Surrounding jurisdictions include the cities of San Marino and Temple City to the north, Temple City, unincorporated County of Los Angeles, and Rosemead to the east, Rosemead to the south, and Alhambra to the west.

The proposed project is approximately 1.12 acres and is located at 235 South Arroyo Drive in the City of San Gabriel (Assessor's Parcel Numbers [APN] 5346-011-001, 5346-011-004, and 5346-011-006); refer to Exhibit 2, *Site Vicinity*. A limited portion of the project site is located in the City of Alhambra at APN 5346-008-031, 5346-009-008, and 5346-009-010. Regional access to the project site is provided via the San Bernardino Freeway (Interstate 10 or I-10) or the Foothill Freeway (Interstate 210 or I-210). Local access to the project site is provided by Arroyo Drive.

1.2 PROJECT DESCRIPTION

The project proposes to demolish the existing on-site single-family residential building to construct a new four-story residential building encompassing 41 condominium units totaling approximately 55,000 square feet with a 36,000 square foot underground parking garage; refer to Exhibit 3, *Conceptual Site Plan*. Each condominium unit would range between two to four bedrooms and would range in size between 1,230 to 2,489 square feet. The project would incorporate approximately 30,654 square feet of private and common residential open space, including covered and uncovered courtyards, balconies, terraces, and decks. The underground parking garage would provide 97 parking spaces, including 83 residential parking spaces and 14 guest parking spaces. In addition, the project would provide seven surface-level parking spaces.

The site's existing driveway along Hampton Court would be abandoned, except for emergency access, and a new vehicular bridge with a pedestrian walkway would be installed over the Alhambra Wash at the southern portion of the project site; refer to Exhibit 4, *Conceptual Bridge Plan*. The vehicular bridge would provide site access at South Arroyo Drive.



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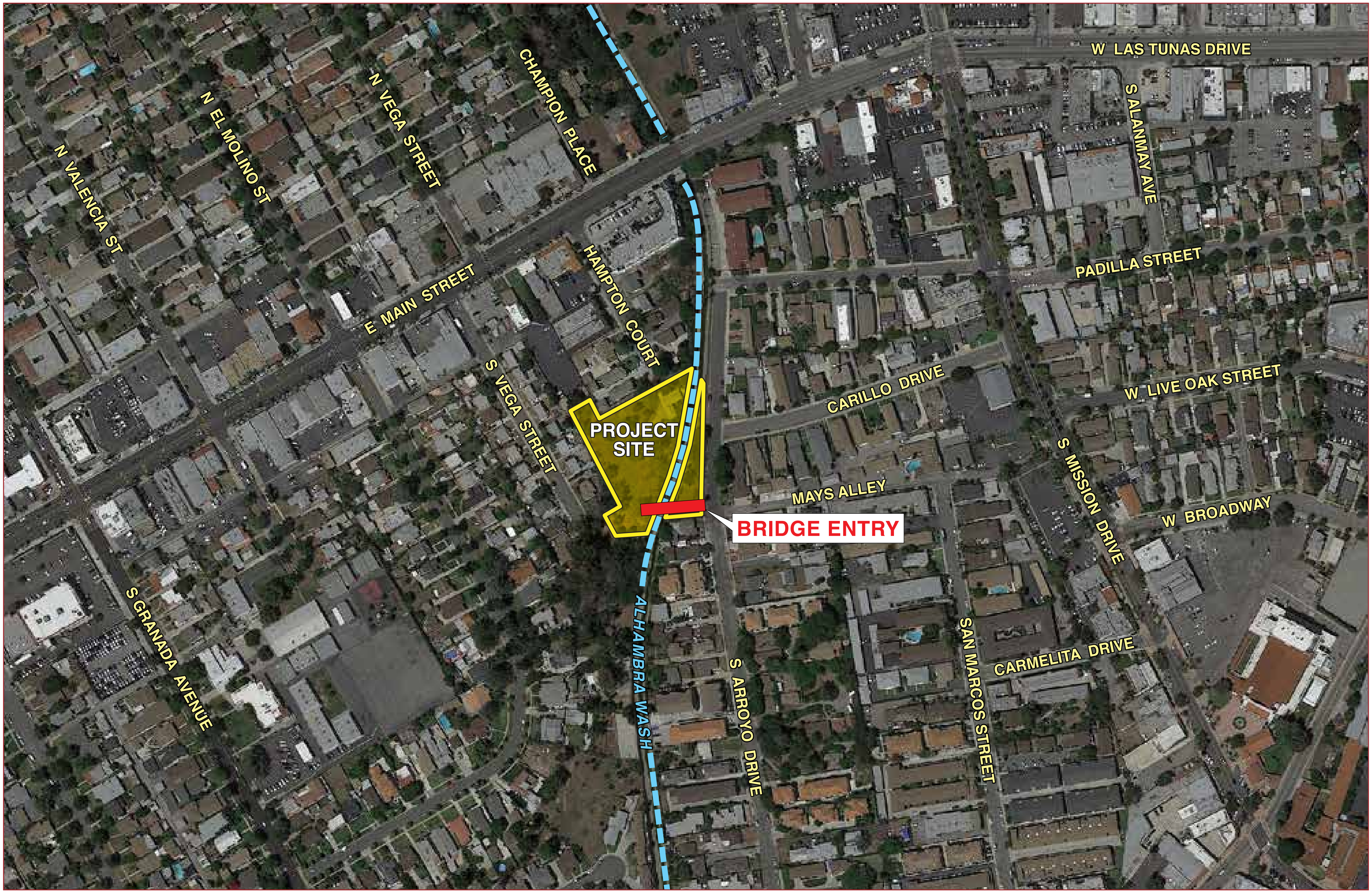
ACOUSTICAL ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Regional Vicinity

Exhibit 1



Source: Google Earth, April 2019.

ACOUSTICAL ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Site Vicinity

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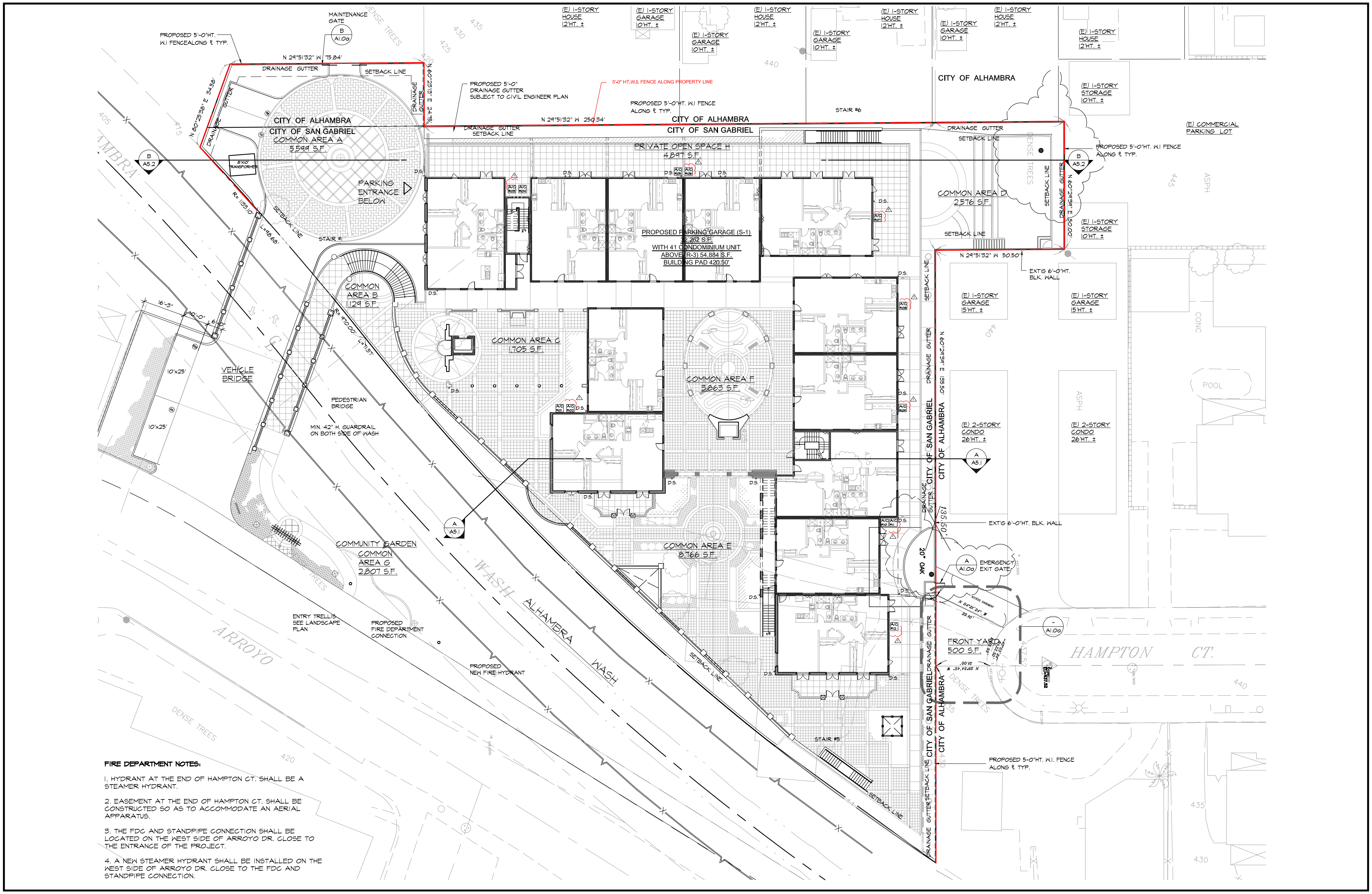
NOT TO SCALE

06/19 I JN 172409

Exhibit 2



Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0, *Site Plan*, May 20, 2019.

ACOUSTICAL ASSESSMENT
ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Site Plan

NOT TO SCALE

06/19 | JN 172409

Exhibit 3

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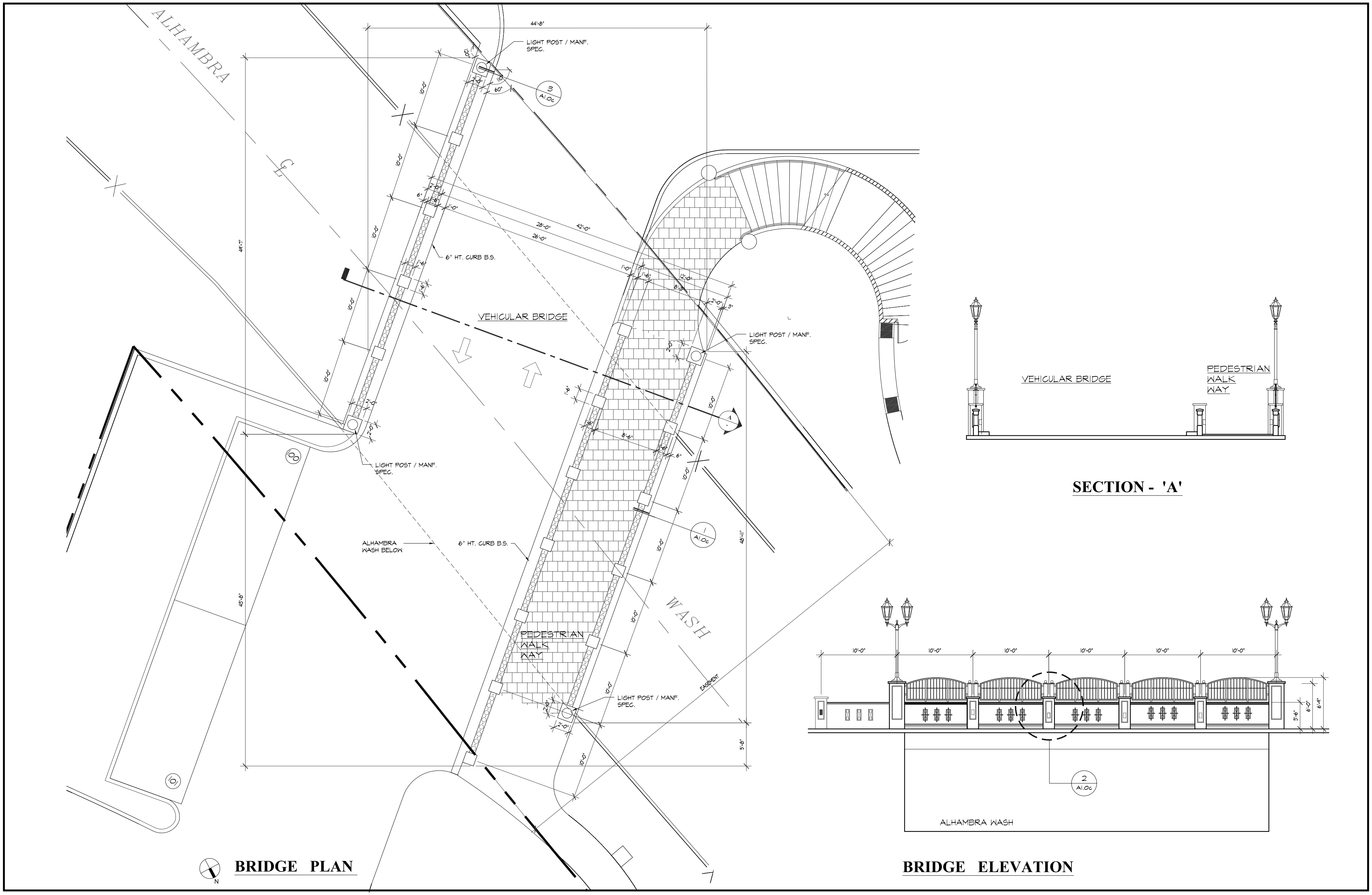


Source: Design Inspiration Group, Inc., Arroyo Village Sheet A1.0b, Bridge Plan, August 13, 2013.

NOT TO SCALE

Michael Baker INTERNATIONAL

ACOUSTICAL ASSESSMENT

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Conceptual Bridge Plan

06/19 | JN 172409

Exhibit 4

MISSION DISTRICT SPECIFIC PLAN

The proposed project is within the *Mission District Specific Plan* (Specific Plan) (August 2004) area. The Environmental Impact Report (EIR), dated July 2004, for the Specific Plan determined that impacts related to long-term vehicular traffic noise would be significant and unavoidable. The following three roadway segments would have exterior noise levels that would exceed adopted noise standards:

- Santa Anita Street: north of Las Tunas Drive;
- Broadway: east of Junipero Serra Drive; and
- Junipero Serra Drive: San Marino Avenue to Broadway.

All other noise impacts were less than significant with the implementation of mitigation measures.

2.0 DESCRIPTION OF NOISE METRICS

2.1 STANDARD UNIT OF MEASUREMENT

Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by differentiating among frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is perceived to be twice as loud and 20 dBA higher is perceived to be four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are illustrated on Exhibit 5, *Common Environmental Noise Levels*.

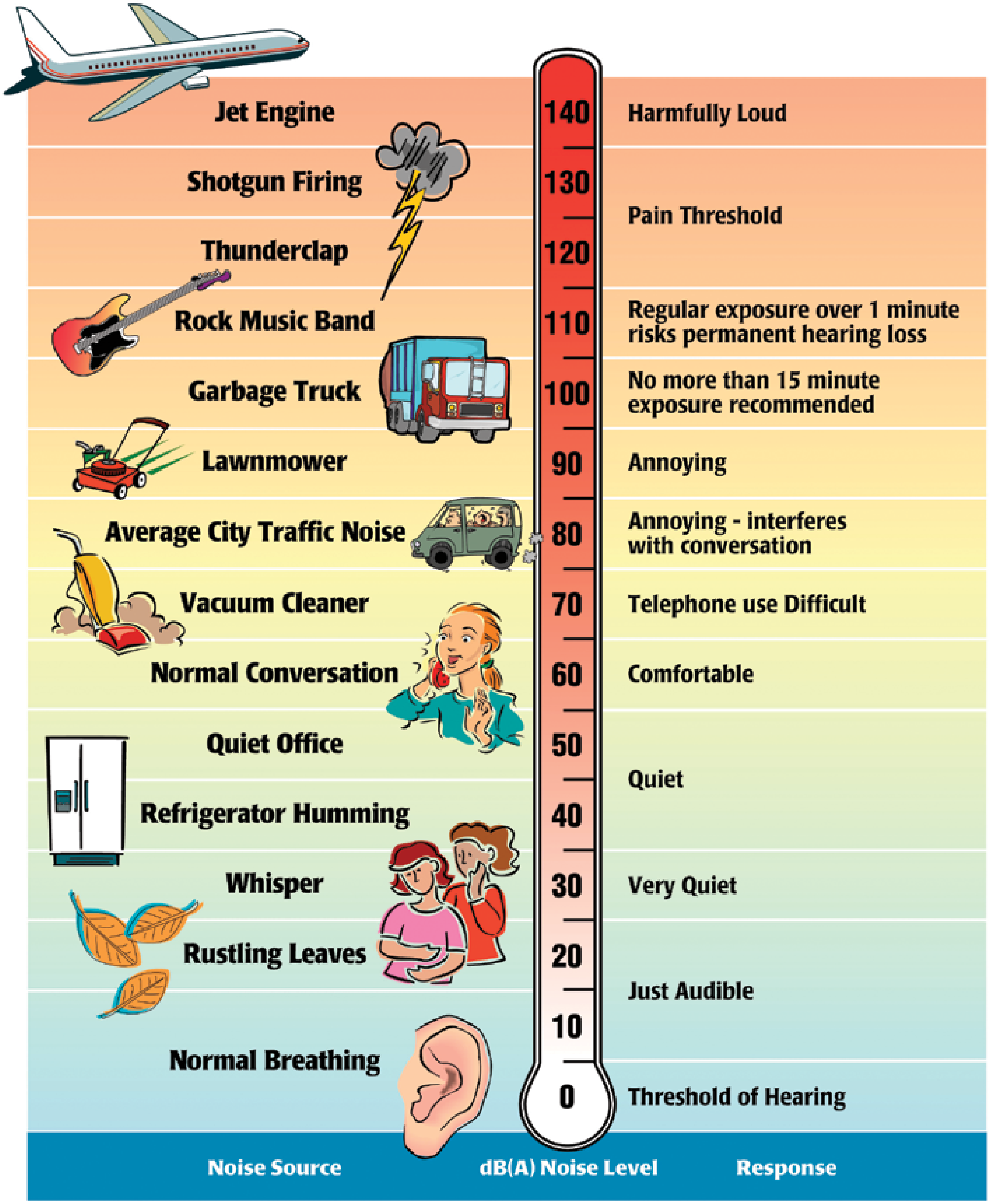
Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Table 1, *Noise Descriptors*, provides a listing of methods to measure sound over a period of time.

2.2 HEALTH EFFECTS OF NOISE

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise generally increases with the environmental sound level. However, many factors also influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses would range from "not annoyed" to "highly annoyed."



Source:

Melville C. Branch and R. Dale Beland, *Outdoor Noise in the Metropolitan Environment*, 1970.

Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004)*, March 1974.

Common Environmental Noise Levels

Table 1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 p.m. to 10:00 p.m., and +10 dBA for the night, 10:00 p.m. to 7:00 a.m.
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the L_{eq}'s for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 p.m. to 7:00 a.m.) by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.

Source: Cyril M. Harris, *Handbook of Noise Control*, 1979.

When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible, and as the noise level rises, dissatisfaction among the public steadily increases. However, an individual's reaction to a particular noise depends on many factors, such as the source of the sound, its loudness relative to the background noise, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

- Noise-Induced Hearing Loss;
- Interference with Communication;
- Effects of Noise on Sleep;
- Effects on Performance and Behavior;

- Extra-Auditory Health Effects; and
- Annoyance.

Although it often causes discomfort and sometimes pain, noise-induced hearing loss usually takes years to develop. Noise-induced hearing loss can impair the quality of life through a reduction in the ability to hear important sounds and to communicate with family and friends. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. While the loss may be temporary at first, it could become permanent after continued exposure. When combined with hearing loss associated with aging, the amount of hearing loss directly caused by the environment is difficult to quantify. Although the major cause of noise-induced hearing loss is occupational, substantial damage can be caused by non-occupational sources.

According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise.

Interference with communication has proven to be one of the most important components of noise-related annoyance. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Recent research indicates that more moderate noise levels can produce disruptive after-effects, commonly manifested as a reduced tolerance for frustration, increased anxiety, decreased incidence of "helping" behavior, and increased incidence of "hostile" behavior. Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. Most effects seem to be transitory, but with continued exposure some effects have been shown to be chronic in laboratory animals.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one's peace of mind and the enjoyment of one's environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the relationship between the effects of annoyance and the community were quantified. In areas where exterior noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA Community Noise Equivalent Level (CNEL), that percentage rises to 15 percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.

3.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Land uses deemed sensitive by the State of California (State) within the vicinity of the project site include schools. Many jurisdictions also consider single- and multi-family residential uses particularly noise-sensitive because families and individuals expect to use time in the home for rest and relaxation, and noise can interfere with those activities. Some jurisdictions may also identify other noise-sensitive uses such as churches. Land uses that are relatively insensitive to noise include office, commercial, and retail developments. There is a range of insensitive noise receptors that include uses that generate significant noise levels and that typically have a low level of human occupancy.

This noise analysis was conducted in accordance with Federal, State, and local criteria described in the following sections.

3.1 U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) offers guidelines for community noise exposure in the publication *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*. These guidelines consider occupational noise exposure as well as noise exposure in homes. The EPA recognizes an exterior noise level of 55 decibels day-night level (dB L_{dn}) as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The EPA and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 to 65 dB L_{dn} are acceptable. However, the EPA notes that these levels are not regulatory goals, but are levels defined by a negotiated scientific consensus, without concern for economic and technological feasibility or the needs and desires of any particular community.

3.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The State Office of Planning and Research Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL. Table 2, *Land Use Compatibility for Community Noise Environments*, presents guidelines for determining acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 2
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure (Ldn or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 - 70	70-75	75-85
Residential - Multiple Family	50 – 65	60 - 70	70 – 75	70 - 85
Transient Lodging - Motel, Hotels	50 – 65	60 - 70	70 – 80	80 - 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 - 70	70 – 80	80 - 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 - 70	NA	65 - 85
Sports Arenas, Outdoor Spectator Sports	NA	50 - 75	NA	70 - 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 75	72.5 - 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 – 80	80 - 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 - 77.5	75 – 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 - 80	75 – 85	NA

NA: Not Applicable; Ldn: average day/night sound level; CNEL: Community Noise Equivalent Level

Notes:
Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable - New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable – New construction or development should generally not be undertaken.

Source: Office of Planning and Research, California, *General Plan Guidelines*, October 2003.

3.3 LOCAL JURISDICTION

CITY OF SAN GABRIEL GENERAL PLAN

The *Comprehensive General Plan of the City of San Gabriel, California* (General Plan) Noise Element identifies noise-sensitive land uses and noise sources, defines areas of noise impact, and establishes goals, policies, and programs to ensure that City residents are protected from excessive noise. The following lists applicable noise goals and targets obtained from the General Plan*:*

Goal 9.2: *Minimize the impact of traffic noise for those who live and work on our major roadways.*

Target 9.2.1: *Commit to using innovative noise reducing asphalt products when resurfacing or repaving major arterial streets.*

Goal 9.4: *Protect residents from the harmful effects of noise from mechanical equipment and trucks.*

Target 9.4.1: Adopt a comprehensive noise ordinance by 2006, including allowable decibel levels in commercial/industrial areas and residential areas adjacent to them.

Goal 9.6: Promote the health of our community by protecting it from the harmful effects of noise.

Table 3, *Exterior Noise Standards*, provides noise standards for designated land uses within the City and Table 4, *Interior Noise Standards*, provides the City's interior noise standards.

Table 3
Exterior Noise Standards

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dB)	Standard 1 (dB) [1]	Standard 2 (dB) [2]	Standard 3 (dB) [3]	Standard 4 (dB)[4]	Standard 5 (dB)[5]
I	Noise-sensitive area	Anytime	45	45	50	55	60	65
II	Residential properties	10:00 p.m. – 7:00 a.m. (Nighttime)	45	45	50	55	60	65
		7:00 a.m. – 10:00 p.m. (Daytime)	50	50	55	60	65	70
III	Commercial properties	10:00 p.m. – 7:00 a.m. (Nighttime)	55	55	60	65	70	75
		7:00 a.m. – 10:00 p.m. (Daytime)	60	60	65	70	75	80
IV	Industrial properties	Anytime	70	70	75	80	85	90

Notes:
1. Standard No. 1 is the exterior noise level that may not be exceeded for more than a total of 30 minutes in any hour.
2. Standard No. 2 is the exterior noise level that may not be exceeded for more than a total of 15 minutes in any hour.
3. Standard No. 3 is the exterior noise level that may not be exceeded for more than a total of 5 minutes in any hour.
4. Standard No. 4 is the exterior noise level that may not be exceeded for more than a total of 1 minute in any hour.
5. Standard No. 5 is the exterior noise level that may not be exceeded for any period of time.

Source: City of San Gabriel, *Comprehensive General Plan of the City of San Gabriel*, May 18, 2004.

Table 4
Interior Noise Standards

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Allowable Interior Noise level (dB)	Standard 1 (dB) [1]	Standard 2 (dB) [2]	Standard 3 (dB) [3]
All	Residential	10:00 p.m. – 7:00 a.m.	40	45	50	55
		7:00 a.m. – 10:00 p.m.	45	45	50	55

Notes:
1. Standard No. 1 is the interior noise level that may not be exceeded for more than a total of 5 minutes in any hour.
2. Standard No. 2 is the interior noise level that may not be exceeded for more than a total of 1 minute in any hour.
3. Standard No. 3 is the interior noise level that may not be exceeded for any period of time.

Source: City of San Gabriel, *Comprehensive General Plan of the City of San Gabriel*, May 18, 2004.

CITY OF SAN GABRIEL MUNICIPAL CODE

Although the City's noise standards are contained within the General Plan, the *San Gabriel Municipal Code* (SGMC) includes several references to noise control. The following sections of the SGMC are applicable to the proposed project.

> *§ 98.02 MAINTENANCE OF PREMISES; NUISANCES.*
>
> *It shall be unlawful and hereby declared a public nuisance for any person or persons either owning, leasing, occupying or having charge or possession of any real property within the city to cause, permit or allow any of the following conditions to exist thereon:*
>
> *(T) To maintain or operate, between the hours of 10:00 PM and 7:00 AM, any device, instrument, vehicle or machinery in such a manner as to create noise or cause vibrations which cause discomfort or annoyance to reasonable persons of normal sensitivity, or which endangers the comfort, repose, health or peace of the public or of any person using or occupying other property in the vicinity;*
>
> *Title XIII: General Offenses*
>
> *§ 130.09 NOISE CAUSED BY MACHINERY.*
>
> *It shall be unlawful for any person to run or operate, or permit to be run or operated, any mechanical, electrical, electronic, hydraulic, or wind-driven equipment, fan, pump, compressor, blower, motor, engine, machine, or other similar apparatus, whether as owner, agent, employee, lessee, or other person having the charge thereof, which causes, or is likely to cause, any loud, excessive, unnecessary, or unusual continued or intermittent noise, or any noise which annoys, disturbs, injures, or endangers the comfort, repose, health, peace, or safety of others within the city unless such noise is muffled effectually and the apparatus is either equipped with a muffler device in constant operation and properly maintained to deaden such noise, or the apparatus is enclosed in a room, building, or other enclosure sufficiently insulated to deaden such noise.*
>
> *Title XV: Land Usage*
>
> *§ 150.003 Construction; Hours of Construction*
>
> *No construction shall take place within the city except between the hours of 7:00 AM and 7:00 PM, Monday through Friday and between the hours of 8:00 AM and 4:00 PM on Saturday. Construction shall be prohibited on Sundays and such holidays as may be designated by Council resolution. The Community Development Director may extend the hours of operation for special circumstances by providing written notice to surrounding residents in advance. The restriction on construction hours shall not apply*

to emergency repairs required to protect the public health, safety, ad welfare, whether performed by a public agency, utility, company, or private owner. Said restrictions also shall not apply to a residential property owner and or members of his immediate family, performing work on his personal property.

4.0 EXISTING CONDITIONS

4.1 NOISE MEASUREMENTS

In order to quantify existing ambient noise levels in the project area Michael Baker International (Michael Baker) conducted two noise measurements on May 1, 2019; refer to Table 5, *Noise Measurements*. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site. Ten-minute measurements were taken, between 10:30 a.m. and 12:00 p.m., at each site during the day. Short-term (L_{eq}) measurements are considered representative of the noise levels in the project vicinity.

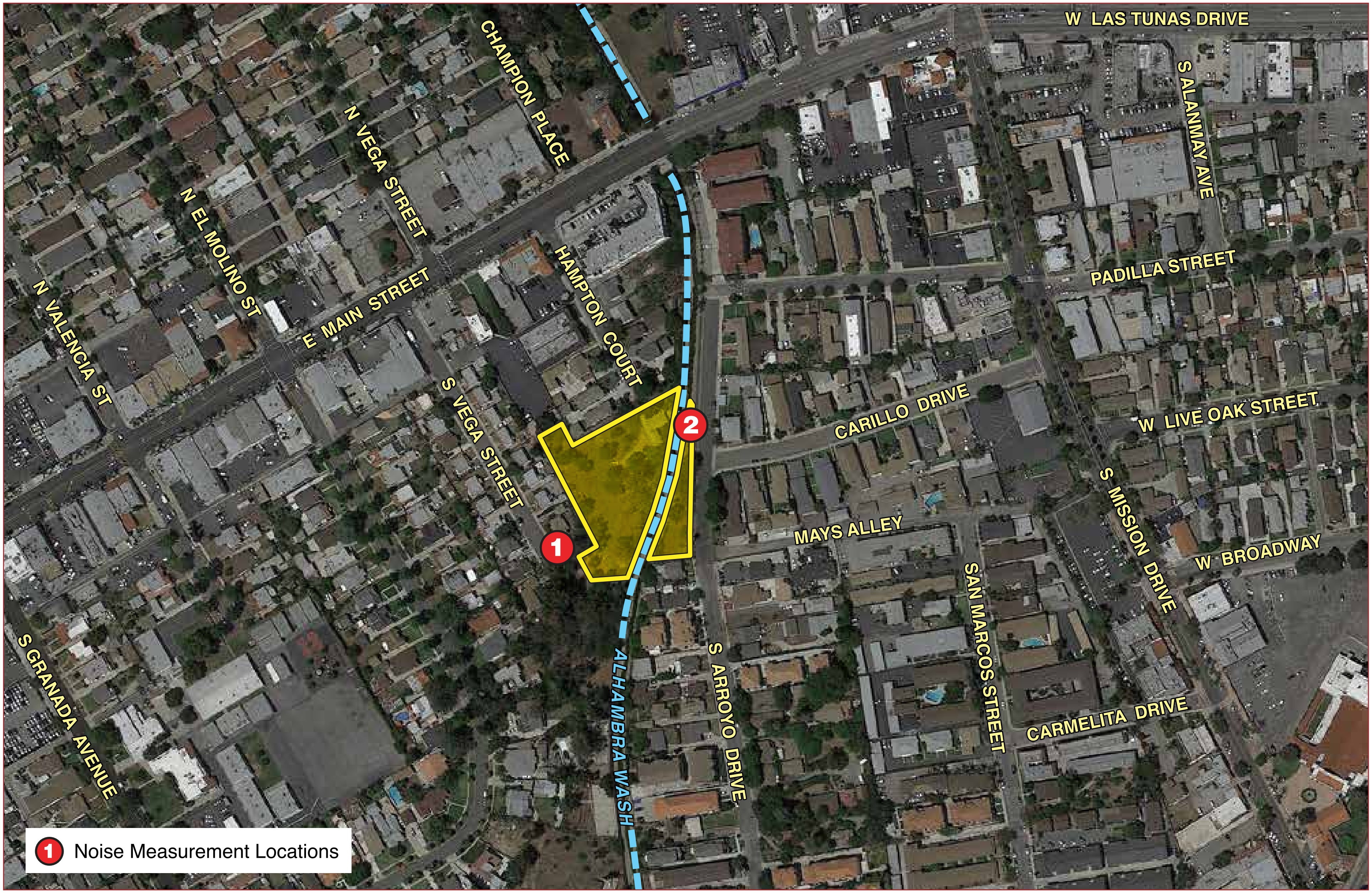
Table 5
Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time
1	Cul-de-sac of Vega Street.	48.3	36.2	66.6	80.8	11:22 a.m.
2	Corner of Carillo Drive and South Arroyo Drive.	54.3	34.5	76.4	75.1	10:59 a.m.
Source: Michael Baker International, May 1, 2019.						

Meteorological conditions were clear skies, warm temperatures, with light wind speeds (0 to 5 miles per hour), and low humidity. Measured noise levels during the daytime measurements ranged from 48.3 to 54.3 dBA L_{eq}. Noise monitoring equipment used for the ambient noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a Type 4189 pre-polarized microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. The results of the field measurements are included in Appendix A, *Noise Measurement Data*. Refer to Exhibit 6, *Noise Measurement Locations*, for the noise measurement sites.

4.2 SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. Existing sensitive receptors located in the project vicinity include residential uses, recreational uses, schools, places of worship, and libraries. Sensitive receptors are listed in Table 6, *Sensitive Receptors*.



Source: Google Earth, April 2019.

Michael Baker INTERNATIONAL

NOT TO SCALE

06/19 I JN 172409

ACOUSTICAL ASSESSMENT

ARROYO VILLAGE RESIDENTIAL CONDOMINIUM PROJECT

Noise Measurement Locations

Exhibit 6

Table 6
Sensitive Receptors

Type	Name	Distance from Project Site (feet)	Direction from Project Site	Location
Residential	Residential Uses	Adjoining	North	Along Arroyo Drive and Hampton Court
		Adjoining	East	Along Arroyo Drive and Carillo Drive
		Adjoining	South	Along Arroyo Drive
		Adjoining	West	Along Vega Street
Schools	Paramount Academy	680	Northwest	1027 East Main Street, Alhambra, CA 91801
	Growing Time Montessori School	934	East	248 South Mission Drive, San Gabriel, CA 91776
	Granada Elementary School	770	Southwest	100 South Granada Avenue, Alhambra, CA 91801
	San Gabriel Mission High School	1,664	East	254 South Santa Anita Street, San Gabriel, CA 91776
	San Gabriel High School	1,945	South	801 South Ramona Street, San Gabriel, CA 91776
	Children's Montessori Center	1,985	Southwest	19 North Hidalgo Avenue, Alhambra, CA 91801
	St. Therese School Alhambra	2,417	Northwest	1106 East Alhambra Road, Alhambra, CA 91801
	Washington Elementary School	3,490	Northeast	300 North San Marino Avenue, San Gabriel, CA 91775
	Emmaus Lutheran School	4,506	South	840 South Almansor Street, Alhambra, CA 91801
	Martha Baldwin Elementary School	4,905	South	900 South Almansor Street, Alhambra, CA 91801
	Alhambra High School	5,033	Southwest	101 South 2nd Street, Alhambra, CA 91801
Library	Jack Miller Memorial Library	4,313	Southwest	20 West Commonwealth Avenue, Alhambra, CA 91801
	Alhambra Civic Center Library	4,641	Southwest	101 South 1st Street, Alhambra, CA 91801
Places of Worship	Church in San Gabriel	1,318	Southeast	615 West Santa Anita Street, San Gabriel, CA 91776
	San Gabriel Mission	1,579	Southeast	428 South Mission Drive, San Gabriel, CA 91776
	Alhambra First United Methodist	2,306	West	9 North Almansor Street, Alhambra, CA 91801
	Sacred Heart Retreat	2,400	Northwest	507 North Granada Avenue, Alhambra, CA 91801
	St. Therese Church	2,533	Northwest	1100 East Alhambra Road, Alhambra, CA 91801
	Alhambra Seventh Day Adventist	2,771	Southwest	220 South Chapel Avenue, Alhambra, CA 91801
	San Gabriel Presbyterian Church	3,308	East	200 West Las Tunas Drive, San Gabriel, CA 91776
	Church of Our Saviour	3,721	Northeast	535 West Roses Road, San Gabriel, Ca 91775
	Carmel of St Teresa	4,100	Northwest	215 East Alhambra Road, Alhambra, CA 91801
Parks	Plaza Park	1,802	Southeast	Along Mission Road
	Lindaraka Park	1,953	Northwest	North Cordova Street, Alhambra, CA
	Alhambra Golf Course	2,113	South	630 South Almansor Street, Alhambra, CA 91801
	Smith Park	2,635	East	232 West Broadway, San Gabriel, CA 91776
	Story Park	3,058	West	210 North Chapel Avenue, Alhambra, CA 91801
	Almansor Park	3,687	Southwest	800 South Almansor Street, Alhambra, CA 91801
	San Gabriel Country Club	5,100	Northeast	350 East Hermosa Drive, San Gabriel, CA 91775

Note:
1 – Distances are measured from the exterior project boundary only and not from individual construction areas within the interior of the project site.
Source: Google Earth, 2019.

4.3 EXISTING NOISE LEVELS

MOBILE SOURCES

Vehicle-related mobile noise is the most common source of noise in the site vicinity. In addition, commercial uses to the north contribute to infrequent mobile noise sources in the site vicinity.

STATIONARY SOURCES

The project area is located in an urbanized area. The primary sources of stationary noise in the project vicinity are urban-related activities, including parking areas, people talking, truck deliveries, dogs barking, etc. The noise associated with these sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

5.0 POTENTIAL ACOUSTICAL IMPACTS

CEQA THRESHOLDS

Appendix G of the *CEQA Guidelines* contains analysis guidelines related to the assessment of noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. As stated in Appendix G, a project would create a significant environmental impact if it would result in:

- 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 (refer to Impact Statement NOI-1);

- Generation of excessive groundborne vibration or groundborne noise levels (refer to Impact Statement NOI-2); and

- 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, expose people residing or working in the project area to excessive noise levels (refer to Impact Statement NOI-3).

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are provided for all potentially significant impacts.

SIGNIFICANCE OF CHANGES IN TRAFFIC NOISE LEVELS

An off-site traffic noise impact typically occurs when there is a discernable increase in traffic and the resulting noise level exceeds an established noise standard. In community noise considerations, changes in noise levels greater than 3 dB are often identified as substantial, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. However, this is based on a direct, immediate comparison of two sound levels. Community noise exposures occur over a long period of time and changes in noise levels occur over years (rather than the immediate comparison made in a laboratory situation). Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB is the most commonly accepted discernable difference. A 5 dB change is generally recognized as a clearly discernable difference.

As traffic noise levels at sensitive uses likely approach or exceed the applicable land use compatibility standard (refer to Table 2), a 3 dB increase as a result of the project is used as the increase threshold for the project. Thus, a project would result in a significant noise impact when a permanent increase in ambient noise levels of 3 dB occur upon project implementation and the resulting noise level exceeds the applicable exterior standard at a noise sensitive use.

As stated above, the proposed project is within Specific Plan area. The *Mission District Specific Plan Program EIR* (Specific Plan EIR) that impacts related to long-term vehicular traffic noise would be significant and unavoidable. The following three roadway segments would have exterior noise levels that would exceed adopted noise standards:

- Santa Anita Street: north of Las Tunas Drive;
- Broadway: east of Junipero Serra Drive; and
- Junipero Serra Drive: San Marino Avenue to Broadway.

All other noise impacts were less than significant with the implementation of mitigation measures.

NOI-1 *GENERATION OF A SUBTANTIAL 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?*

Level of Significance Before Mitigation: *Potentially Significant Impact.*

SHORT-TERM CONSTRUCTION

Construction of the proposed project would occur over approximately 17 months and would include demolition, site preparation, grading, paving, building construction, and architectural coating. Groundborne noise and other types of construction-related noise impacts would typically occur during excavation activities of the grading phase. This phase of construction has the potential to create the highest levels of noise. Typical noise levels generated by construction equipment are shown in Table 7, *Maximum Noise Levels Generated by Construction Equipment*. It should be noted that the noise levels identified in Table 7 are maximum sound levels (L_{max}), which are the highest individual sound occurring at an individual time period. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

Table 7
Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Acoustical Use Factor[1]	L_{max} at 50 Feet (dBA)
Concrete Saw	20	90
Crane	16	81
Concrete Mixer Truck	40	79
Backhoe	40	78
Dozer	40	82
Excavator	40	81
Forklift	40	78
Paver	50	77
Roller	20	80
Tractor	40	84
Water Truck	40	80
Grader	40	85
General Industrial Equipment	50	85

Note:
1. Acoustical Use Factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.

The potential for construction-related noise to affect nearby residential receptors would depend on the location and proximity of construction activities to these receptors. Construction would occur throughout the project site and would not be concentrated or confined in the area directly adjacent to sensitive receptors. Therefore, construction noise would be acoustically dispersed throughout the project site and not concentrated in one area near adjacent sensitive uses. It should also be noted that the noise levels depicted in Table 7 are maximum noise levels, which would occur sporadically when construction equipment is operated in proximity to sensitive receptors.

Pursuant to SGMC Section 150.003, construction activities may occur between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, 8:00 a.m. and 4:00 p.m. Saturdays, and is prohibited on Sundays or legal holidays. These permitted hours of construction are included in the code in recognition that construction activities undertaken during daytime hours are a typical part of living in an urban environment and do not cause a significant disruption. Given the sporadic and variable nature of proposed project construction and the implementation of time limits specified in the SGMC, short-term construction noise impacts would be less than significant. Additionally, to further reduce the potential for noise impacts, Mitigation Measure NOI-1 would be implemented to incorporate best management practices during construction. Implementation of Mitigation Measure NOI-1 would further minimize impacts from construction noise as it requires construction equipment to be equipped with properly operating and maintained mufflers and other state required noise attenuation devices.

LONG-TERM OPERATIONAL IMPACTS

Mobile Noise

Future development generated by the proposed project would result in additional traffic on adjacent roadways, thereby increasing vehicular noise in the vicinity of existing and proposed land uses. According to the *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, a doubling of traffic volumes would result in a 3 dB increase in traffic noise levels, which is barely detectable by the human ear.[1] Based on the *Arroyo Village Condo Development Traffic Impact Study* (Traffic Impact Study) prepared by Traffic Design, Inc. (dated June 20, 2019), the proposed project is projected to generate a total of approximately 238 daily trips, which includes approximately 18 a.m. peak hour trips and approximately 21 p.m. peak hour trips. Table 8, *Existing and Project Traffic Volumes* depicts existing and project generated peak hour traffic volumes in the project vicinity. As shown in Table 8, project peak hour traffic volumes would not double existing peak hour traffic volumes. Therefore, a 3 dB increase in traffic noise levels would not occur in the project vicinity as a result of the project and any increase in traffic noise along local roadways would be imperceptible. Impacts would be less than significant in this regard.

Table 8
Existing and Project Traffic Volumes

Intersection	Existing Trips[1]	Project Trips[1]	Doubling of Traffic Volumes?
Arroyo Drive/Carillo Drive	76 a.m.	5 a.m.	No
	70 p.m.	9 p.m.	No
Mission Road/Carillo Drive	673 a.m.	13 a.m.	No
	829 p.m.	12 p.m.	No
Arroyo Drive/Santa Anita Street	567 a.m.	13 a.m.	No
	623 p.m.	12 p.m.	No

Notes:
1. Represents peak hour trips.
Source: Traffic Design, Inc., *Arroyo Village Condo Development Traffic Impact Study*, June 20, 2019.

Cumulative Mobile Source Impacts

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the proposed project and other projects in the vicinity. Therefore, cumulative traffic-generated noise impacts have been assessed based on the contribution of

[1] U.S. Department of Transportation, *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, updated August 24, 2017, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed on June 26, 2019.

project area buildout to the future cumulative base traffic volumes in the project area and the vicinity.

A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. As previously stated, a doubling of traffic volumes would result in a perceptible (i.e. 3 dB) increase in traffic noise levels. Table 9, *Cumulative Traffic Volumes* compares the "Existing", "Cumulative No Project", and "Cumulative + Project" peak hour traffic volumes, as well as the associated change in peak hour traffic volumes. As shown in Table 9, the "Cumulative + Project" peak hour traffic volumes would not double the "Existing" peak hour traffic volumes or the "Cumulative No Project" peak hour traffic volumes. Therefore, the project would not result in a perceptible increase in cumulative traffic noise levels. Thus, the proposed project, in combination with cumulative traffic noise levels, would result in less than significant impacts.

Table 9
Cumulative Traffic Volumes

Intersection	Existing Trips[1]	Cumulative No Project Trips[1]	Cumulative + Project Trips[1]	Difference between Existing Trips and Cumulative + Project Trips[1]	Difference between Cumulative No Project Trips and Cumulative + Project Trips[1]	Doubling of Traffic Volumes?
Arroyo/Carillo	76 a.m.	86 a.m.	91 a.m.	15 a.m.	5 a.m.	No
	70 p.m.	85 p.m.	94 p.m.	24 p.m.	9 p.m.	No
Mission/Carillo	673 a.m.	831 a.m.	844 a.m.	171 a.m.	13 a.m.	No
	829 p.m.	1,068 p.m.	1,080 p.m.	251 p.m.	12 p.m.	No
Arroyo/Santa Anita	567 a.m.	594 a.m.	607 a.m.	40 a.m.	13 a.m.	No
	623 p.m.	660 p.m.	672 p.m.	49 p.m.	12 p.m.	No

Notes:
1. Represents peak hour trips.
Source: Traffic Design, Inc., *Arroyo Village Condo Development Traffic Impact Study*, June 20, 2019.

STATIONARY NOISE IMPACTS

Outdoor Gathering Areas

The project would incorporate approximately 30,654 square feet of private and common outdoor gathering areas (i.e. courtyards, balconies, terraces, and decks). The proposed outdoor gathering areas have the potential to be accessed by groups of people intermittently for outdoor events (i.e., parties, lunch, dinner, etc.). Noise generated by groups of people (i.e., crowds) is dependent on several factors including vocal effort, impulsiveness, and the random orientation of the crowd members. Crowd noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking.[2] This noise level would have a +5 dBA adjustment for the impulsiveness of the noise source, and a -3 dBA adjustment for the random orientation of the crowd members.[3] Therefore, crowd noise would be approximately 62 dBA at one meter from the source (i.e., at the courtyards, balconies, terraces, and/or decks areas at the project site). Noise has a decay rate due to distance attenuation, which is calculated based on the Inverse Square Law. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source.[4] As a result, crowd noise at the nearest sensitive receptor (a residential property located 15 feet away from the nearest outdoor gathering area) would be 48.8 dBA, which is below the City's 50 dB daytime noise standard for residential properties and similar to the existing noise levels measured in the project area (48.3 dBA to 54.3 dBA, refer to Table 5). As such, project operational noise associated with outdoor gathering areas would not result in a temporary or permanent increase in ambient noise levels in excess of the City's noise standards. Thus, a less than significant impact would occur in this regard.

Mechanical Equipment

Heating Ventilation and Air Conditioning (HVAC) units would be installed on the roof and exterior sides of the proposed building. Typically, mechanical equipment noise is 55 dBA at 50 feet from the source.[5] As noted above, noise levels decrease by 6 dBA for each doubling of distance from the source. HVAC units would be located approximately 15 feet from the nearest sensitive receptor (i.e. residences to the north of the project site). As such, noise levels from the HVAC units could reach approximately 65 dBA at the nearest residences to the north without an enclosure or noise attenuation features. The HVAC units would be shielded by a mechanical screen wall in compliance with SGMC Section 130.09 (Noise Caused by Machinery) and a parapet wall which would further attenuate operational noise from the HVAC units. However, the City's exterior daytime (50 dB) and nighttime (45 dB) noise standards could be exceeded as a result of HVAC units at the project site and may result in a potentially significant impact. Therefore, Mitigation Measure NOI-2 is recommended to ensure noise levels from HVAC units would comply with the City's noise standards. Compliance with Mitigation Measure NOI-2 would result in a less than significant impact with regard to long-term operational noise from the proposed HVAC units.

Parking Areas

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, engine starting up

[2] M.J. Hayne, et al, *Prediction of Crowd Noise*, Acoustics, November 2006.

[3] *Ibid*.

[4] Cyril M. Harris, *Noise Control in Buildings*, 1994.

[5] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

and car passbys may be an annoyance to adjacent noise-sensitive receptors. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 10, *Typical Noise Levels Generated by Parking Lots*. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 48 feet for normal speech to 50 dBA at 50 feet for very loud speech.[6]

Table 10
Typical Noise Levels Generated by Parking Lots

Noise Source	Maximum Noise Levels at 50 Feet from Source
Car door slamming	63 dBA Leq
Car starting	60 dBA Leq
Car idling	53 dBA Leq
Source: Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.	

The project would provide 97 parking spaces in a fully enclosed subterranean parking garage and seven surface-level parking spaces in the open areas near the entrance to the site. As shown in Table 10, parking lot noise levels could range between 53 dBA and 63 dBA at 50 feet. The majority of parking lot noise would occur within the subterranean parking garage and would be inaudible at off-site uses. While some outdoor parking lot noise would be generated at the surface-level spaces, these noise levels would be instantaneous compared to the land use compatibility noise standards in the CNEL scale, which are averaged over time. As a result, actual noise levels over time resulting from parking lot activities would be far lower. In addition, surface parking lot noise occurs in the project vicinity under existing conditions. Therefore, the proposed parking would not result in substantially greater noise levels than currently exist at the project site. Noise associated with parking lot activities is not anticipated to exceed the City's Noise Standards or the California Land Use Compatibility Standards during operation. Therefore, noise impacts from parking lots would be less than significant.

Mitigation Measures:

NOI-1 Prior to Grading Permit issuance, the Project Applicant shall demonstrate, to the satisfaction of the San Gabriel Planning Department that the project complies with the following:

- Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other state required noise attenuation devices.

[6] Ibid.

- Property owners and occupants located within 200 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City of San Gabriel Community Development Director (or designee), prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.

- The Contractor shall provide evidence that a construction staff member shall be designated as a Noise Disturbance Coordinator and shall be present on-site during construction activities. The Noise Disturbance Coordinator shall be responsible for responding to any local complaints about construction noise. When a complaint is received, the Noise Disturbance Coordinator shall notify the City within 24-hours of the complaint and determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall implement reasonable measures to resolve the complaint, as deemed acceptable by the Community Development Director (or designee). All notices that are sent to residential units immediately surrounding the construction site and all signs posted at the construction site shall include the contact name and the telephone number for the Noise Disturbance Coordinator.

- Prior to issuance of any Grading or Building Permit, the Project Applicant shall demonstrate to the satisfaction of the Community Development Director (or designee) that construction noise reduction methods shall be used where feasible. These reduction methods include shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and electric air compressors and similar power tools.

- Construction haul routes shall be designed to avoid noise sensitive uses (e.g., residences, convalescent homes, etc.), to the extent feasible.

- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.

- Construction activities shall not take place outside of the allowable hours specified by the City's *Municipal Code* Section 150.003 (7:00 a.m. and 7:00 p.m. on weekdays and 8:00 a.m. and 4:00 p.m. on Saturdays; construction activities are not permitted on Sundays or legal holidays).

(Mitigation Measure NOI-1 correlates with Mitigation Measures N1, N2, and N3 in the Mission District Specific Plan Program EIR. This mitigation measure includes updates to reflect the latest practices and recommendations.)

NOI-2 Prior to building permit issuance, the project Applicant shall provide written proof, to the satisfaction of the Senior Building Inspector, that the proposed HVAC units are enclosed with a mechanical screen and/or contain other noise reduction features in compliance with SGMC Section 130.09 (Noise Caused by Machinery) that limit HVAC sound levels below the City's most stringent exterior noise standard of 45 dB at the nearest off-site residential property.

(Mitigation Measure NOI-2 correlates with Mitigation Measure N7 in the Mission District Specific Plan Program EIR.)

Level of Significance After Mitigation: *Less Than Significant Impact.*

NOI-2 GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

SHORT-TERM CONSTRUCTION

Project construction can generate varying degrees of groundborne vibration, depending on the construction procedure and the construction equipment used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 inch/second) appears to be conservative. The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. The vibration produced by construction equipment, is illustrated in Table 11, *Typical Vibration Levels for Construction Equipment*.

Table 11
Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 15 feet (inches/second)[1]	Approximate peak particle velocity at 26 feet (inches/second)[1]	Approximate peak particle velocity at 50 feet (inches/second)[1]	Approximate peak particle velocity at 100 feet (inches/second)[1]
Large bulldozer	0.192	0.084	0.031	0.011
Loaded trucks	0.164	0.072	0.027	0.010
Small bulldozer	0.007	0.003	0.001	0.000
Jackhammer	0.075	0.033	0.012	0.004

Notes:
1. Calculated using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 7-4 of the FTA *Transit Noise and Vibration Impact Assessment Manual*
D = the distance from the equipment to the receiver

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

Groundborne vibration decreases rapidly with distance. As indicated in Table 11, based on the FTA data, vibration velocities from typical heavy construction equipment operation that would be used during project construction range from 0.007 to 0.192 in/sec peak particle velocity (PPV) at 15 feet from the source of activity. The nearest off-site structure (a residence to the north of the project site) is located approximately 15 feet from proposed construction activities. Therefore, vibration from construction activities experienced at the nearest structure (residence to the north of the project site) would be below the 0.20 inch-per-second PPV significance threshold. Thus, a less than significant impact would occur in this regard.

LONG-TERM OPERATIONAL IMPACTS

The project proposes residential uses that would not generate groundborne vibration that could be felt at surrounding uses. The proposed project would not involve railroads or substantial heavy truck operations, and therefore would not result in vibration impacts at surrounding uses. No impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: *Less Than Significant Impact.*

NOI-3

- ***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, EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS?***

Level of Significance Before Mitigation: *No Impact.*

SHORT-TERM CONSTRUCTION

The proposed project is not located within an airport land use plan. There is no public airport, public use airport, or private airstrip located within two miles of the project site. The proposed project would not expose people residing or working in the area to excessive noise levels. Therefore, impacts in this regard would be less than significant.

LONG-TERM OPERATIONAL IMPACTS

Refer to the discussion above. The proposed project is not located within an airport land use plan and there is no public airport, public use airport, or private airstrip located within two miles of the project site.

Mitigation Measures**:** No mitigation measures are required.

Level of Significance After Mitigation: *No Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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Faye Stroud, Graphics

6.2 DOCUMENTS

1. City of San Gabriel, *Comprehensive General Plan of the City of San Gabriel, May 18, 2004*.

2. City of San Gabriel, *Mission District Specific Plan*, August 2004.

3. City of San Gabriel, *Mission District Specific Plan Environmental Impact Report*, July 2004.

4. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

5. Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.

6. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

7. Harris, Cyril, *Handbook of Noise Control*, 1979.

8. Harris, Cyril, *Noise Control in Buildings*, 1994.

9. M.J. Hayne, et al, *Prediction of Crowd Noise*, Acoustics, November 2006.

10. State of California, Governor's Office of Planning and Research, *General Plan Guidelines*, October 2003.

11. Traffic Design, Inc., *Arroyo Village Development Traffic Impact Study*, June 20, 2019.

12. U.S. Department of Transportation, *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, updated August 24, 2017, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed on June 26, 2019.

13. U.S. Environmental Protection Agency, *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*, October 1979 (revised July 1981).

14. U.S. Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, November 1979.

6.3 SOFTWARE/WEBSITES

Google Earth, 2019.

APPENDIX

APPENDIX A: NOISE MEASUREMENT DATA

Site Number: Arroyo Village Site 1	
Recorded By: Eddie Torres	
Job Number: 172409	
Date: 5/01/19	
Time: 11:22 a.m.	
Location: Cul-de-sac of Vega Street	
Source of Peak Noise: Birds	

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
48.3	36.2	66.6	80.8

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**3011133**	**04/08/2019**	
	Microphone	**Brüel & Kjær**	**4189**	**3086765**	**04/08/2019**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**25380**	**04/08/2019**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**04/08/2019**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset =		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (inches)**
	1.3	73.2°	29.4

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 4.7.4
Start Time:		05/01/2019 11:22:23
End Time:		05/01/2019 11:32:23
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		142.09

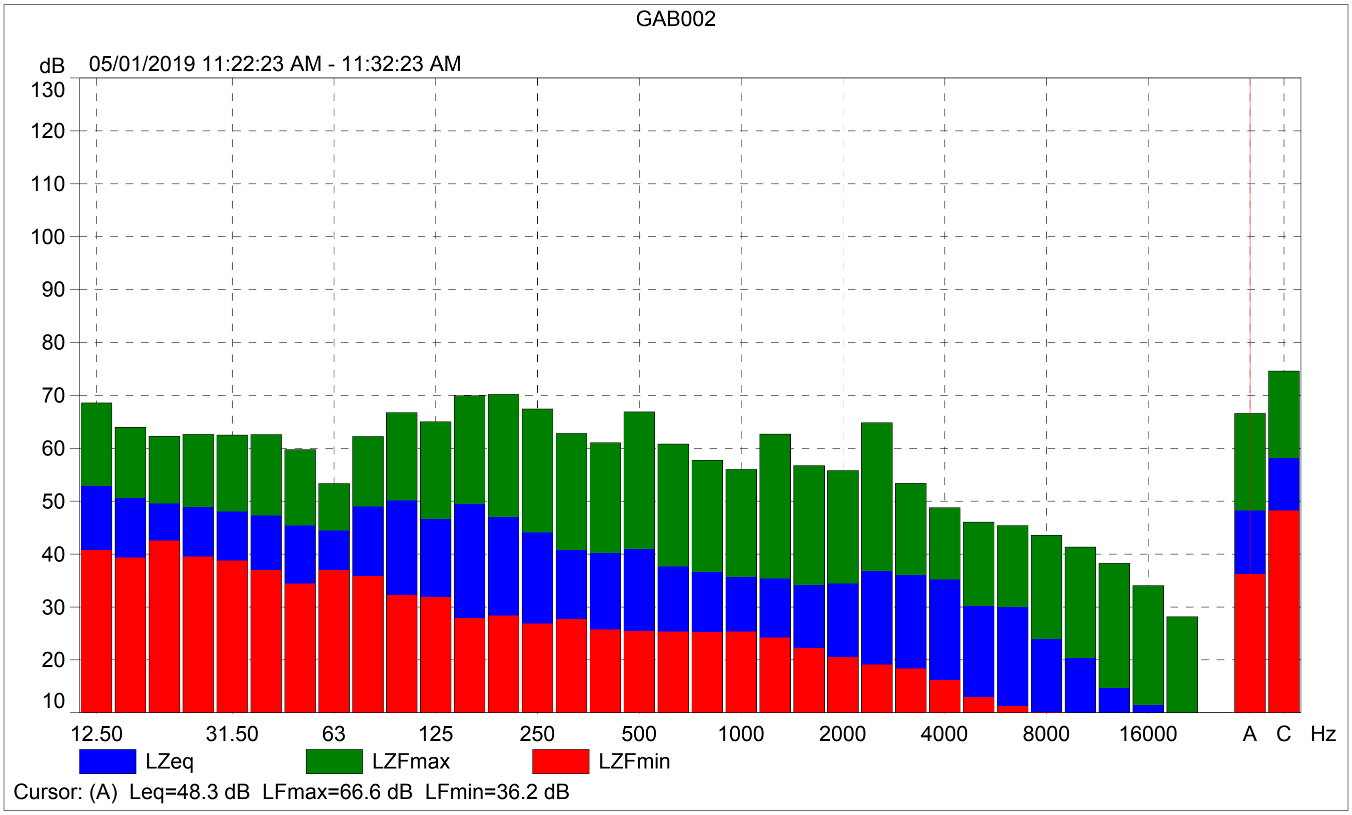
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		A
Spectrum:	FS	Z

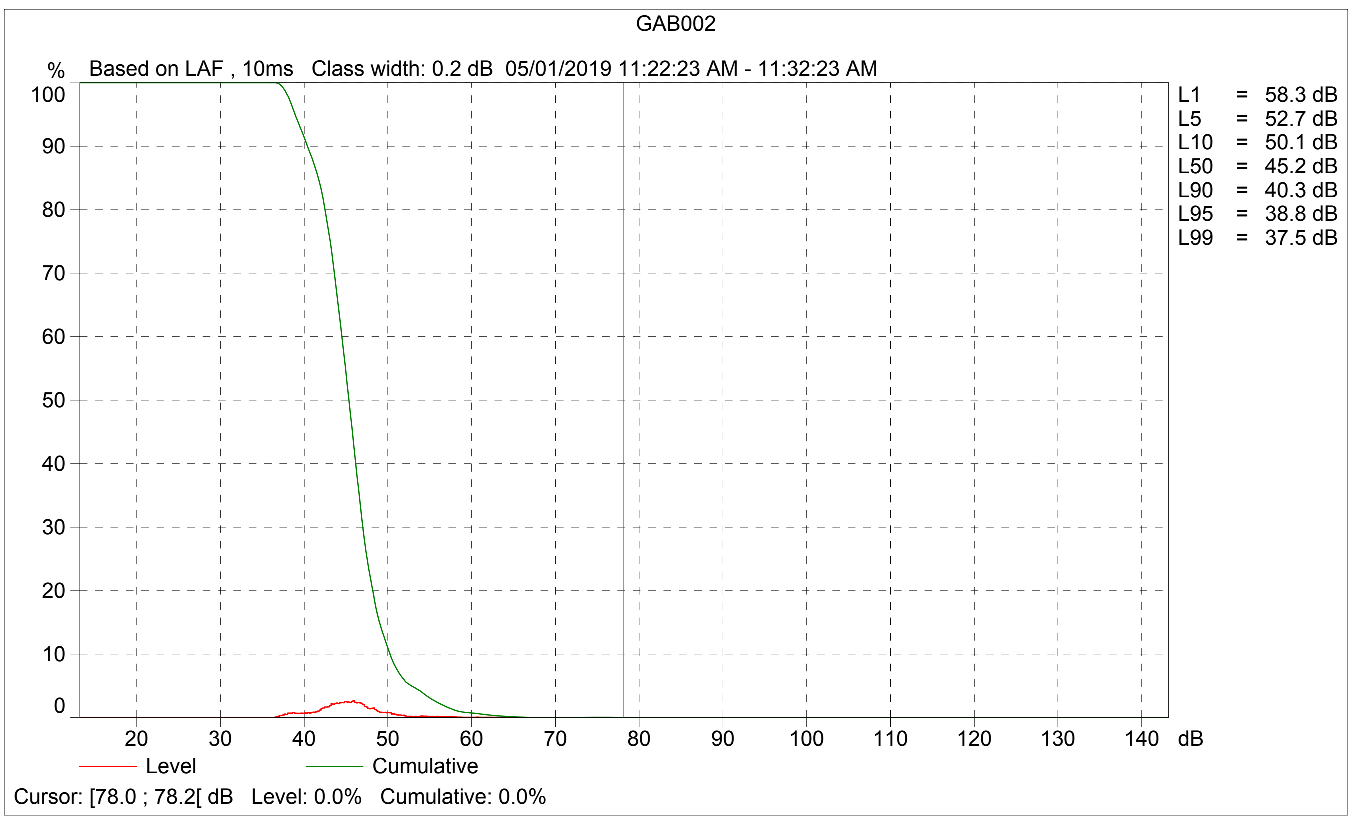
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Free-field

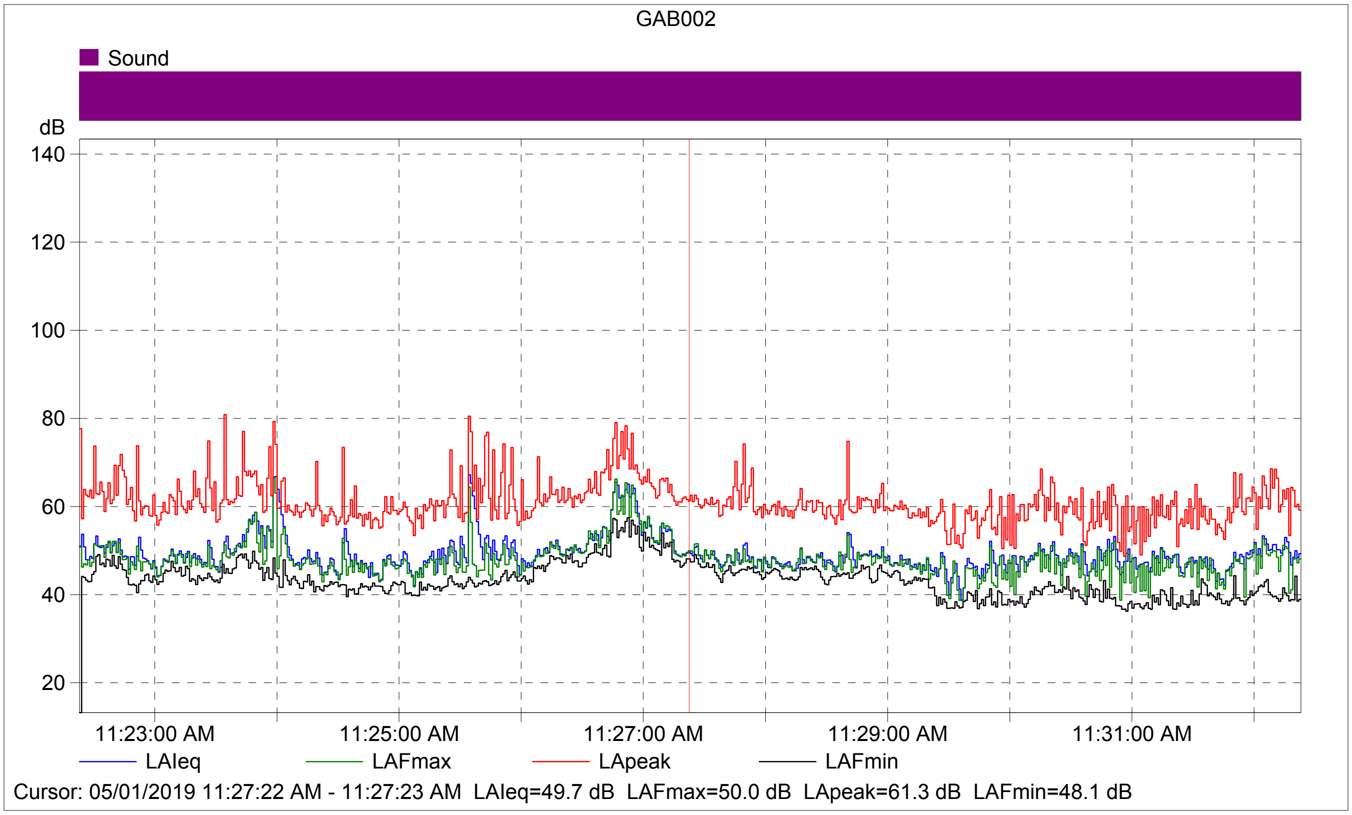
Calibration Time:		05/01/2019 08:45:22
Calibration Type:		External reference
Sensitivity:		43.7693409621716 mV/Pa

GAB002

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	48.3	66.6	36.2
Time	11:22:23 AM	11:32:23 AM	0:10:00				
Date	05/01/2019	05/01/2019					


GAB002
dB 05/01/2019 11:22:23 AM - 11:32:23 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.3 dB LFmax=66.6 dB LFmin=36.2 dB

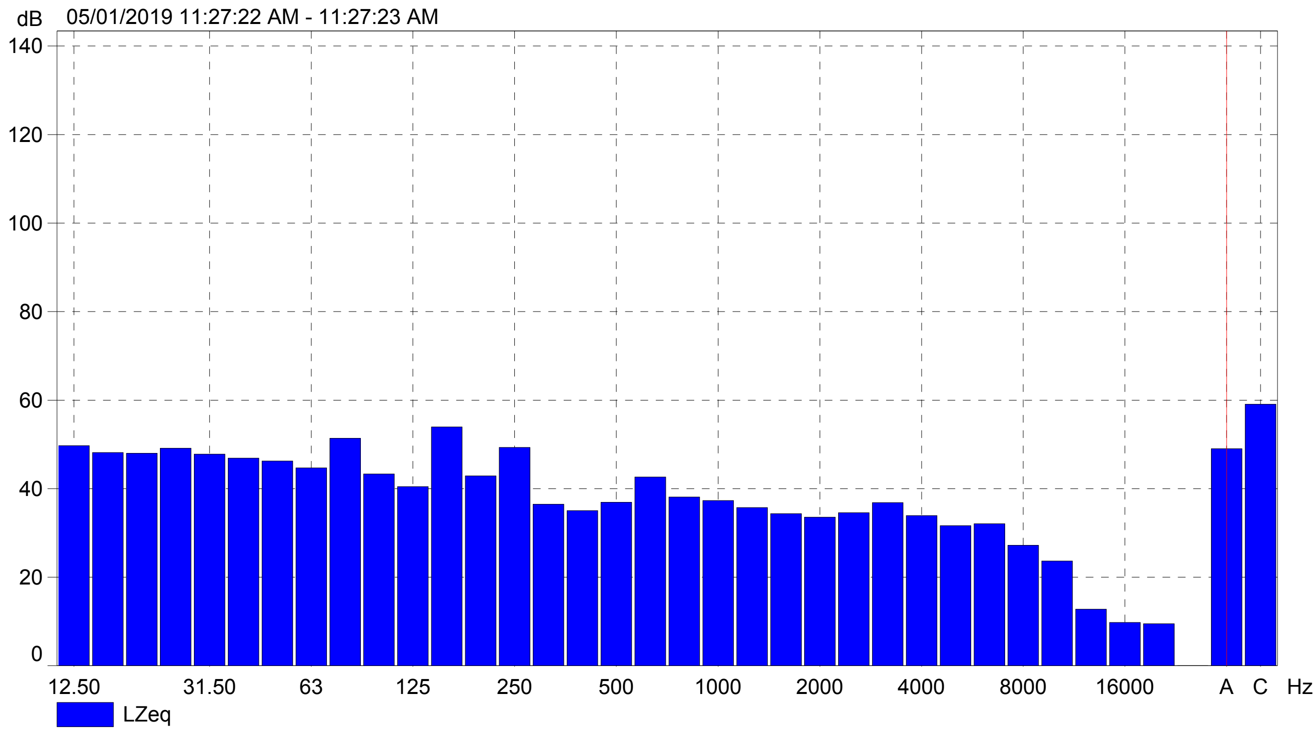

GAB002
% Based on LAF , 10ms Class width: 0.2 dB 05/01/2019 11:22:23 AM - 11:32:23 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 58.3 dB
L5 = 52.7 dB
L10 = 50.1 dB
L50 = 45.2 dB
L90 = 40.3 dB
L95 = 38.8 dB
L99 = 37.5 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%



GAB002

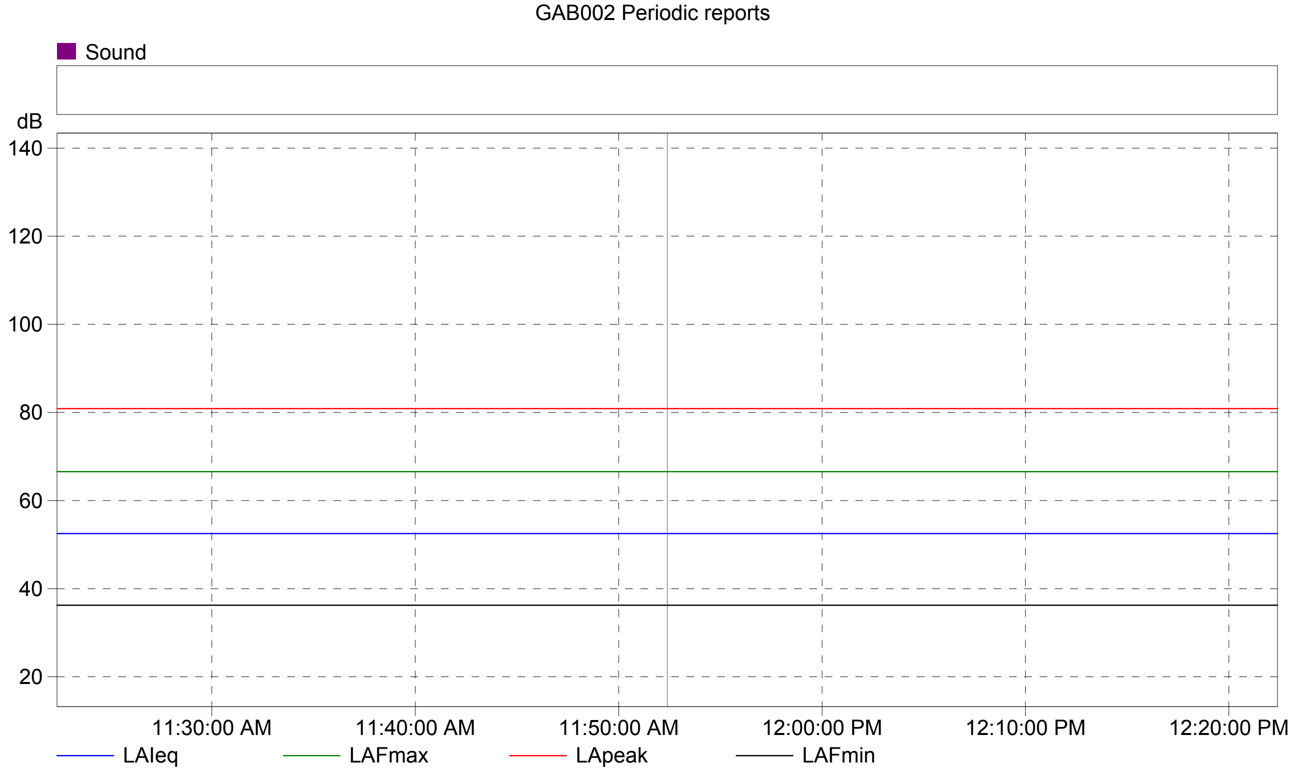
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			49.7	50.0	48.1
Time	11:27:22 AM	0:00:01			
Date	05/01/2019				

GAB002



Cursor: (A) Leq=49.0 dB

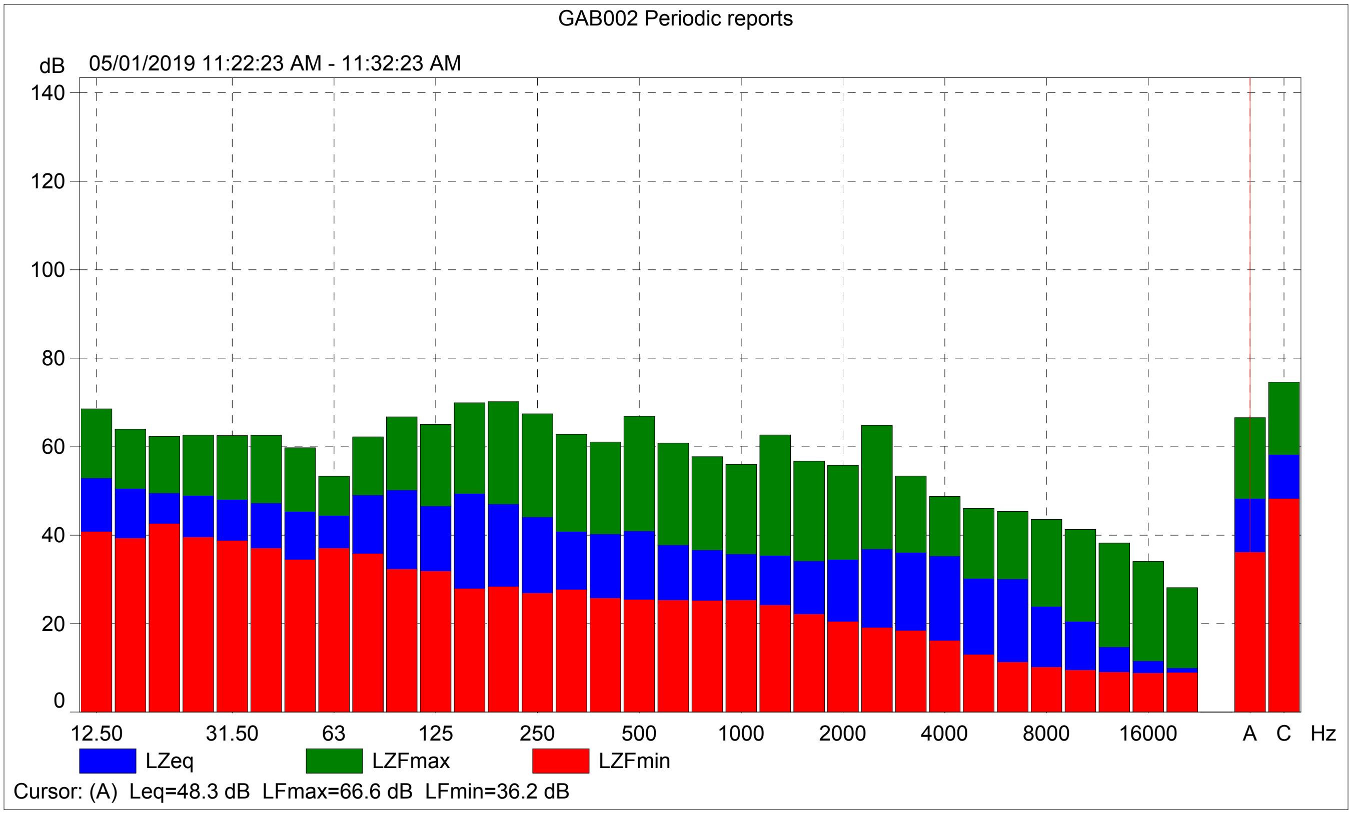
GAB002 Periodic reports

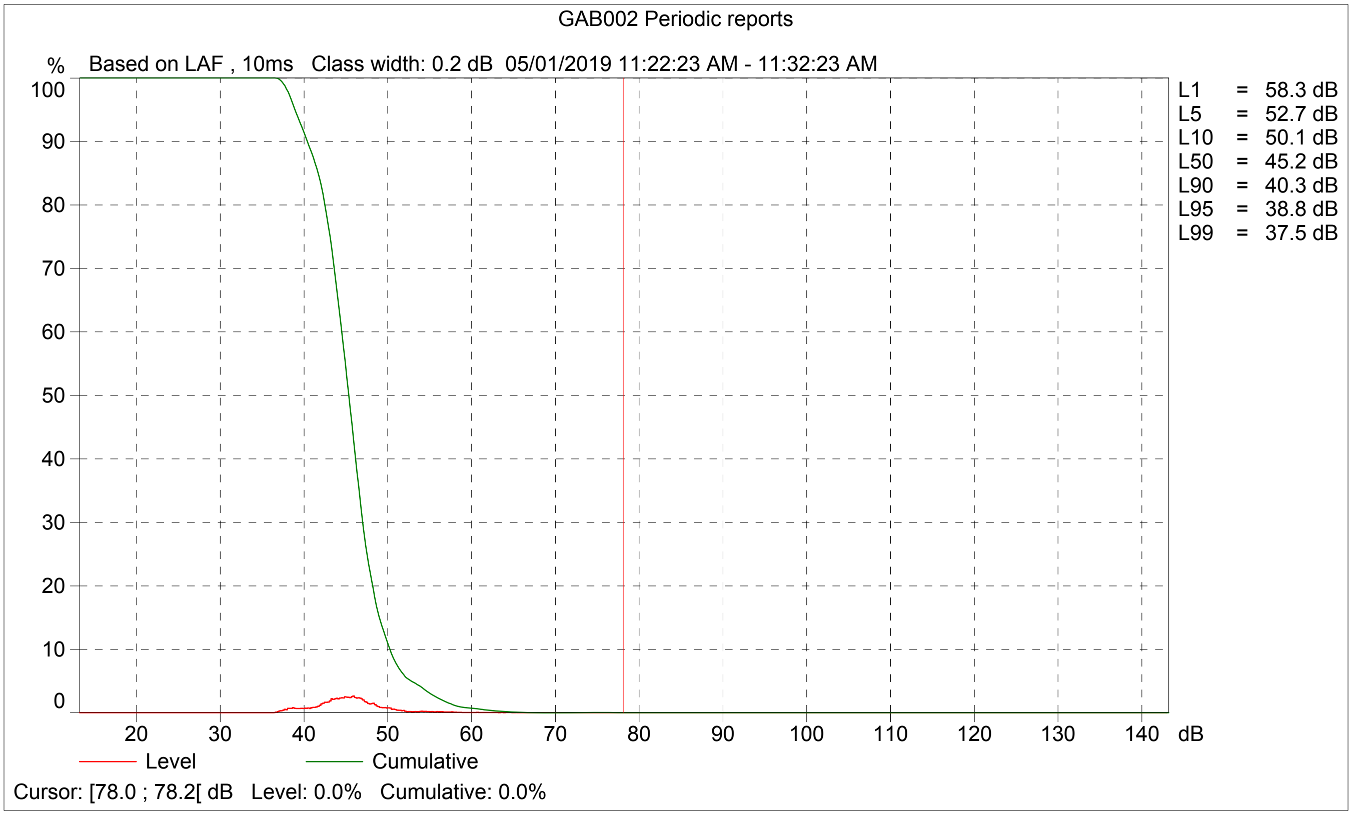


Cursor: 05/01/2019 11:22:23 AM - 12:22:23 PM LAIeq=52.5 dB LAFmax=66.6 dB LApeak=80.8 dB LAFmin=36.2 dB

GAB002 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	52.5	66.6	36.2
Time	11:22:23 AM	0:10:00				
Date	05/01/2019					





GAB002 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 05/01/2019 11:22:23 AM - 11:32:23 AM
100
90
80
70
60
50
40
30
20
10
0
20 30 40 50 60 70 80 90 100 110 120 130 140 dB
L1 = 58.3 dB
L5 = 52.7 dB
L10 = 50.1 dB
L50 = 45.2 dB
L90 = 40.3 dB
L95 = 38.8 dB
L99 = 37.5 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%

Site Number: Arroyo Village Site 2			
Recorded By: Eddie Torres			
Job Number: 172409			
Date: 5/01/2019			
Time: 10:59 a.m.			
Location: Corner of Carillo Drive and South Arroyo Drive.			
Source of Peak Noise: Traffic			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
54.3	34.5	76.4	75.1

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**3011133**	**04/08/2019**	
	Microphone	**Brüel & Kjær**	**4189**	**3086765**	**04/08/2019**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**25380**	**04/08/2019**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**04/08/2019**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset =		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (inches)**
	1 mph	74°	29.40

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 4.7.4
Start Time:		05/01/2019 10:59:27
End Time:		05/01/2019 11:09:54
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		142.09

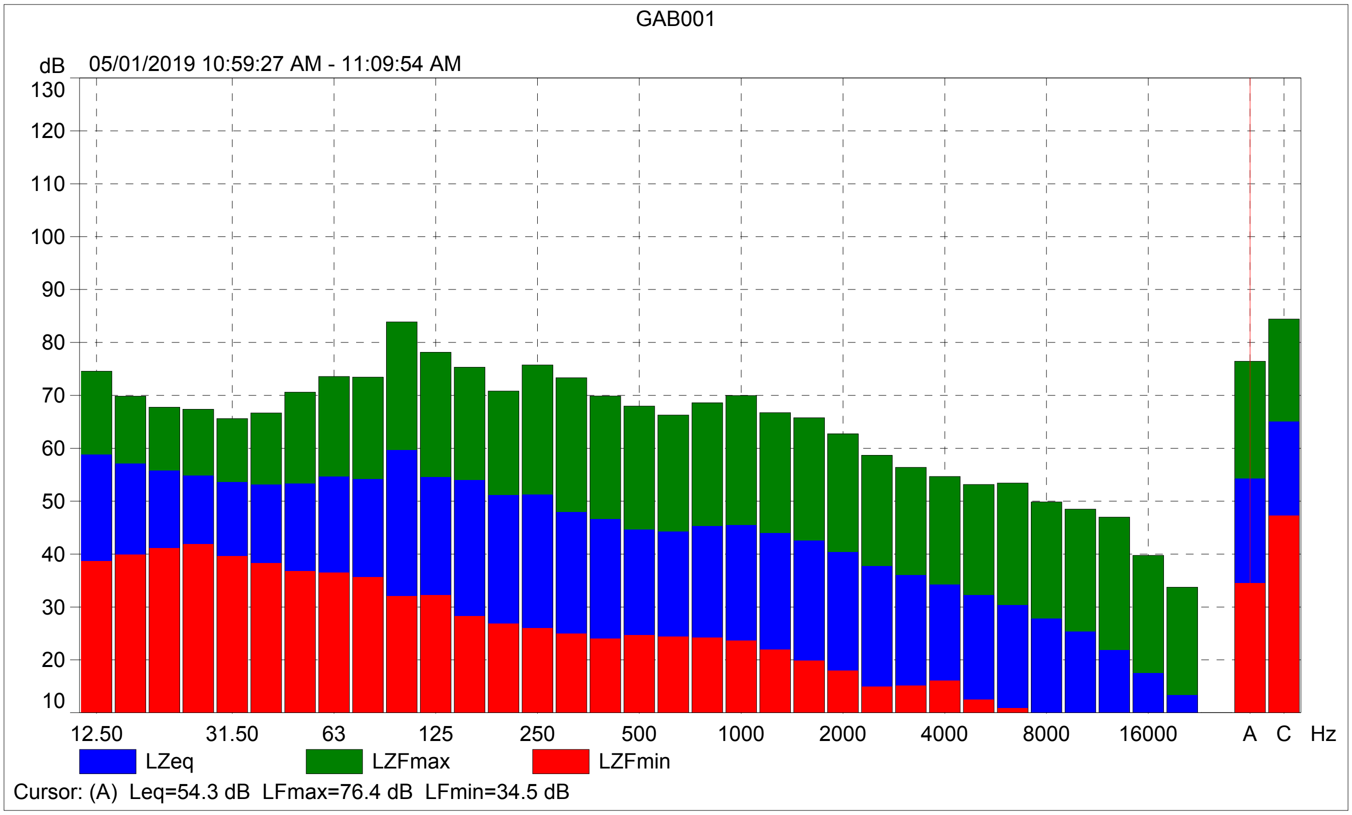
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		A
Spectrum:	FS	Z

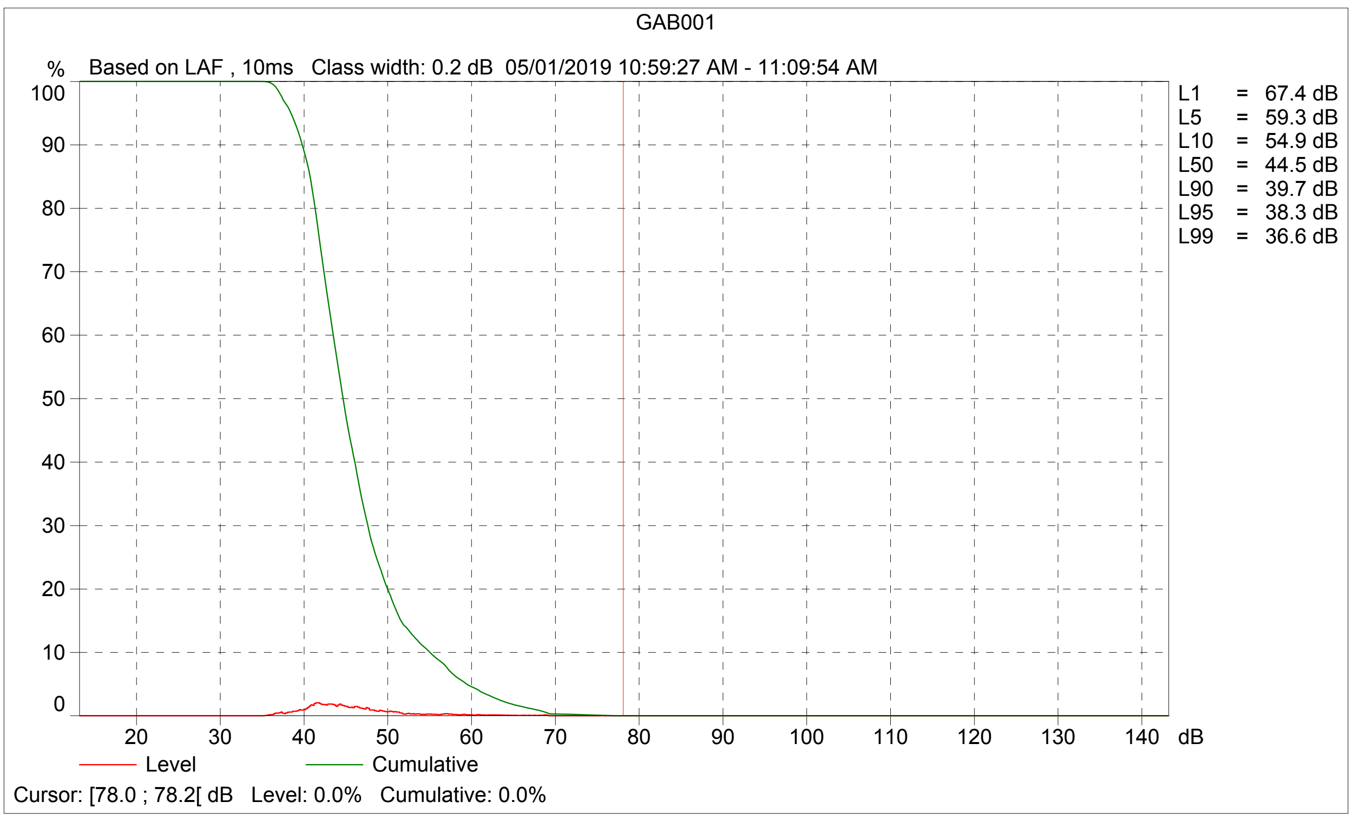
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Free-field

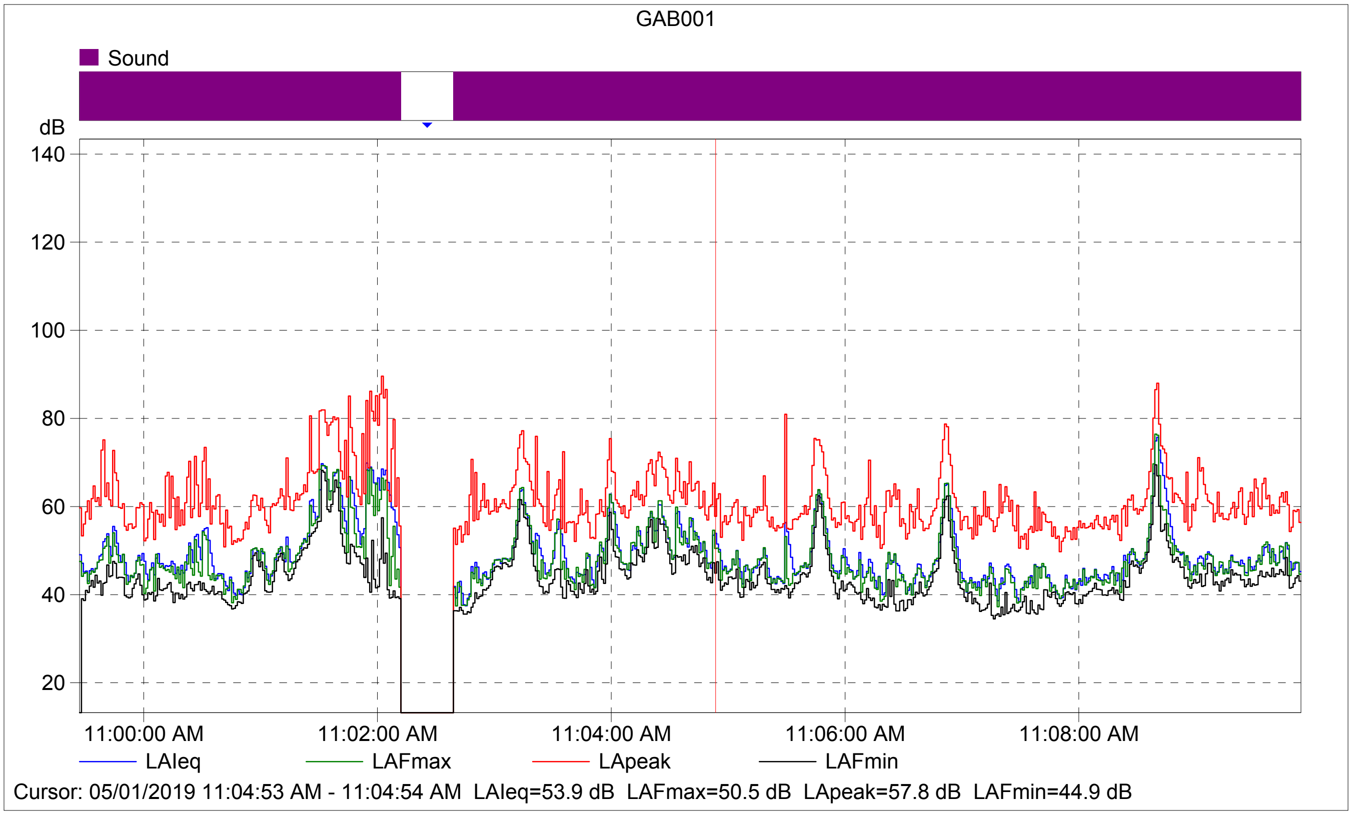
Calibration Time:		05/01/2019 08:45:22
Calibration Type:		External reference
Sensitivity:		43.7693409621716 mV/Pa

GAB001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	54.3	76.4	34.5
Time	10:59:27 AM	11:09:54 AM	0:10:00				
Date	05/01/2019	05/01/2019					

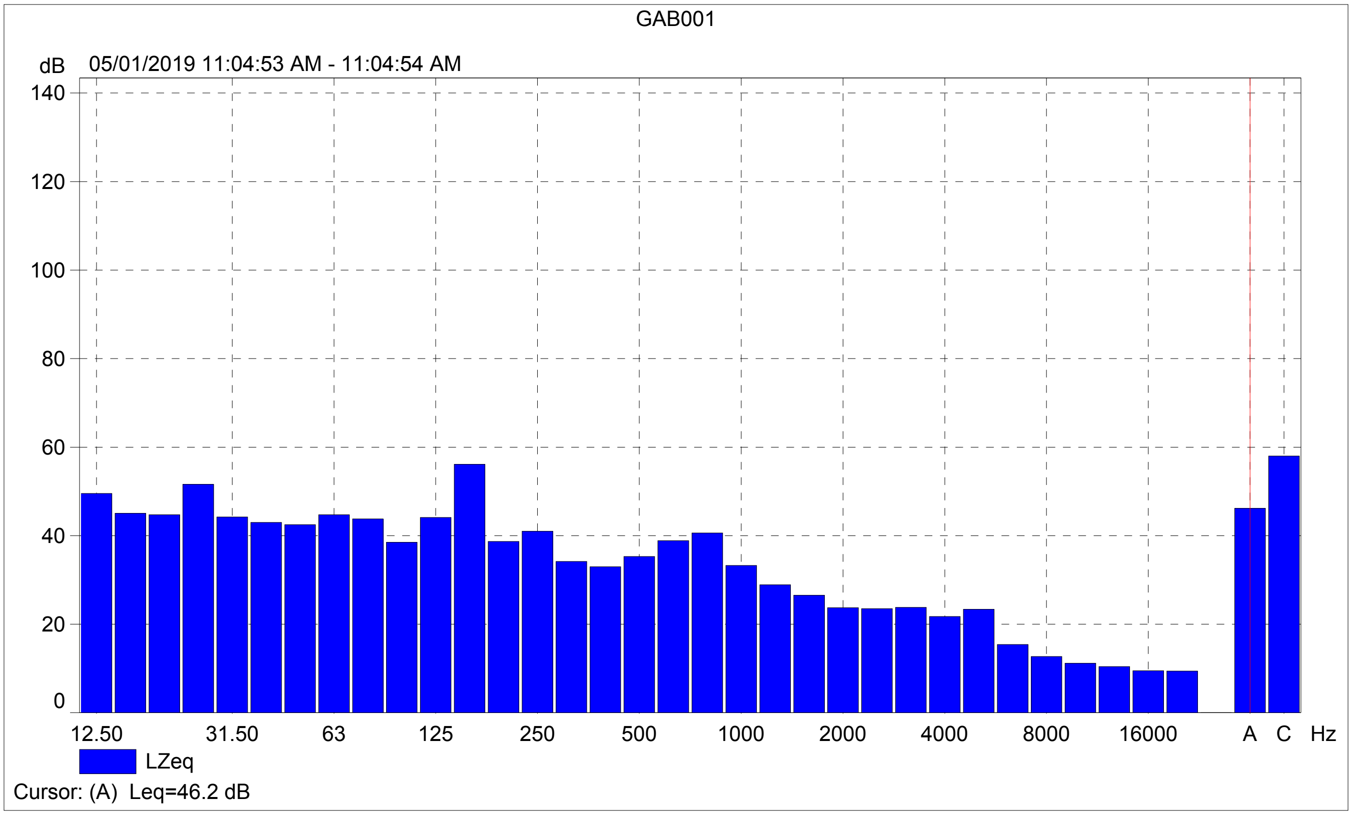

GAB001
dB 05/01/2019 10:59:27 AM - 11:09:54 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=54.3 dB LFmax=76.4 dB LFmin=34.5 dB

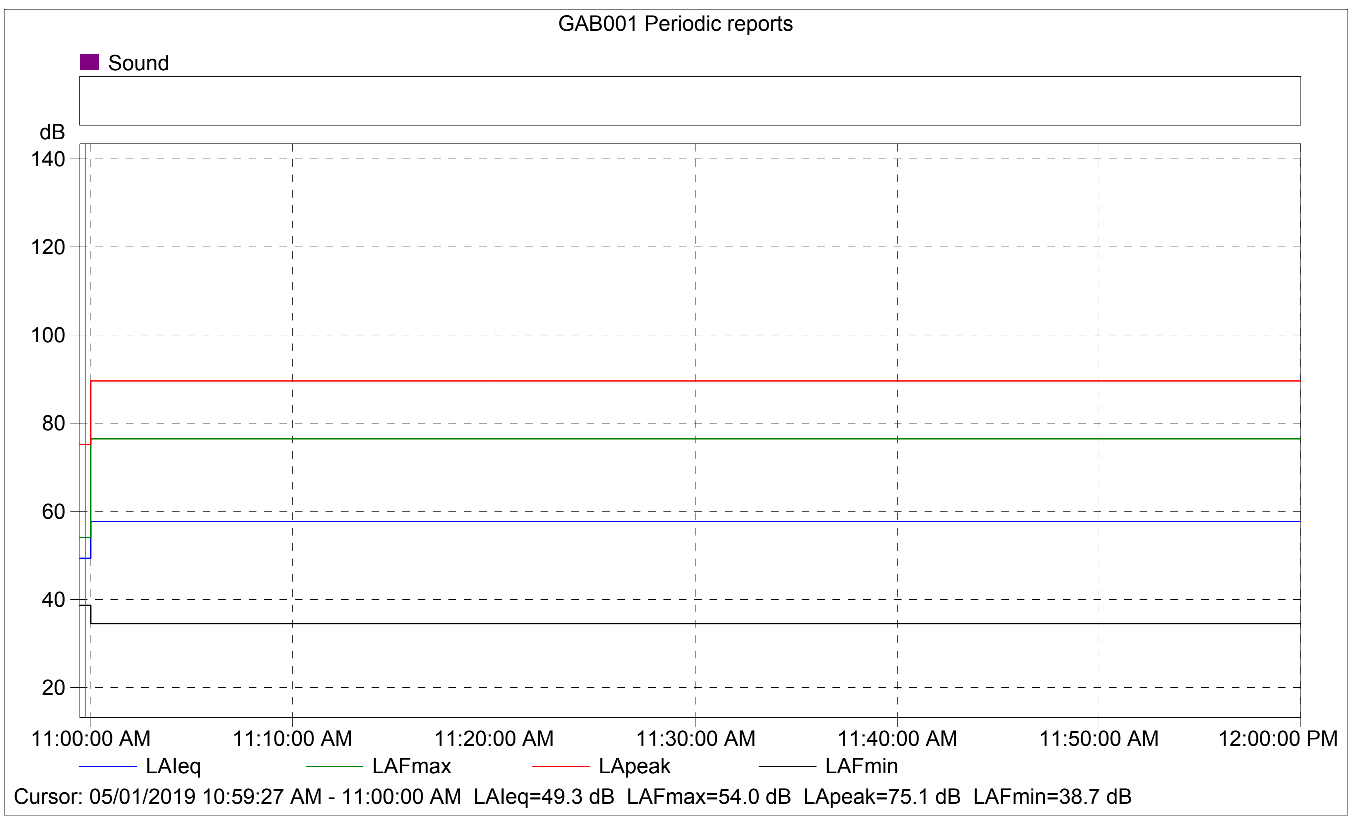

GAB001
% Based on LAF , 10ms Class width: 0.2 dB 05/01/2019 10:59:27 AM - 11:09:54 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 67.4 dB
L5 = 59.3 dB
L10 = 54.9 dB
L50 = 44.5 dB
L90 = 39.7 dB
L95 = 38.3 dB
L99 = 36.6 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%



GAB001

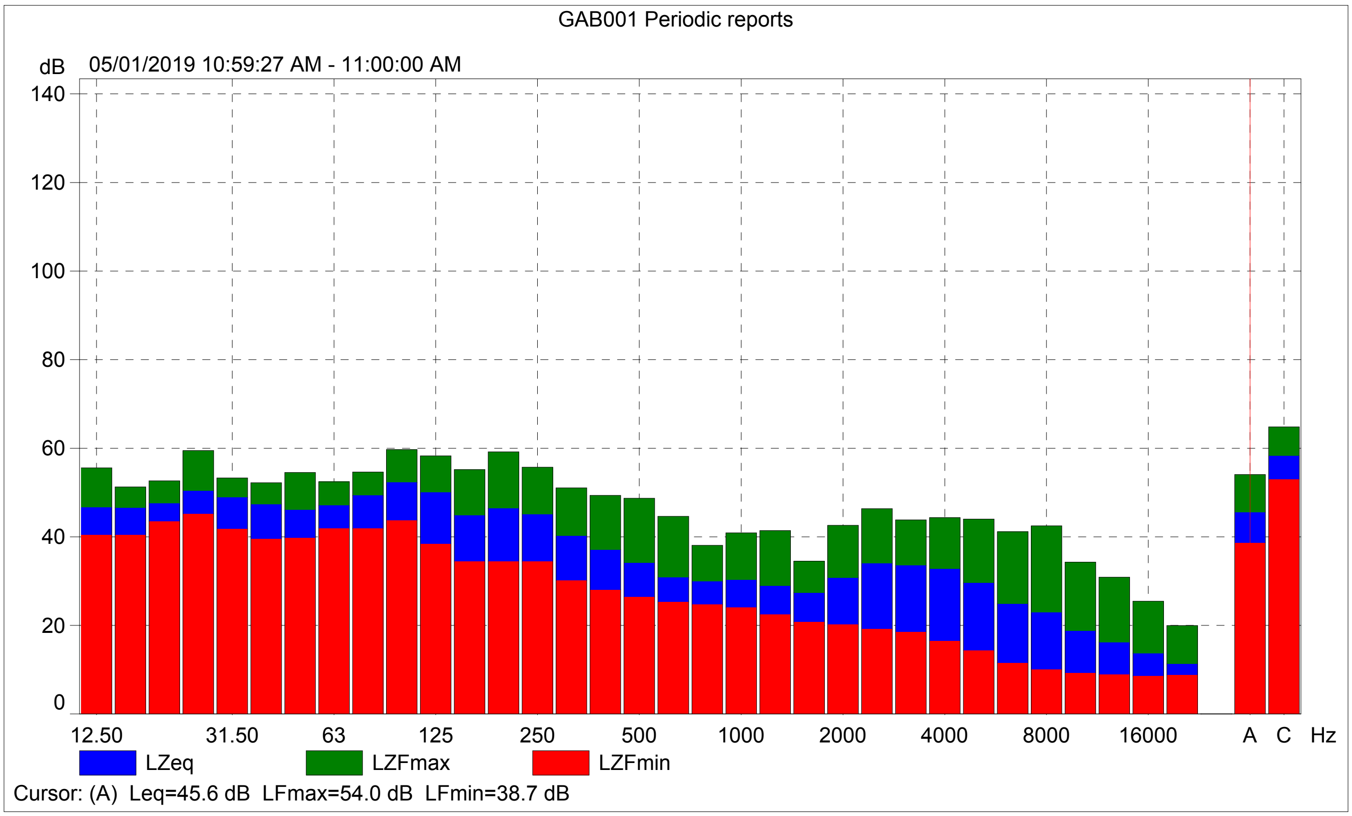
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			53.9	50.5	44.9
Time	11:04:53 AM	0:00:01			
Date	05/01/2019				


GAB001
dB 05/01/2019 11:04:53 AM - 11:04:54 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=46.2 dB

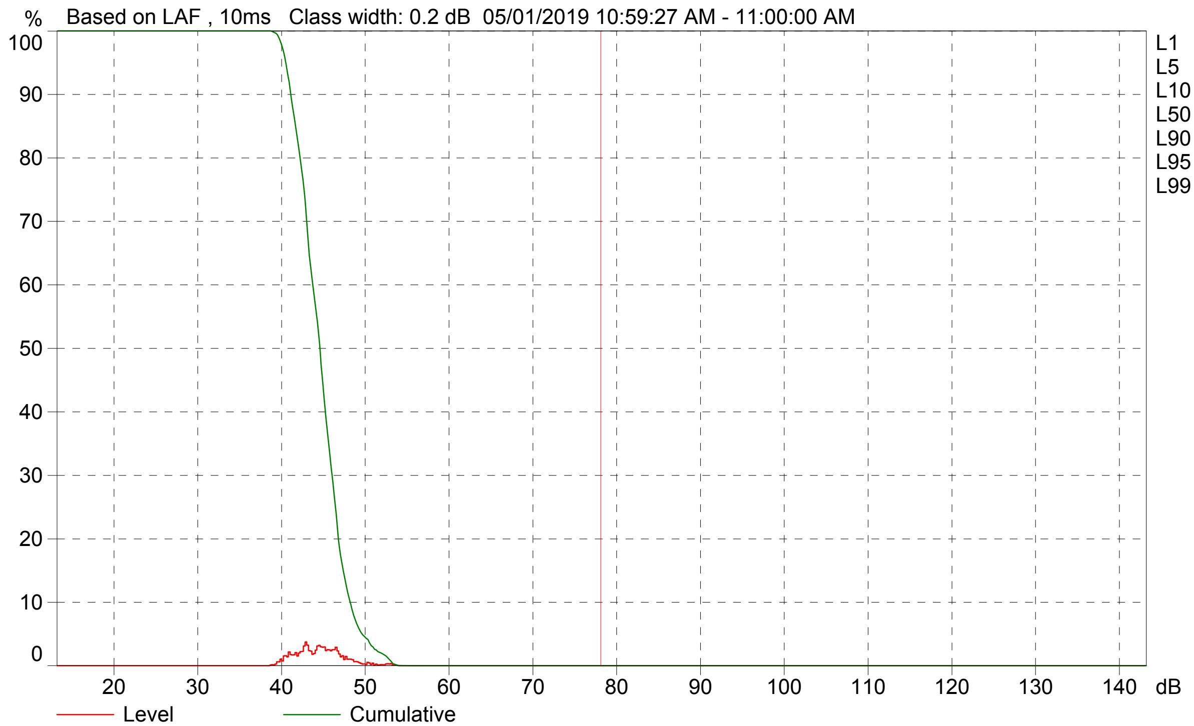

GAB001 Periodic reports
Sound
dB
140
120
100
80
60
40
20
11:00:00 AM
11:10:00 AM
11:20:00 AM
11:30:00 AM
11:40:00 AM
11:50:00 AM
12:00:00 PM
LAIeq
LAFmax
LApeak
LAFmin
Cursor: 05/01/2019 10:59:27 AM - 11:00:00 AM LAIeq=49.3 dB LAFmax=54.0 dB LApeak=75.1 dB LAFmin=38.7 dB

GAB001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	49.3	54.0	38.7
Time	10:59:27 AM	0:00:33				
Date	05/01/2019					



GAB001 Periodic reports



L1 = 52.7 dB
L5 = 49.5 dB
L10 = 48.1 dB
L50 = 44.4 dB
L90 = 41.0 dB
L95 = 40.4 dB
L99 = 39.5 dB

Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.0%

APPENDIX I
Traffic Impact Study

TRA IC IMPACT STUDY

ARROYO ILLAGE CONDO DE ELOPMENT

235 ARROYO DRI E

SAN GABRIEL, CALI ORNIA

♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦

Prepared for

ARROYO ILLAGE DE ELOPMENT
2345 Longden Drive
San Marino, CA 91108

Attn: Mr. Jack Lac, Project Manager
Cell: 626-524-5519
Email: jlac6485@yahoo.com

♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦

Prepared by

Traffic Design, Inc.
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Tel: 626-826-7560

Under the Supervision of:
M. Yunus Rahi, Ph.D, P.E
Registered Civil and Traffic Engineer

June 20, 2019
TDI2019-07/MYR

PREPARER'S CERTIFICATION

TRA IC IMPACT STUDY
ARROYO ILLAGE CONDO DE ELOPMENT
235 ARROYO DRI E
SAN GABRIEL, CALI ORNIA

This is to certify that the above titled traffic study has been prepared under the supervision of M. Yunus Rahi, Ph.D, PE, TE a California Registered Professional Engineer in civil and traffic engineering.

06/20/2019

M. Yunus Rahi, Ph.D, PE, TE   Date   Professional Engineer's Stamps

TRA IC IMPACT STUDY
ARROYO ILLAGE CONDO DE ELOPMENT
235 ARROYO DRI E
SAN GABRIEL, CALI ORNIA

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TRA IC IMPACT STUDY
ARROYO ILLAGE CONDO DE ELOPMENT
235 ARROYO DRI E
SAN GABRIEL, CALI ORNIA

EXECUTIVE SUMMARY

The proposed project will be located at 235 Arroyo Drive on the west side of the Alhambra Wash near the intersection of Arroyo Drive and Mays Alley in the City of San Gabriel. Access will be provided via a bridge over the wash which will make the west leg of the intersection of Arroyo Drive and Mays Alley. The project, herein referred to as Arroyo Village, will consist of developing a total of 41 (forty-one) 2 to 4-bedroom condominium units. The facility will provide 97 parking spaces in the basement and 7 parking spaces in the open areas (a total of 104 spaces) for use by residents and guests. The project is anticipated to generate approximately 238 daily trips with 18 trips during the AM peak hour (3 entering and 15 exiting) and 21 trips during the PM peak hour (14 entering and 7 exiting). According to the “Traffic Study Guidelines for Development Projects in the City of San Gabriel,” a traffic impact study shall be conducted for any development that is proposed to generate over 50 AM or 50 PM peak hour trips and/or located within 300 feet of a major or secondary arterial street. Although this project does not exceed the standard criteria, the City asked that a traffic study be prepared based on prevailing conditions. A traffic impact study was originally prepared for a project on this site in 2004 and revised in 2007 and 2014. A change in project density and use, along with probable changes in traffic volume and roadway conditions required that a new traffic impact study be conducted.

The study objectives for this report include:

- Evaluation of existing traffic conditions in the vicinity of the site with a determination of traffic volumes and level of service (LOS) without the project.
- Evaluation of traffic conditions with the addition of project traffic and traffic generated from ambient traffic growth as well as the addition of any related projects within the projects vicinity.
- Identification of mitigation measures to reduce project’s impacts, if any.

The study includes an evaluation of existing and future traffic conditions at the following three key intersections:

1. Arroyo Drive and Carillo Drive
2. Mission Drive and Carrillo Drive
3. Arroyo Drive and Santa Anita Street

Trip generation rates for the project are based on nationally recognized recommendations contained in the publication “Trip Generation” manual, 9th Edition, published by the Institute of Transportation Engineers (ITE). ITE’s “Trip Generation” manual 10^{th} Edition does not provide rates anymore for this specific Residential Condominium/Townhouses land use. The rates provided for ITE Land Use Code 230: Residential Condominiums/Townhouses in the 9^{th} Edition are deemed appropriate for this project. Accordingly, the project is anticipated to generate approximately 238 daily trips with 18 trips during the AM peak hour (3 entering and 15 exiting) and 21 trips during the PM peak hour (14 entering and 7 exiting). This volume of traffic (approximately 1 vehicle every 2 minutes) is not considered to be an excessive increase of traffic for adjacent streets.

The analysis indicates that all of the studied intersections currently operate at an acceptable level of service (i.e., at LOS D or better) during both the AM and PM peak hours of an average weekday. These intersections will continue to operate at acceptable conditions with the addition of traffic to be generated from the project and 7 other known related projects within the area. Traffic from the project is not expected to significantly impact any of the intersections analyzed. Therefore, no off-site mitigation measures are deemed necessary for the development of the project.

The project’s access road (a bridge over Alhambra Wash) will connect to Arroyo Drive at its intersection with Mays Alley. The access road must be adequately designed to provide the basic clear width and vertical clearance requirements for Fire truck access. The access road, as designed, is wider than the twenty feet clear width requirements and provides a minimum of thirteen feet six inches of vertical clearance. Fire lanes should be indicated with appropriate signage, pavement markings and curb painting to maintain access. Turn radius for fire trucks should be approved by the City’s Fire department.

TRA IC IMPACT STUDY
ARROYO ILLAGE CONDO DE ELOPMENT
235 ARROYO DRI E
SAN GABRIEL, CALI ORNIA

INTRODUCTION

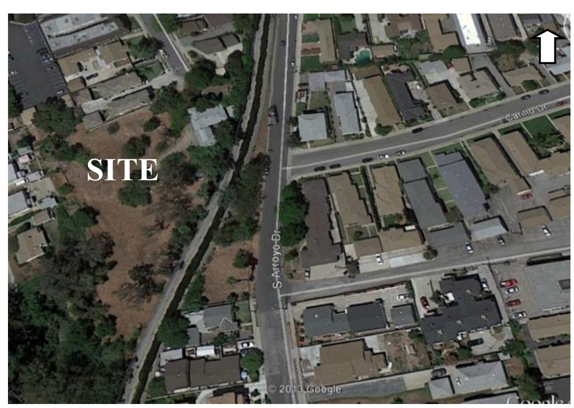
The purpose of this traffic study is to analyze traffic impacts on the surrounding circulation system from the proposed Arroyo Village Condo Project. The project development will be comprised of a total of 41 (forty-one) 2 to 4-bedroom condominium units. The facility will provide 97 basement parking spaces and 7 open parking spaces (a total of 104 spaces) for residents and guests. The daily and peak hour traffic volume to be generated by the project has been estimated and distributed to the local street system and their impact at the key intersections in the vicinity of the project has been analyzed.

The following material sets forth a detailed project description, an analysis of existing 2019 traffic conditions, the estimated trip generation by the project, trip distribution and assignment, an assessment of future 2021 conditions with an ambient growth rate as well as several related projects and the impacts of this traffic on the key intersections.

This study has been prepared in accordance with the City of San Gabriel's traffic study guidelines[1] and consistent with the Los Angeles County Congestion Management Program[2].

PROJECT DESCRIPTION AND SITE ACCESS

The proposed project is located at 235 Arroyo Drive on the west side of the Alhambra Wash at its intersection with Mays Alley in the City of San Gabriel. The lot is approximately 1.116 acres in size and will be comprised of 41 (forty-one) 2 to 4-bedroom condominium units and referred to herein as Arroyo Village. The development will have 4 floors for living and a basement level for parking. The facility will provide 97 basement parking spaces and 7 open parking spaces for residents and guests for a total of 104 spaces. City code requires a total of 97 spaces. Access will be provided via a bridge over the wash to make the



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[1] *Traffic Study Guidelines for Development Projects in the City of San Gabriel, September 26, 2006.*
[2] *2010 Congestion Management Program for Los Angeles County, LA County MTA.*

west leg of the intersection of Arroyo Drive and Mays Alley. ***Figure A*** shows the project location and general vicinity. ***Figure B*** shows the proposed site plan.

The site is zoned R-3 and is surrounded on the north, south and west by other multi-unit developments and single family and multi-family homes to the east. The project is considered to be within the Mission District Specific Plan. There is on-street parking along Arroyo Drive. Although the development will be located on the west side of the Alhambra Wash, all access will be provided east of the site onto Arroyo Drive. As shown on ***Figure B***, the access driveway will provide for one entrance and one exit lane as well as a pedestrian walkway. The project's site plan shows an emergency exist gate providing access to Hampton Court on the west side of Alhambra Wash.

EXISTING CIRCULATION SYSTEM AND TRAFFIC VOLUMES

Access to the site will be from local streets, Arroyo Drive to Carillo Drive or to Santa Anita Street. Regional access to the project site will be provided by a network of City streets. Major north-south access will be provided by Mission Drive while major east-west access will be provided by Santa Anita Street and Mission Road. ***Figure C*** shows the streets roadway designations.

The following is a brief description of these roadways:

Mission Drive: Mission Drive is a north-south Secondary Arterial with two lanes of travel in each direction near Carillo Drive. North of Broadway no on-street parking is permitted on either side of the street. There is a raised center median on Mission Drive limiting access to side streets. On Mission Drive between Broadway and Santa Anita is angled parking and the road narrows to one lane in each direction.

Santa Anita Street: Santa Anita Street is considered an east-west Limited Secondary Arterial with one lane in each direction. At Arroyo Drive it is 40 feet wide with 2 hour parking on both sides of the street. Santa Anita has a posted speed of 25 mph. Land use is commercial, industrial with some multifamily units.

Arroyo Drive: is considered a north-south local street which carries one lane in each direction with no center stripe. The street extends between Padilla Street on the north and Santa Anita Street on the south. The intersection of Arroyo Drive and Santa Anita Street is controlled by a Stop sign placed on Arroyo Drive.

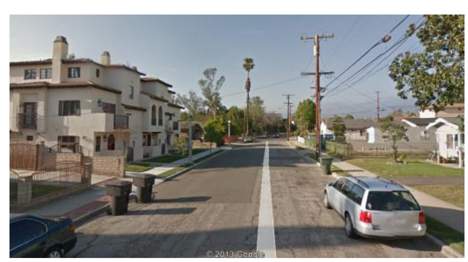


Figure A: Project Location and Vicinity

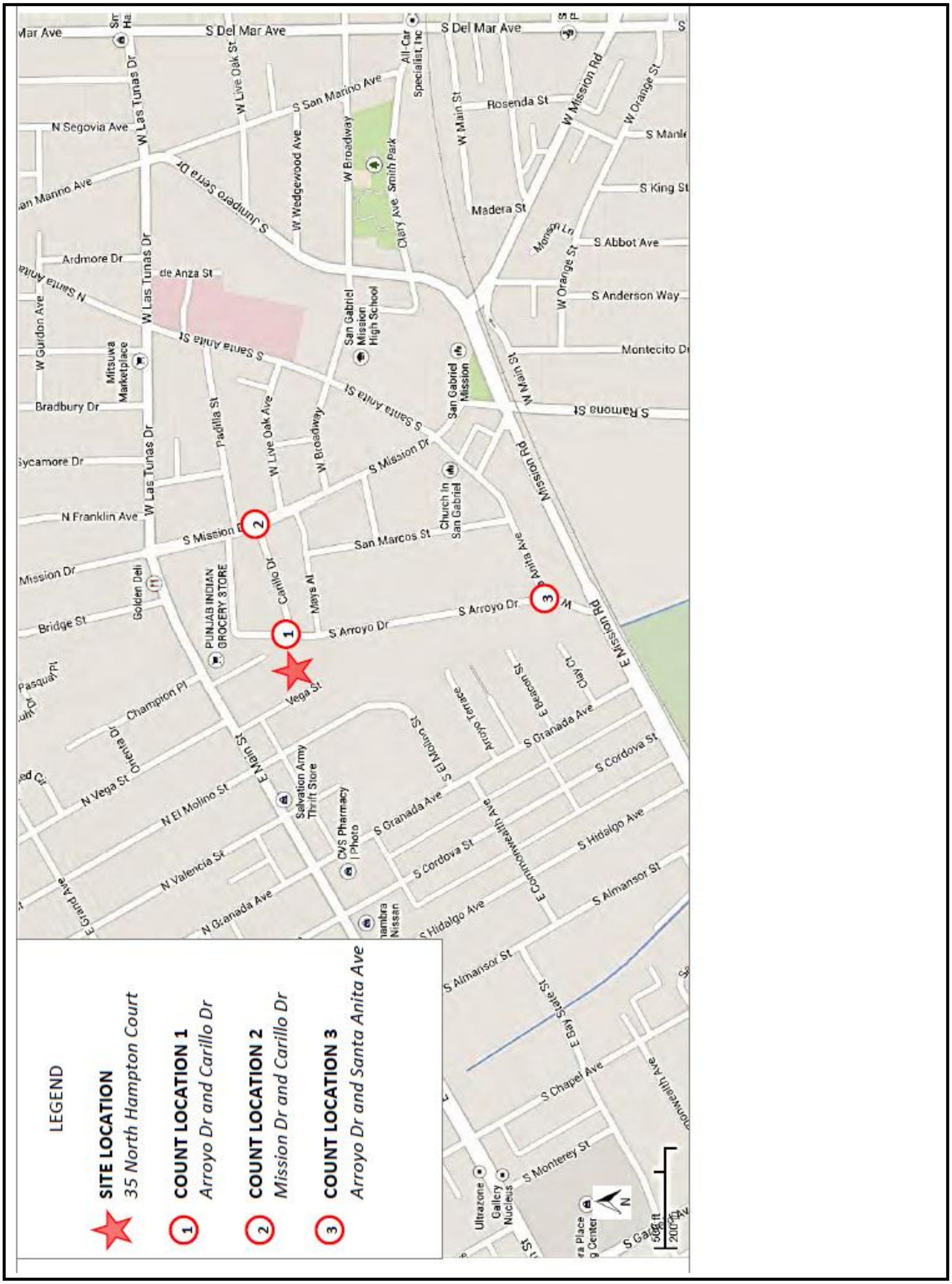


Figure B: Site Plan

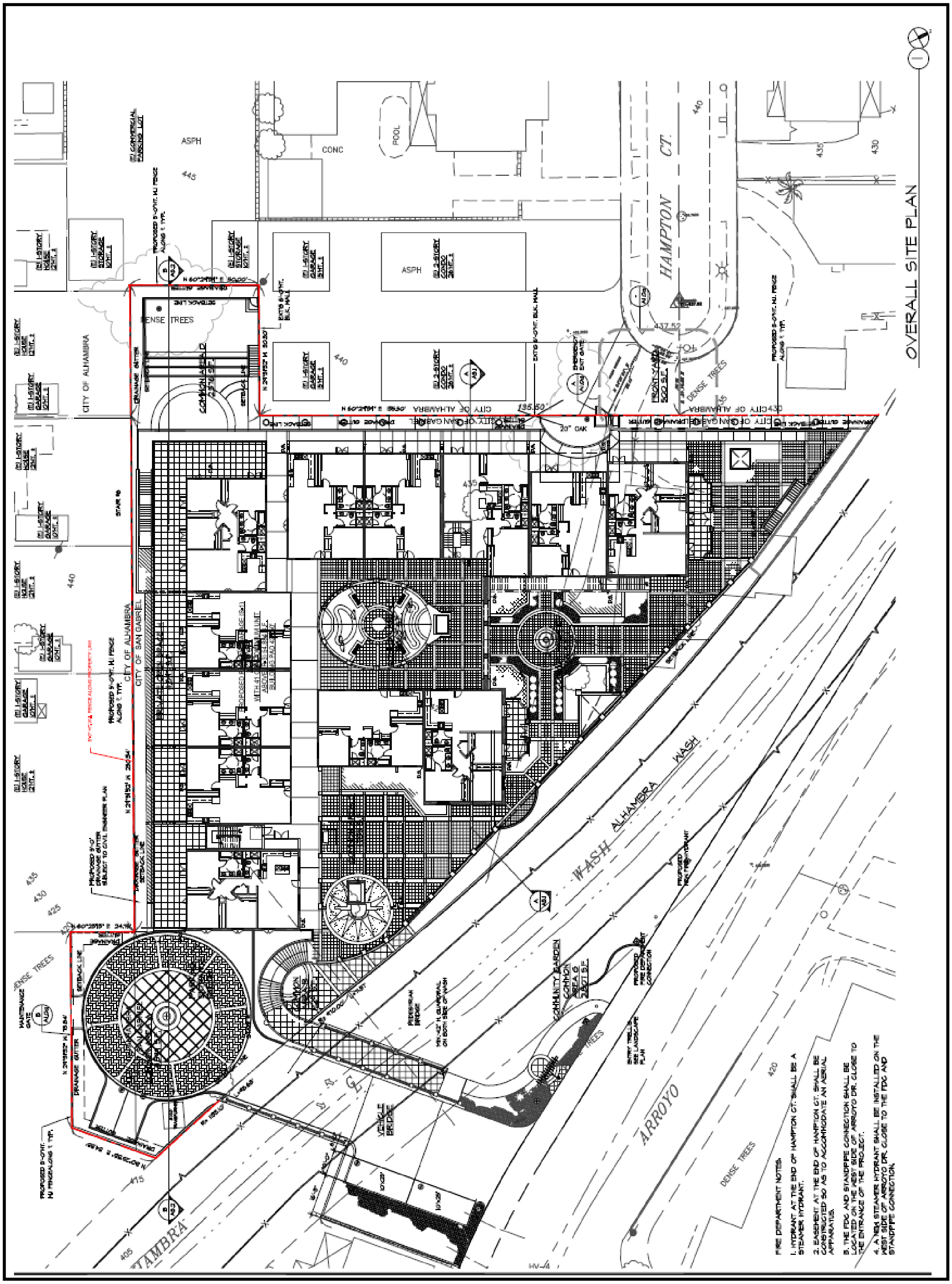


Figure C: Existing Street Classification

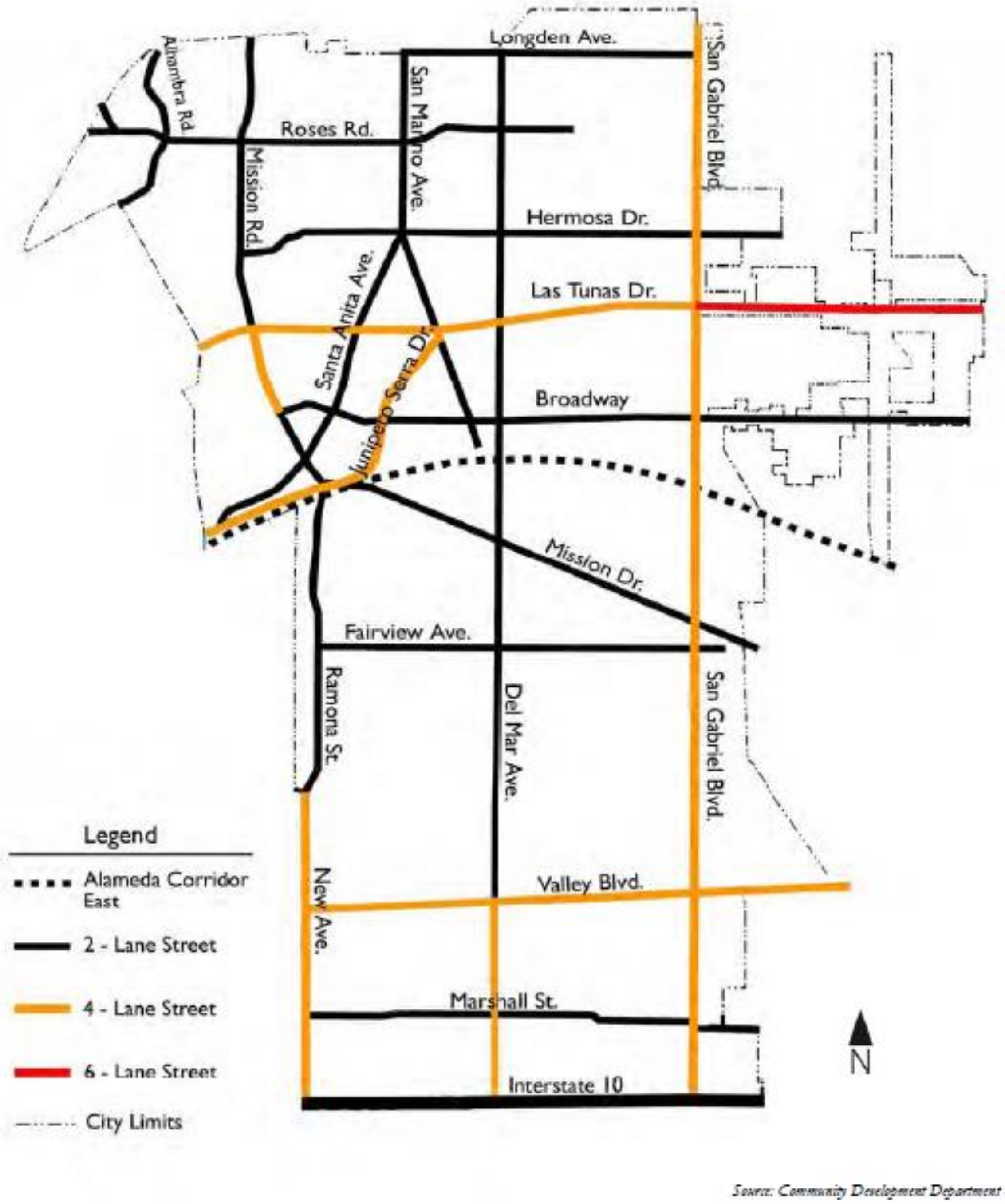


Figure 3-1

EXISTING STREET DESIGN CLASSIFICATION

Comprehensive General Plan, City of San Gabriel

There is heavy on-street parking as Arroyo Drive nears Santa Anita Street. At the project's driveway, Arroyo Drive is 34 feet wide with parking on both sides. Land use along the street is apartments, multi-unit detached and single family houses. Arroyo Drive has a prima facie speed limit of 25 mph.

Carillo Drive: Carillo Drive is a 36' wide local east-west street connecting Mission Drive on the east with Arroyo Drive on the west. The street provides one lane of travel in each direction. The intersection of Carillo Drive and Mission Drive is controlled by a Stop sign placed on Carillo Drive. There is a raised median on Mission Drive which prevents traffic from entering into Carillo Drive from the northbound direction. Traffic can only turn right from Carillo Drive to Mission Drive. Parking is allowed on both sides of the street. Land use is apartments, single family and multi-family units.

Mays Alley: will lie opposite the proposed project's driveway. The alley is approximately 24 feet wide with access to the garages of the apartments and other housing units. There is no parking in the alley.

EXISTING TRAFFIC COUNTS

Existing traffic counts were taken and used as the base for all of the analysis. A total of three key intersections were identified to analyze the performance of the circulation system under existing as well as future traffic conditions with and without the project. These key intersections are:

1. Arroyo Drive and Carillo Drive
2. Mission Drive and Carillo Drive
3. Arroyo Drive and Santa Anita Street

The counts were conducted during the month of May 2019. A field investigation was conducted as well at these locations to obtain existing lane configuration and traffic control information.

Figure D illustrates existing lane configurations and ***Figure E*** shows existing traffic volumes at during the AM and PM peak hours.

Detailed traffic count information is placed in the Technical Appendix.

Figure D: Existing Intersection Lane Configuration

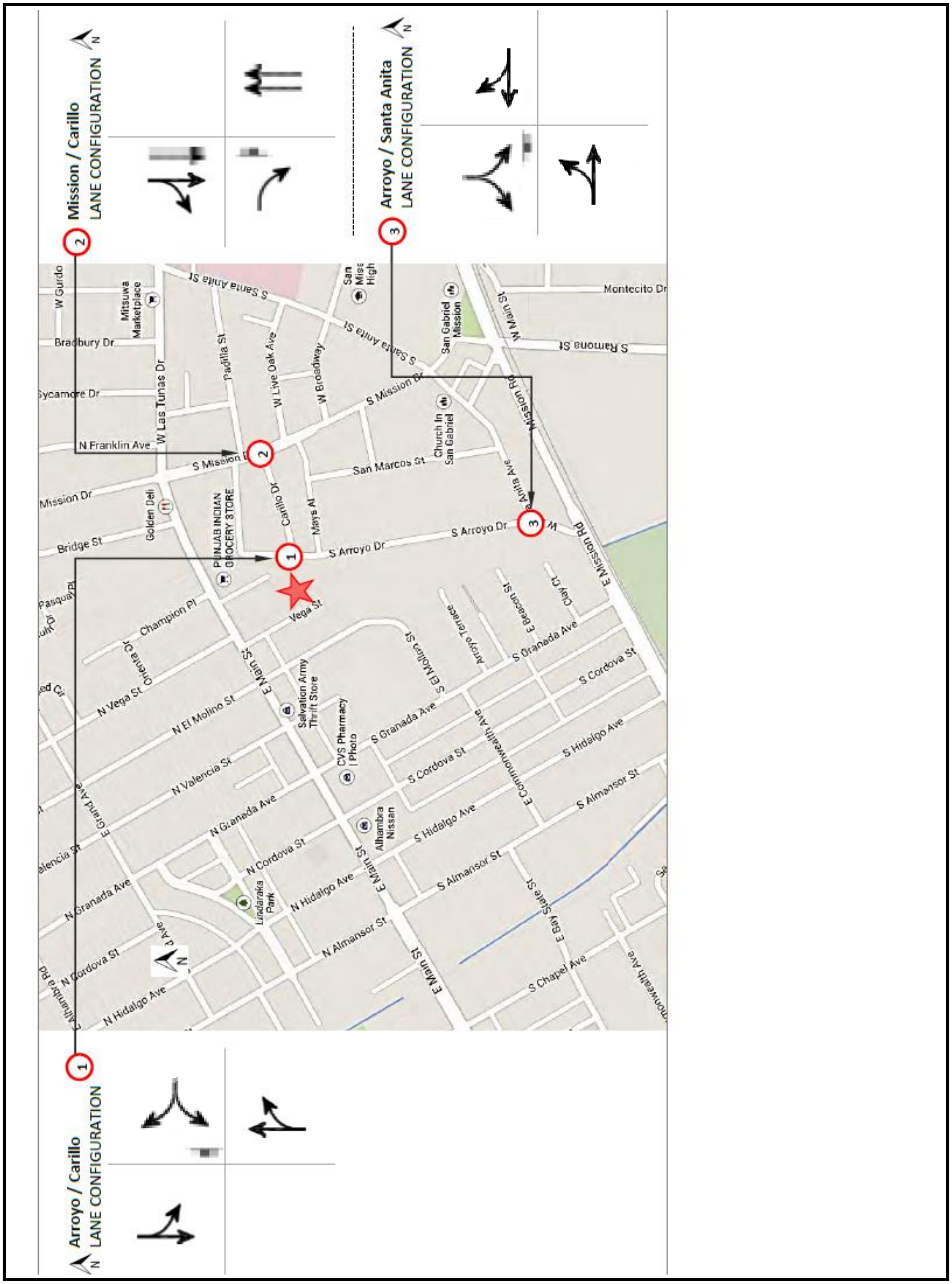
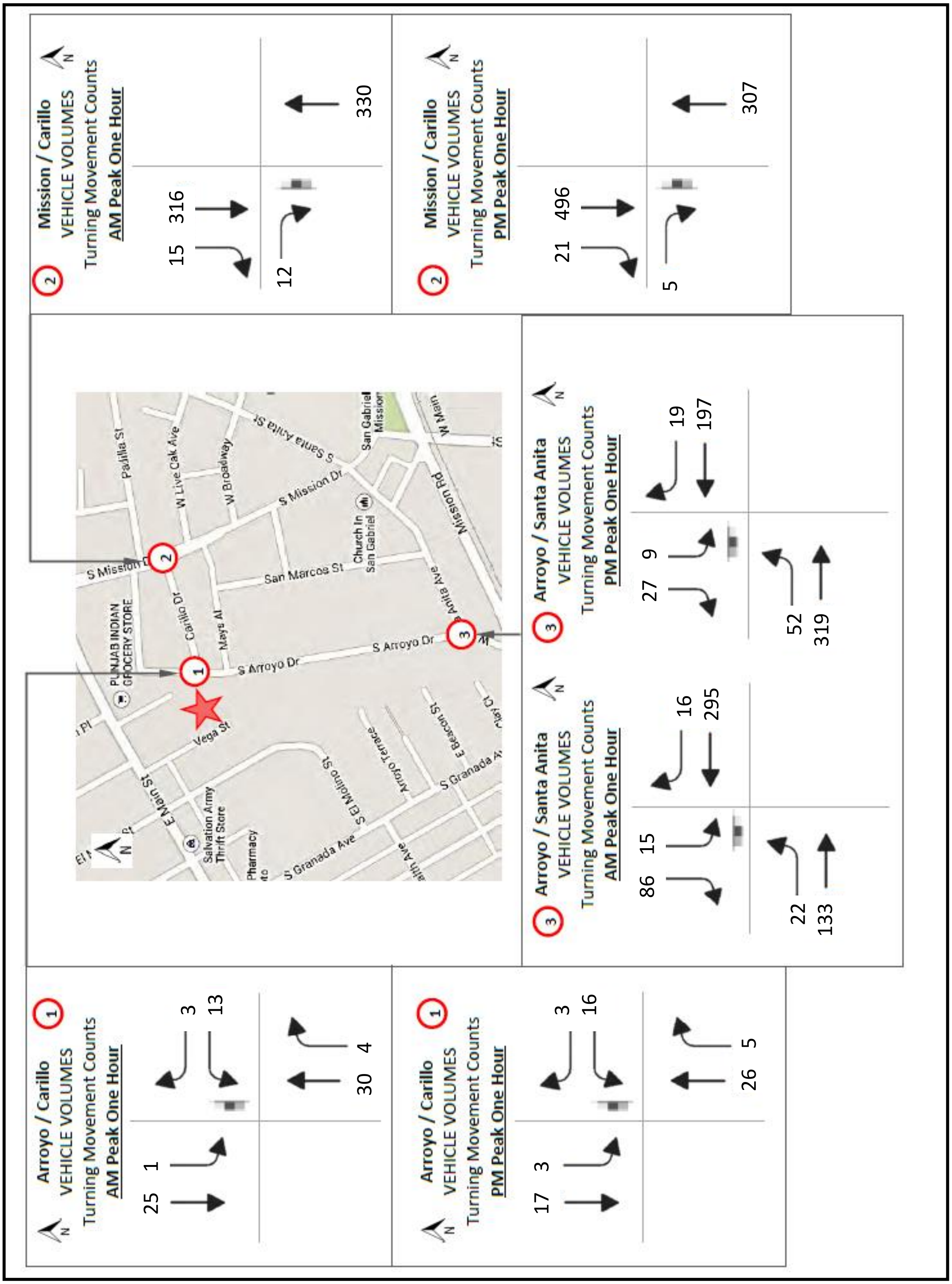


Figure E: Existing 2019 AM and PM Peak Hour Volumes at Key Intersections



LEVEL OF SERVICE (LOS) CRITERIA

For this analysis the 2010 Highway Capacity Manual (HCM) operational delay method was used in conducting intersection LOS calculations. In this analysis, Synchro software was used to conduct the required LOS calculations in a format compatible with City requirements. The HCM defines level of service as a qualitative measure, which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate Level of Service (LOS) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. ***Table 1*** provides a brief description of the Level of Service from A to F[3]. Any V/C ratio greater than 1.0 is an indication of actual or potential breakdown, representing little available capacity in the critical movements to absorb demand increases.

TABLE 1
Intersection Level of Service Definitions

"LOS A describes operations with very low delay, up to 10 seconds per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 seconds per vehicle for signalized intersections. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

LOS C describes operations with delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 seconds per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 seconds per vehicle. This level, considered to be unacceptable to most drivers, often occurs with over saturation, when arrival flow rates exceed the capacity of the intersection. It may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels." [1]

[3] 2010 Highway Capacity Manual, Chapter 9.

The average total delay per vehicle for the overall intersection is usually expressed in terms of seconds. The thresholds shown in ***Table 2*** are used in assigning a letter value to the resulting LOS for intersections.

TABLE 2 **Level of Service Criteria**[4]		
Level of Service (LOS)	**Two-Way or All-Way Stop Controlled Intersection Average Delay per Vehicle (sec)**	**Signalized Intersection Average Delay per Vehicle (sec)**
A	0-10	< or = 10
B	> 10 - 15	> 10 – 20
C	> 15 – 25	> 20 - 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80 or a V/C ratio equal or greater than 1.0

EXISTING LEVEL OF SERVICE AT INTERSECTIONS

Existing intersection level of service calculations are based upon AM and PM peak hour turning movement counts on a typical weekday. ***Table 3*** presents existing conditions during a typical weekday intersection level of service analysis summary.

Based on the results of this analysis, all of the study intersections are operating at acceptable LOS thresholds during peak hours.

HCM calculation worksheets for existing conditions are provided in the Technical Appendix.

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[4] Highway Capacity Manual, 2010 update, by the Transportation Research Board, Chapter 9, Signalized Intersections.

TABLE 3 Existing 2019 Conditions Level of Service				
Intersection	Peak Hour	Existing Conditions		
		LOS	Avg Delay (sec/veh)*	V/C
1. Arroyo Drive at Carillo Drive	AM	A	9.0	0.133
	PM	A	8.9	0.134
2. Mission Drive at Carillo Drive	AM	A	9.6	0.192
	PM	B	10.1	0.244
3. Arroyo Drive at Santa Anita St	AM	B	12.2	0.385
	PM	B	11.3	0.445

**Delay for the worst movement*

FUTURE (2021) CONDITIONS WITHOUT PROJECT

Ambient Growth Rate

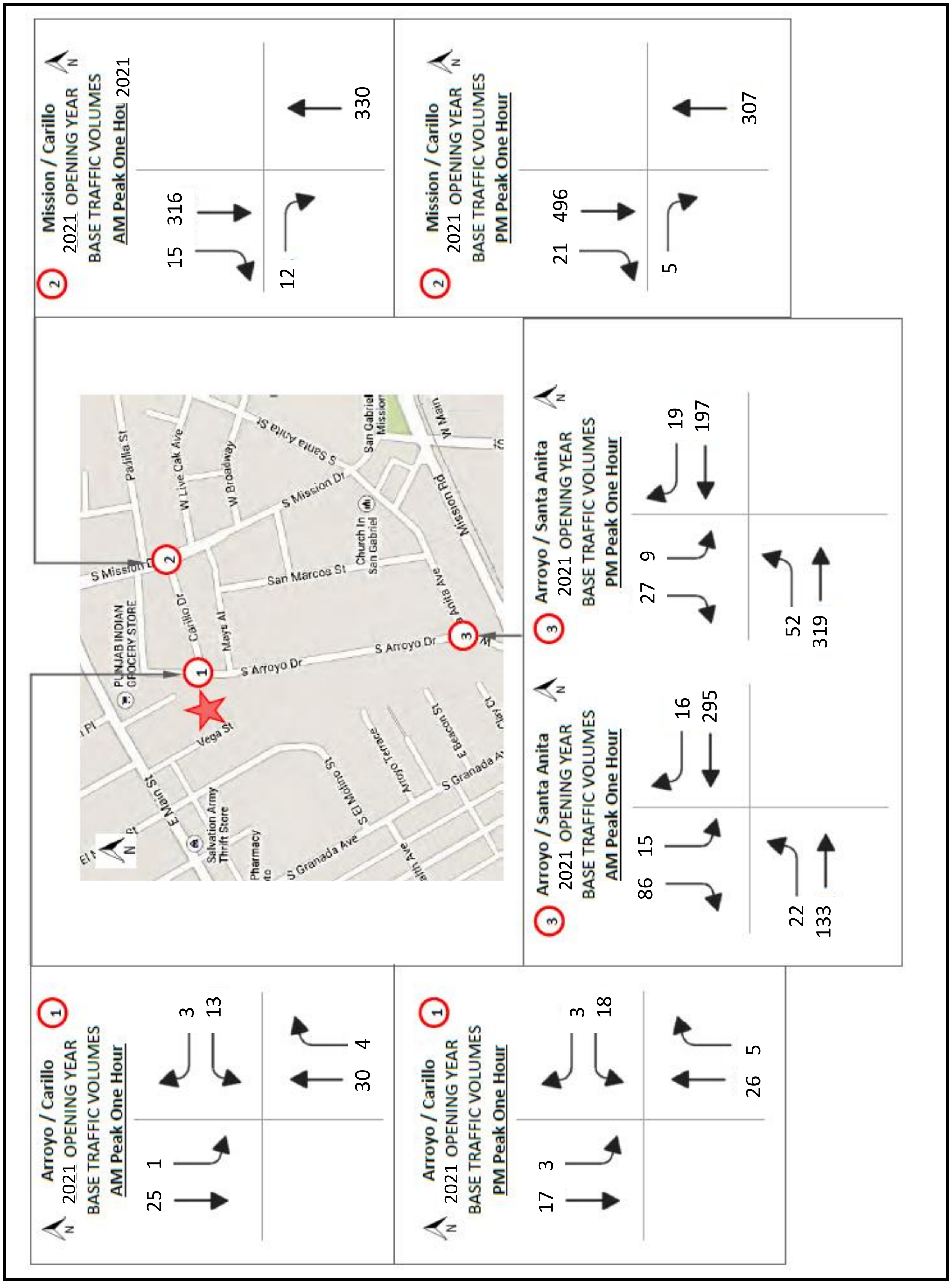
A one (1.0) percent per year annual growth rate was applied to existing volumes to create a 2021 base condition (i.e., the base volumes were multiplied by a factor of 1.02). The annual growth rate is intended to account for the typical increases in traffic volumes within the study area from any future development not accounted for in the list of related projects that may add traffic to the local area in addition to project traffic and specifically known projects. This is reflected in 2021 base traffic volumes. ***Table 4*** summarizes the level of service at the studied intersections for future base conditions.

TABLE 4 Summary of Opening Year 2021 Base Levels of Service Conditions				
Intersection	Peak Hour	Opening Year Base (Existing + Ambient Growth)		
		LOS	Avg Delay (sec/veh)*	V/C
1. Arroyo Drive at Carillo Drive	AM	A	9.0	0.133
	PM	A	8.9	0.134
2. Mission Drive at Carillo Drive	AM	A	9.6	0.194
	PM	B	10.1	0.247
3. Arroyo Drive at Santa Anita St	AM	B	12.3	0.387
	PM	B	11.4	0.451

**Delay for the worst movement*

Figure F provides Opening year base traffic volumes. As shown in table 4 the intersections will continue to operate at LOS A and B during peak hours.

Figure F: Future 2021 Base AM and PM Peak Hour Traffic at Key Intersections



Related Projects

The list cumulative development projects included in this analysis were obtained from by City of San Gabriel's Planning Division website. Cumulative development projects included in this analysis are assumed to contribute traffic to at least one or more of the study area intersections. A total of 7 (seven) projects were included in the cumulative traffic analysis. These are shown in ***Table 6***, along with estimated number of trips to be generated by them.

Trip Generation and Distribution of Related Projects

Table 5 presents the Institution of Transportation Engineers (ITE)'s trip generation rates from "Trip Generation" Manual, 10th edition (except for land use code 230, rates for which are available from 9th Edition). ***Table 6*** presents the trips generated by related projects. ***Figure G*** illustrates the location map of these cumulative developments. As seen in ***Table 6***, related projects are estimated to add 25,970 daily weekday trips with 956 during the AM peak hour and 2,522 trips during the PM peak hour. A portion of these trips were assumed to be using or traveling on roadways surrounding the project site. ***Figure H*** shows the estimated volume at each of the studied intersections due to these related projects.

TABLE 5
Trip Generation Rates for Related Projects

Project No.	ITE Land Use Code	Land Use	Unit	Weekday Trips	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
1	254	Assisted Living	Bed	2.60	0.19	78%	22%	0.26	30%	70%
2	720	Medical Office	1000 SF	34.80	2.78	78%	22%	3.46	28%	72%
3, 5, 6, 7	230* ITE 9th Ed)	Residential Condo	DU	5.81	0.44	17%	83%	0.52	67%	33%
3, 6	820	Commercial/ Shopping Ctr	1000 SF	37.75	0.94	62%	38%	3.81	48%	52%
5	231	Live/Work (Mid-rise Res w/ 1st fl Comm	DU	5.81	0.67	25%	75%	0.78	58%	42%
5, 7	814	Specialty Retail/Variety Store	1000 SF	63.43	3.18	57%	43%	6.84	52%	48%
5, 7	931	Quality Restaurant	1000 SF	112.22	10.00	55%	45%	9.78	61%	39%
6	310	Hotel	Room	8.36	0.47	59%	41%	0.60	51%	49%

TABLE 6
Related Project List and Trip Generation

No.	Project Name/Address	Status	Land Use	Size	Weekday Trips	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
1	Symphony at San Gabriel/ 824 S. Gladys Avenue	Mitigated Neg-Decl Approved	Assisted Living	235-bed	612	45	35	10	61	18	43
2	402 Las Tuna Drive	Plans Approved	Mixed-use Medical Office Condo	9,420-SF	328	26	20	6	32	9	23
3	Pacific Square/ 700-800 S. San Gabriel Bl	EIR Review	Residential Condo	243 DU	1,412	107	18	89	127	85	42
			Shopping Center	413,238 SF	15,600	389	241	142	1,575	756	819
			Total Trips Generated		**17,952**	**567**	**314**	**247**	**1,795**	**868**	**927**
4	220 S. San Gabriel Bl	No Info	-	-	-	-	-	-	-	-	-
5	416 E Las Tunas Dr	Completed	Residential Condo	15 DU	88	6	1	5	8	5	3
			Live/Work	18 DU	106	12	3	9	14	8	6
			Specialty Retail	3,100 SF	198	27	13	14	11	5	6
			Restaurant	6,200 SF	696	62	34	28	61	37	24
			Total Trips Generated		**1,088**	**107**	**51**	**56**	**94**	**55**	**39**
6	101-111 W Valley Blvd	Under Construction	Hotel	222-room	1,856	105	62	43	133	68	65
			Shopping Center	55,000 SF	2,076	52	33	20	210	101	109
			Residential Condo	87 DU	506	39	7	32	45	30	15
			Total Trips Generated		**4.438**	**197**	**102**	**95**	**388**	**199**	**189**
7	400-420 W Valley Blvd	Under Construction	Residential Condos	127	582	44	7	37	52	35	17
			Shopping Center	50,595 SF	1,910	47	29	18	193	93	100
			Total Trips Generated		**2,492**	**91**	**36**	**55**	**245**	**128**	**117**
Trips Generated by Related Projects					**25,970**	**956**	**503**	**453**	**2,522**	**1,250**	**1,272**

Source: City of San Gabriel Planning Division (Current Projects and Programs website)

Figure G: Related Project Locations

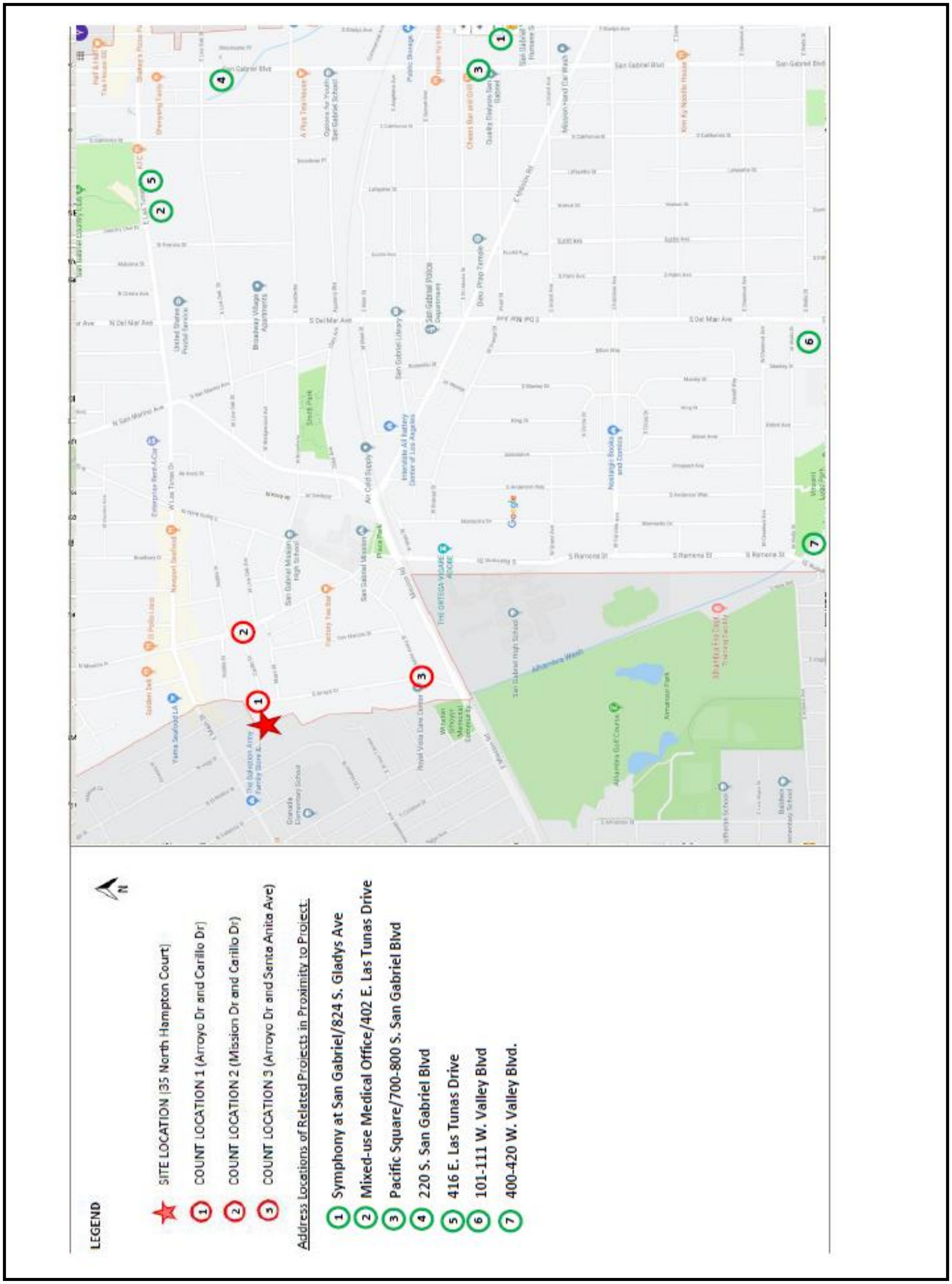
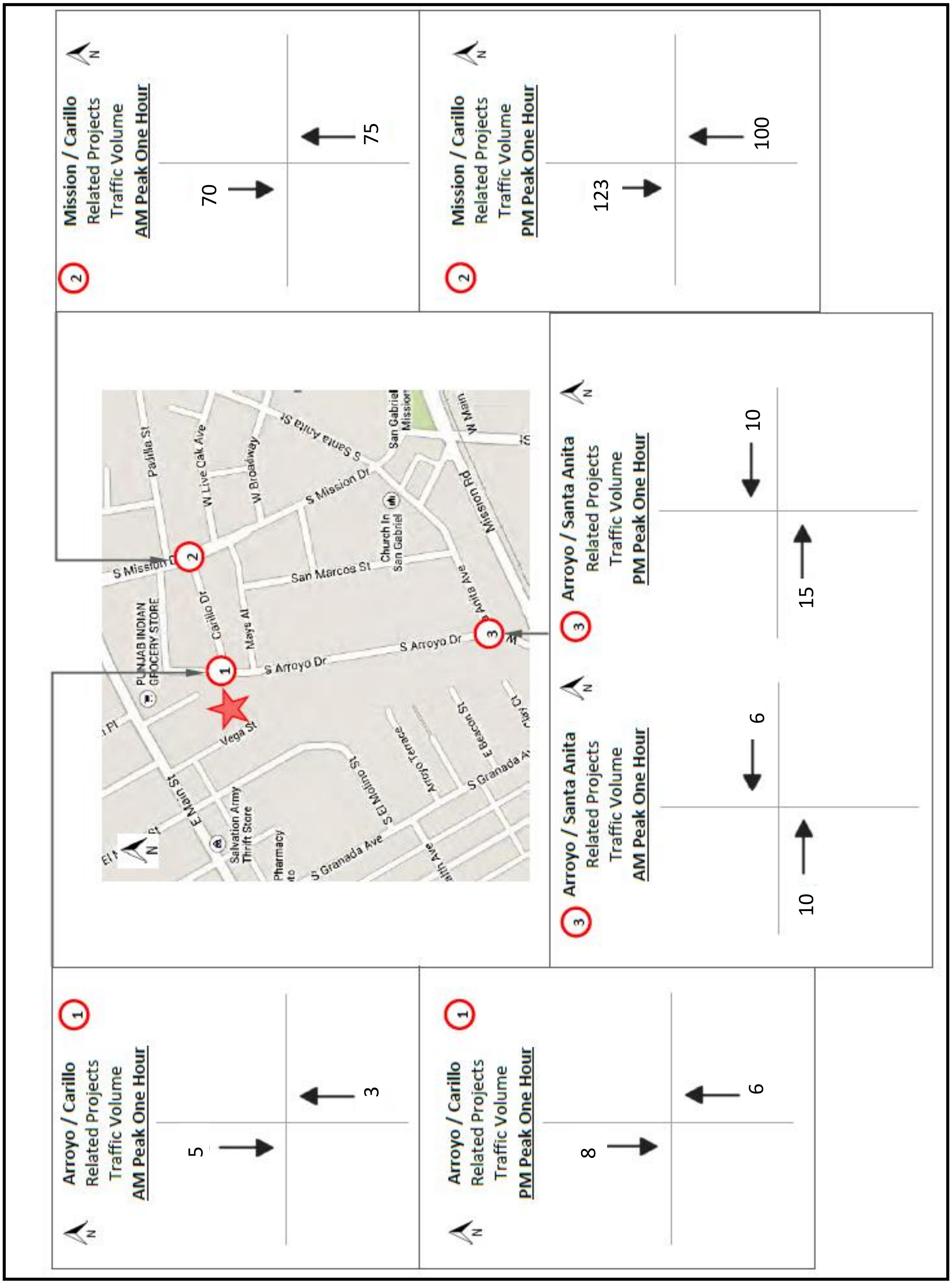


Figure H: Related Project AM and PM Peak Hour Traffic at Key Intersections



Future 2021 with Ambient Growth and Related Projects Level of Service Conditions

Table 7 presents a summary of intersection level of service analysis for future 2021 cumulative conditions without project for AM and PM weekday conditions. As the results indicate, all of the studied intersections will operate at acceptable LOS A and B. The level of service is based on peak hour volumes, geometric conditions and traffic from related projects. ***Figure I*** illustrate 2021 Volume plus Related Projects for AM and PM peak, respectively.

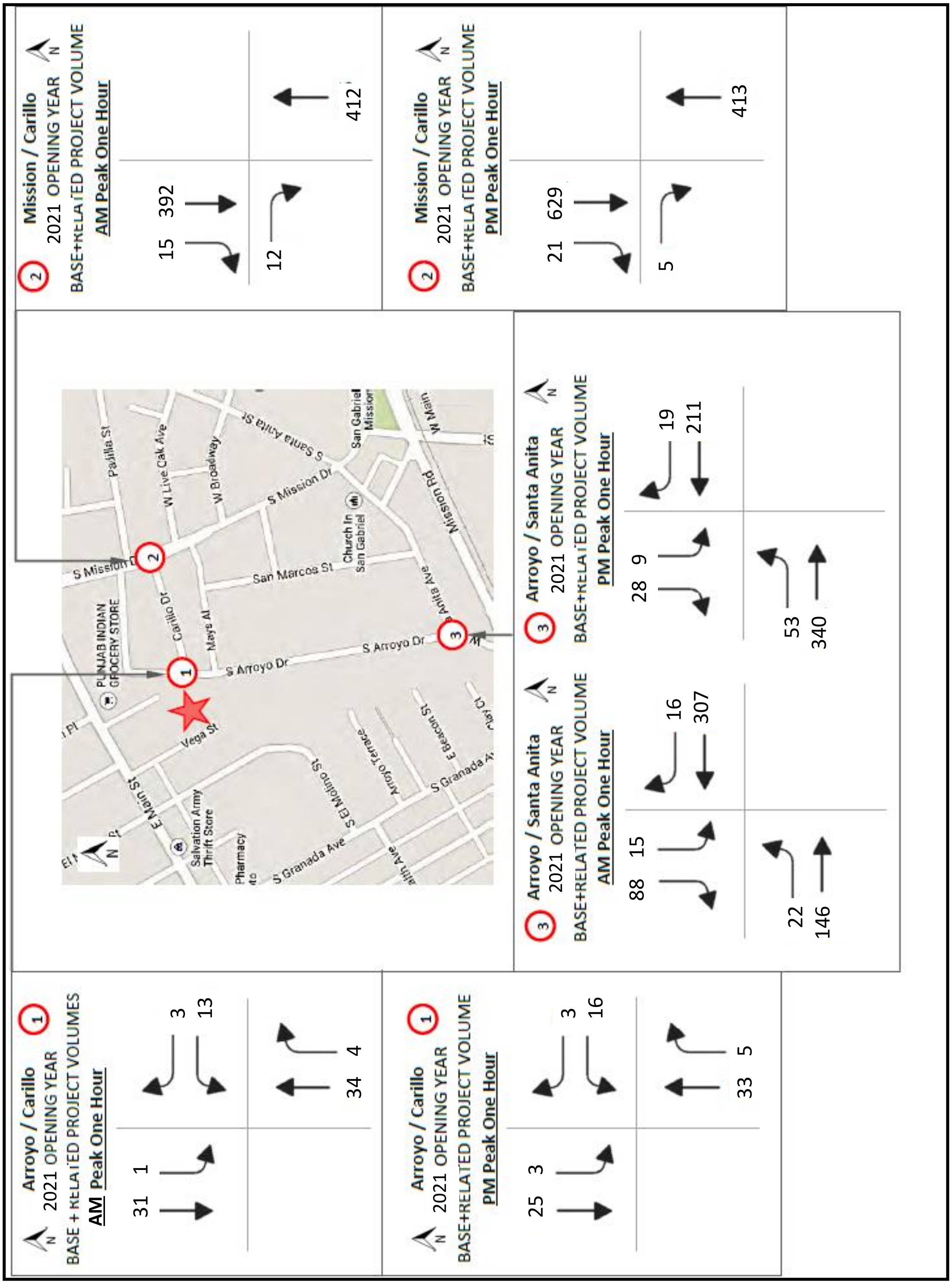
HCM level of service worksheets for future base conditions are provided in the Appendix.

TABLE 7
Opening Year 2021 plus Related Projects Level of Service Summary

Intersection	Peak Hour	Opening Year Base (Existing + Ambient Growth)			Opening Year With Related Projects		
		LOS	Avg Delay (sec/veh)*	V/C	LOS	Avg Delay (sec/veh)*	V/C
1. Arroyo Drive at Carillo Drive	AM	A	9.0	0.133	A	9.1	0.133
	PM	A	8.9	0.134	A	9.0	0.138
2. Mission Drive at Carillo Drive	AM	A	9.6	0.194	A	10.0	0.213
	PM	B	10.1	0.247	B	10.7	0.281
3. Arroyo Drive at Santa Anita Av	AM	B	12.3	0.387	B	12.4	0.392
	PM	B	11.4	0.451	B	11.5	0.464

**Delay for the worst movement*

Figure I: Future 2021 Base Plus Related Project AM and PM Traffic at Key Intersections



FUTURE (2021) CONDITIONS WITH PROJECT

Project Trip Generation

In order to accurately assess traffic conditions with the proposed project, trip generation estimates were developed for the project. Trip generation rates for the project are based on nationally recognized recommendations contained within the Institution of Transportation Engineers (ITE)'s publication, "Trip Generation" Manual, 9th edition. ITE's "Trip Generation" manual 10th Edition does not provide rates anymore for this specific Residential Condominium/Townhouses land use. The rates provided for ITE Land Use Code 230: Residential Condominiums/Townhouses in the 9th Edition are deemed appropriate for this project. As seen in ***Table 8***, during a typical weekday, the proposed project is expected to generate approximately 238 daily trips with 18 trips during the AM peak hour (3 entering and 15 exiting) and 21 trips during the PM peak hour (14 entering and 7 exiting).

TABLE 8
Trip Generation by Arroyo Village Condo Project

ITE Land Use Code	Size & Unit	Trip Generation Rate					Average Traffic Volume						
		Daily Total	AM Peak Hour		PM Peak Hour		Daily Total	AM Peak Hour			PM Peak Hour		
			Total	% I/O	Total	% I/O		Total	In	Out	Total	In	Out
230	41 DU	5.81	0.44	17/83	0.52	67/33	238	18	3	15	21	14	7

Project Trip Distribution

Arrival and departure distribution patterns for project-generated traffic were derived based on geographic location of the project to main arterials, location to major attractors and local roadway traffic patterns. Distribution patterns were then applied to the trip generation estimates to develop peak hour assignments of project-generated traffic to the circulation network within the study area. ***Figure J*** depicts the percentage of project trips through the study area. ***Figure K*** illustrates Project Only Traffic volumes during weekday AM and PM peaks, respectively. ***Figure L*** provides 2021 volumes with ambient growth, related projects and project traffic volumes for AM and PM peak hours, respectively.

Project Impacts

A project's traffic impact is determined by comparing the V/C ratio and LOS between the "with project" and "without project" conditions. The increase/decrease in V/C ratio at a given LOS is compared against a pre-selected threshold to determine whether the project generates a "significant impact" on the traffic conditions of a local circulation system.

LOS D is generally considered to be the lowest acceptable LOS in an urban or suburban area intersection. LOS E and F are considered to be unacceptable operating conditions.

Figure J: Regional Trip Distribution Percentages of Project Traffic

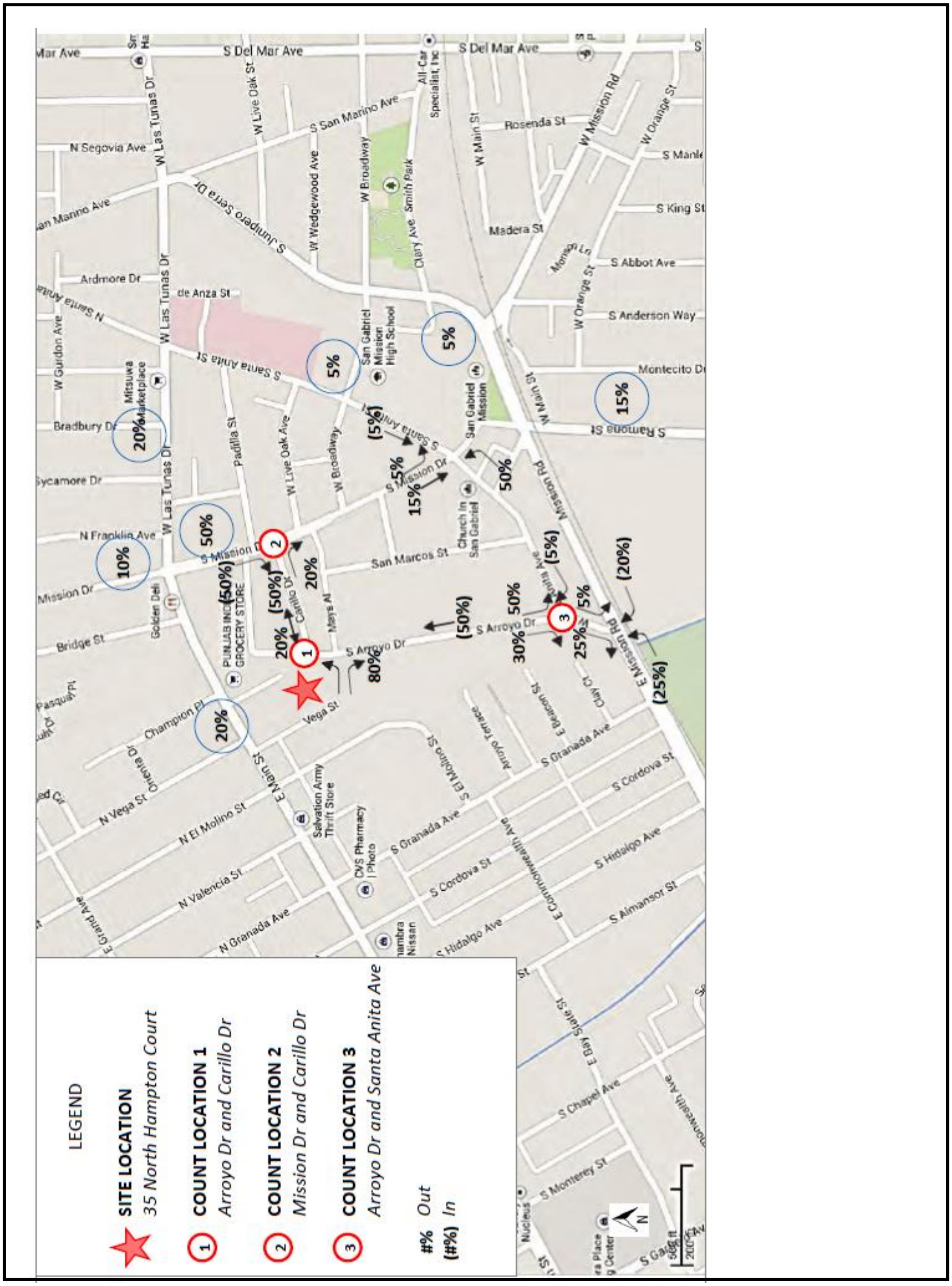


Figure K: Project AM and PM Peak Hour Traffic at Key Intersections

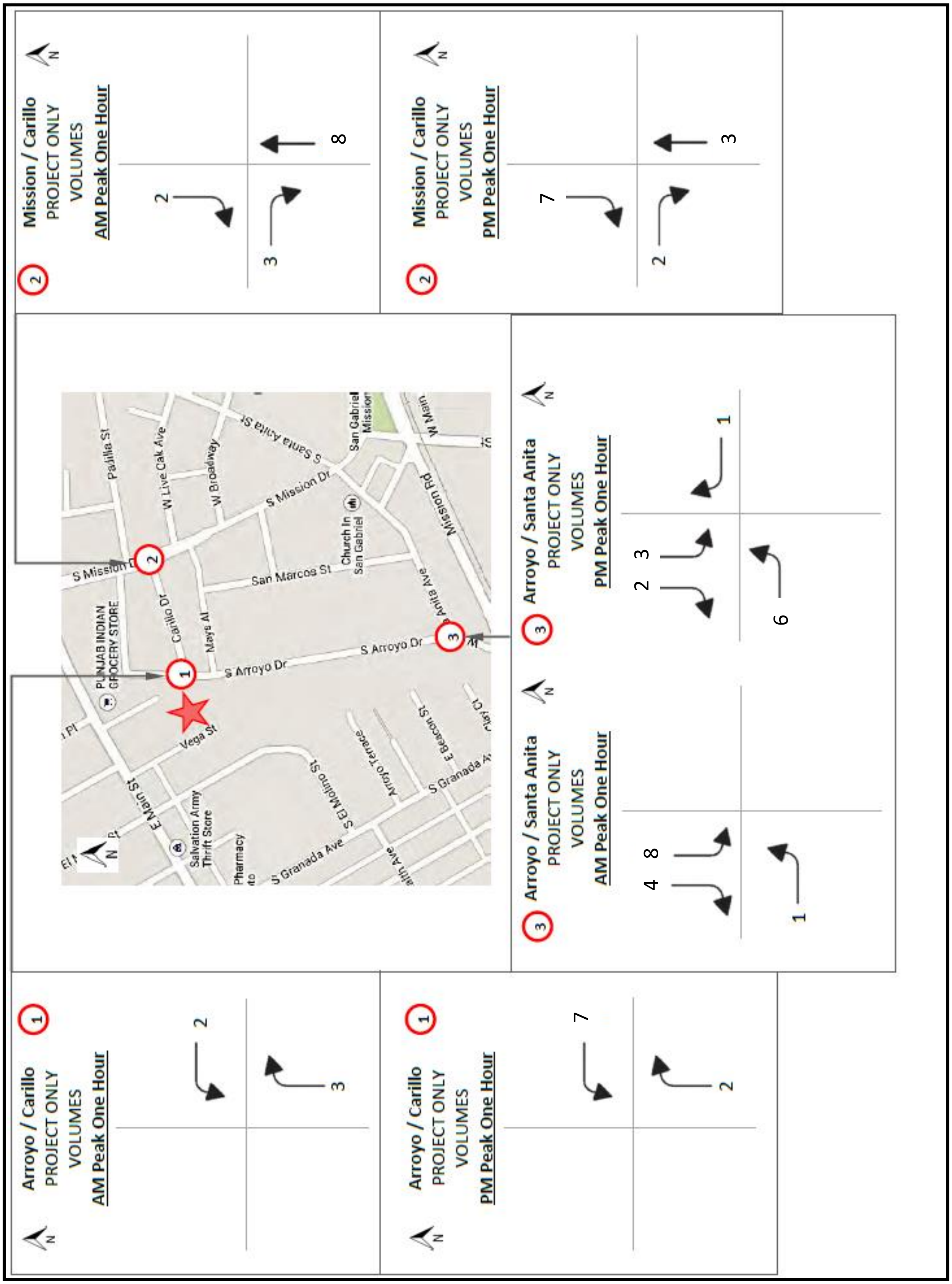
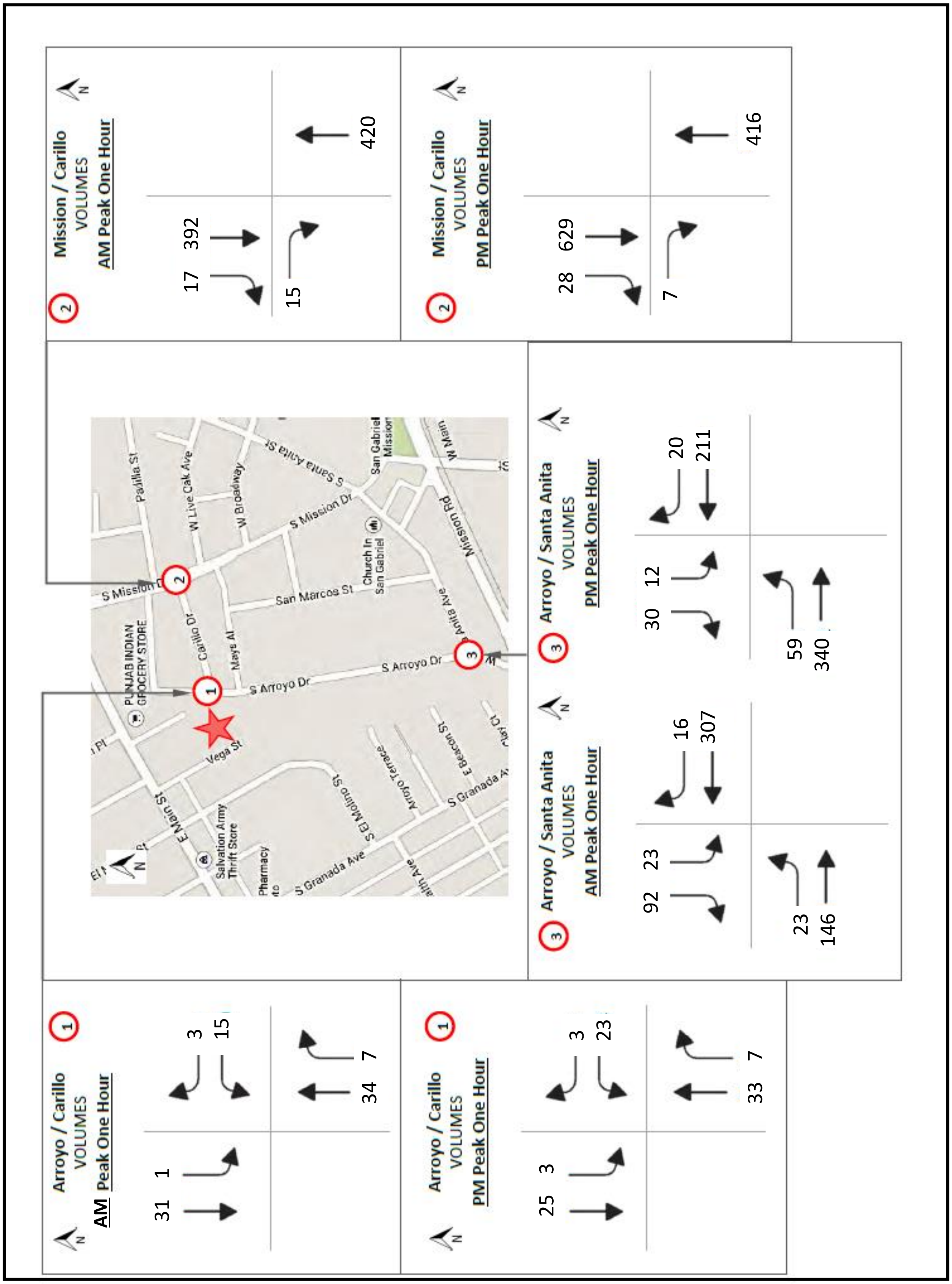


Figure L: Future 2021 Cumulative AM and PM Peak Hour Traffic at Key Intersections



In accordance with the City of San Gabriel's standard threshold criteria, a proposed project would normally have a "significant impact" on intersection capacity if the project traffic causes an increase in the V/C ratio at an intersection by an amount as listed in ***Table 9***:

TABLE 9
Levels of Significance

Level of Service	Volume/Capacity (V/C) Ratio	Project-related Increase in V/C
A,B	0.600-0.700	≥ 0.06
C	0.700-0.800	≥ 0.04
D	0.800-0.900	≥ 0.02
E,F	0.900 or greater	≥ 0.01

As indicated in ***Table 10***, the increase in V/C ratio by project's traffic would not exceed the above significance thresholds. The study intersections would continue to operate at acceptable LOS (i.e., at LOS D or better) after the completion of the project. Therefore, the project is not expected to have a significant traffic impact on the circulation system in the area.

TABLE 10
Opening Year 2021 Base Plus Related Plus Project Level of Service Summary

Intersection	Peak Hour	Opening Year With Related Projects			Opening Year With Related and Project Traffic		
		LOS	Avg Delay (sec/veh)*	V/C	LOS	Avg Delay (sec/veh)*	V/C
1. Arroyo Drive at Carillo Drive	AM	A	9.1	0.133	A	9.1	0.133
	PM	A	9.0	0.138	A	9.1	0.138
2. Mission Drive at Carillo Drive	AM	A	10.0	0.213	A	10.0	0.214
	PM	B	10.7	0.281	B	10.8	0.283
3. Arroyo Drive at Santa Anita St	AM	B	12.4	0.392	B	13.1	0.409
	PM	B	11.5	0.464	B	12.2	0.469

**Delay for the worst movement*

It should be noted that all 3 intersections analyzed are Stop-control and unsignalized. The significant impact threshold based on V/C is primarily applicable to signalized intersections. The V/C ratio for an unsignalized intersection may not accurately reflect the performance of the stop-control operation of traffic flow. Therefore, for unsignalized intersections, the following thresholds are generally accepted throughout the region and has been utilized in other studies within the City of San Gabriel:

"A significant impact is defined to occur at an unsignalized study intersection if the proposed project is forecast to result I one or more of the following criteria:

- Causes or worsens unacceptable Level of Service E or F; and
- A traffic signal is warranted based on the California Manual on Uniform Traffic Control

Devices (CA-MUTCD) peak hour volume warrant.”

Based on the LOS B or better performance of all 3 intersections under future conditions with project (as shown in Table 10), the project will not have significant impacts at any of the 3 unsignalized intersections.

All figures and level of service summary sheets are included in the Technical Appendix.

Project Access Road

The project’s access road (a bridge over Alhambra Wash) will connect to Arroyo Drive at its intersection with Mays Alley. The access road must be adequately designed to provide the basic clear width and vertical clearance requirements for Fire truck access. The access road, as designed, is wider than the twenty feet clear width requirements and provides a minimum of thirteen feet six inches of vertical clearance. Fire lanes should be indicated with appropriate signage, pavement markings and curb painting to maintain access. Turn radius for fire trucks should be approved by the City’s Fire department.

CONCLUSION

Based on the results of this traffic analysis, the Arroyo Village Condo project is not expected to have a significant impact on the area’s circulation system during the AM and PM peak hours of an average weekday. Therefore, off-site traffic impact mitigation measures are not deemed necessary for development of the project.

The analysis indicates that all of the studied intersections currently operate at an acceptable level of service (i.e., at LOS D or better) during both the AM and PM peak hours of an average weekday. These intersections will continue to operate at acceptable conditions with the addition of traffic to be generated from the project and 7 other projects within the area. Traffic from the project is not expected to significantly impact any of the intersections analyzed.

The project’s access road (a bridge over Alhambra Wash) will connect to Arroyo Drive at its intersection with Mays Alley. The access road must be adequately designed to provide the basic clear width and vertical clearance requirements for Fire truck access. The access road, as designed, is wider than the twenty feet clear width requirements and provides a minimum of thirteen feet six inches of vertical clearance. Fire lanes should be indicated with appropriate signage, pavement markings and curb painting to maintain access. Turn radius for fire trucks should be approved by the City’s Fire department.

Technical Appendix

Appendix 1:
Existing 2019 Traffic Counts of Turning Movements

CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : Arroyo_Carillo
Site Code : 00000000
Start Date : 5/15/2019
Page No : 1

Groups Printed- Vehicles

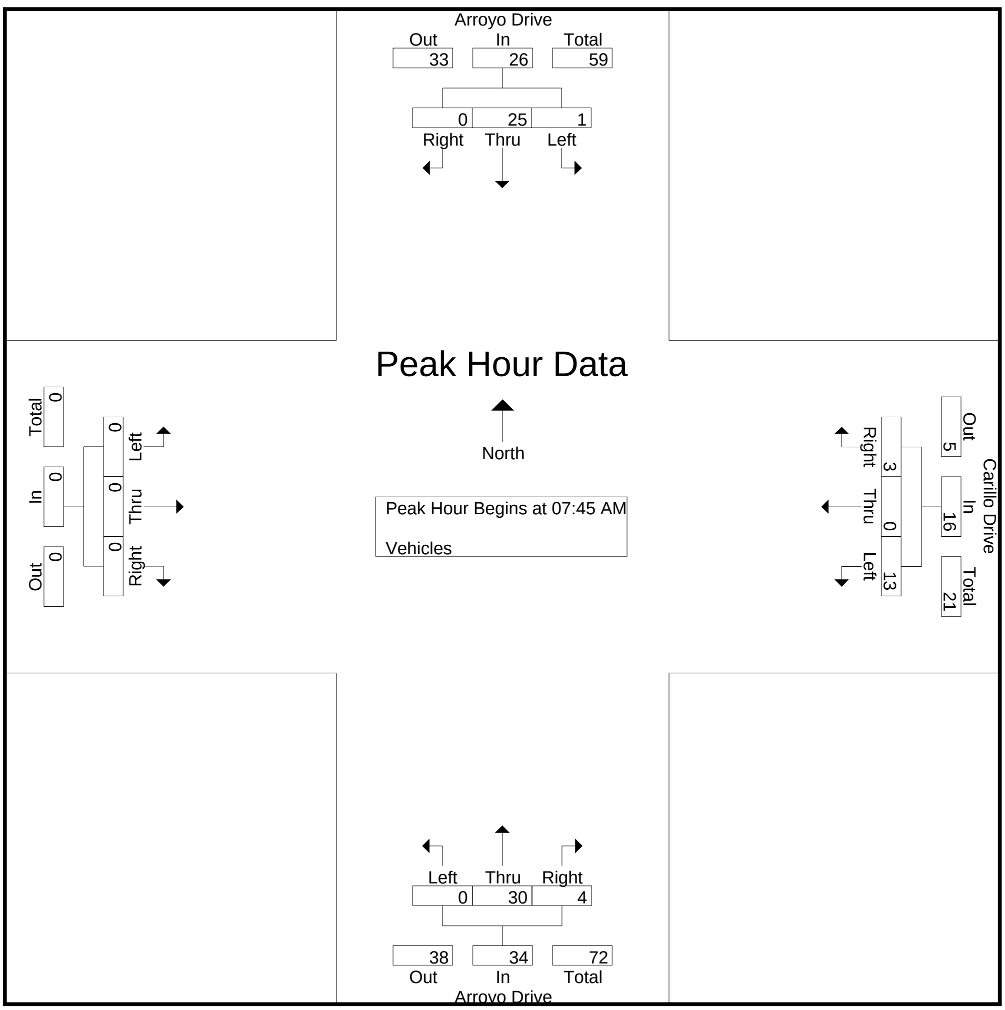
	Arroyo Drive Southbound			**Carillo Drive Westbound**			**Arroyo Drive Northbound**			**Eastbound**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	5	0	4	0	1	0	5	0	0	0	0	15
07:15 AM	0	2	0	4	0	4	0	6	1	0	0	0	17
07:30 AM	1	4	0	4	0	2	0	2	0	0	0	0	13
07:45 AM	0	9	0	2	0	0	0	7	0	0	0	0	18
Total	1	20	0	14	0	7	0	20	1	0	0	0	63
08:00 AM	0	4	0	3	0	1	0	9	2	0	0	0	19
08:15 AM	1	8	0	6	0	1	0	7	1	0	0	0	24
08:30 AM	0	4	0	2	0	1	0	7	1	0	0	0	15
08:45 AM	1	5	0	1	0	1	0	5	0	0	0	0	13
Total	2	21	0	12	0	4	0	28	4	0	0	0	71
04:00 PM	0	4	0	1	0	1	0	4	0	0	0	0	10
04:15 PM	1	6	0	5	0	0	0	4	1	0	0	0	17
04:30 PM	1	1	0	4	0	0	0	5	1	0	0	0	12
04:45 PM	0	5	0	3	0	2	0	7	2	0	0	0	19
Total	2	16	0	13	0	3	0	20	4	0	0	0	58
05:00 PM	1	5	0	4	0	1	0	10	1	0	0	0	22
05:15 PM	0	2	0	2	0	0	0	6	1	0	0	0	11
05:30 PM	0	10	0	1	0	0	0	4	2	0	0	0	17
05:45 PM	0	7	0	4	0	1	0	5	3	0	0	0	20
Total	1	24	0	11	0	2	0	25	7	0	0	0	70
Grand Total	6	81	0	50	0	16	0	93	16	0	0	0	262
Apprch %	6.9	93.1	0	75.8	0	24.2	0	85.3	14.7	0	0	0	
Total %	2.3	30.9	0	19.1	0	6.1	0	35.5	6.1	0	0	0	

CITY TRAFFIC COUNTERS

WWW.CTCOUNTERS.COM

File Name : Arroyo_Carillo
Site Code : 00000000
Start Date : 5/15/2019
Page No : 2

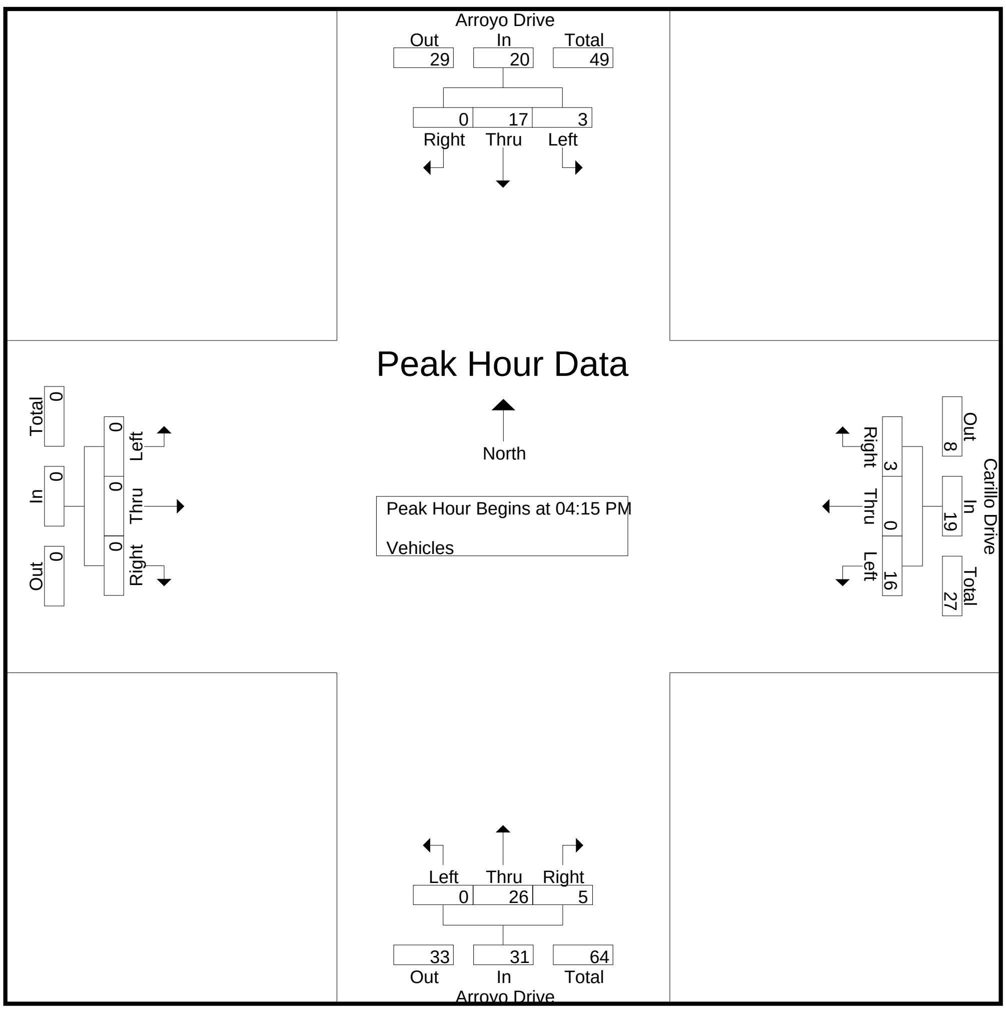
	Arroyo Drive Southbound				Carillo Drive Westbound				Arroyo Drive Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	**9**	0	**9**	2	0	0	2	0	7	0	7	0	0	0	0	18
08:00 AM	0	4	0	4	3	0	**1**	4	0	**9**	**2**	**11**	0	0	0	0	19
08:15 AM	**1**	8	0	9	**6**	0	1	**7**	0	7	1	8	0	0	0	0	**24**
08:30 AM	0	4	0	4	2	0	1	3	0	7	1	8	0	0	0	0	15
Total Volume	1	25	0	26	13	0	3	16	0	30	4	34	0	0	0	0	76
% App. Total	3.8	96.2	0		81.2	0	18.8		0	88.2	11.8		0	0	0		
PHF	.250	.694	.000	.722	.542	.000	.750	.571	.000	.833	.500	.773	.000	.000	.000	.000	.792



CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : Arroyo_Carillo
Site Code : 00000000
Start Date : 5/15/2019
Page No : 3

	Arroyo Drive Southbound				Carillo Drive Westbound				Arroyo Drive Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**1**	**6**	0	**7**	**5**	0	0	**5**	0	4	1	5	0	0	0	0	17
04:30 PM	1	1	0	2	4	0	0	4	0	5	1	6	0	0	0	0	12
04:45 PM	0	5	0	5	3	0	**2**	5	0	7	**2**	9	0	0	0	0	19
05:00 PM	1	5	0	6	4	0	1	5	0	**10**	1	**11**	0	0	0	0	**22**
Total Volume	3	17	0	20	16	0	3	19	0	26	5	31	0	0	0	0	70
% App. Total	15	85	0		84.2	0	15.8		0	83.9	16.1		0	0	0		
PHF	.750	.708	.000	.714	.800	.000	.375	.950	.000	.650	.625	.705	.000	.000	.000	.000	.795



CITY TRAFFIC COUNTERS
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Groups Printed- Vehicles

	Mission Drive Southbound			Westbound			Mission Drive Northbound			Carillo Drive Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	32	2	0	0	0	0	46	0	0	0	2	82
07:15 AM	0	53	2	0	0	0	0	43	0	0	0	0	98
07:30 AM	0	62	6	0	0	0	0	57	0	0	0	3	128
07:45 AM	0	98	2	0	0	0	0	87	0	0	0	0	187
Total	0	245	12	0	0	0	0	233	0	0	0	5	495
08:00 AM	0	90	5	0	0	0	0	103	0	0	0	5	203
08:15 AM	0	66	2	0	0	0	0	83	0	0	0	4	155
08:30 AM	0	52	6	0	0	0	0	61	0	0	0	3	122
08:45 AM	0	62	2	0	0	0	0	69	0	0	0	4	137
Total	0	270	15	0	0	0	0	316	0	0	0	16	617
04:00 PM	0	82	2	0	0	0	0	58	0	0	0	1	143
04:15 PM	0	67	5	0	0	0	0	54	0	0	0	1	127
04:30 PM	0	77	4	0	0	0	0	46	0	0	0	1	128
04:45 PM	0	94	8	0	0	0	0	76	0	0	0	2	180
Total	0	320	19	0	0	0	0	234	0	0	0	5	578
05:00 PM	0	115	7	0	0	0	0	63	0	0	0	0	185
05:15 PM	0	132	3	0	0	0	0	77	0	0	0	2	214
05:30 PM	0	118	3	0	0	0	0	83	0	0	0	3	207
05:45 PM	0	131	8	0	0	0	0	84	0	0	0	0	223
Total	0	496	21	0	0	0	0	307	0	0	0	5	829
Grand Total	0	1331	67	0	0	0	0	1090	0	0	0	31	2519
Apprch %	0	95.2	4.8	0	0	0	0	100	0	0	0	100	
Total %	0	52.8	2.7	0	0	0	0	43.3	0	0	0	1.2	

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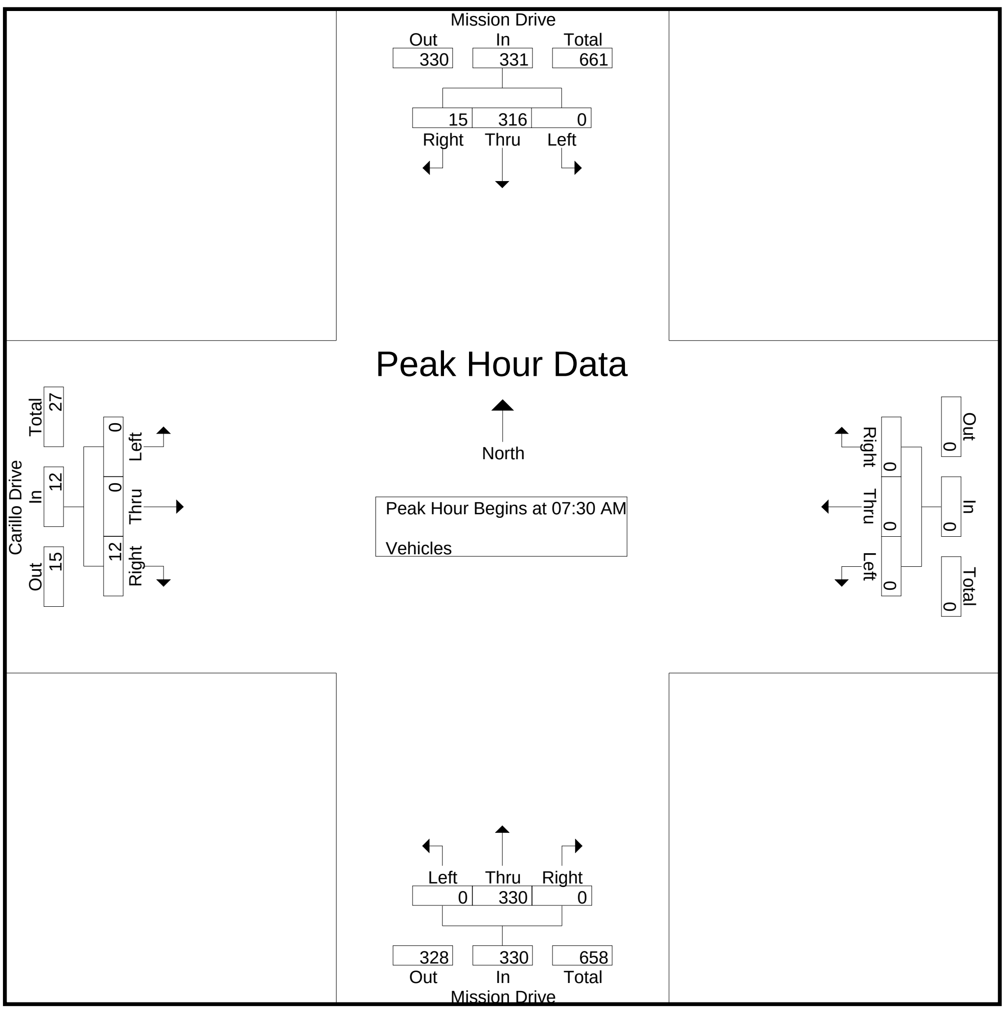
	Mission Drive Southbound				Westbound				Mission Drive Northbound				Carillo Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	62	**6**	68	0	0	0	0	0	57	0	57	0	0	3	3	128
07:45 AM	0	**98**	2	**100**	0	0	0	0	0	87	0	87	0	0	0	0	187
08:00 AM	0	90	5	95	0	0	0	0	0	**103**	0	**103**	0	0	**5**	**5**	**203**
08:15 AM	0	66	2	68	0	0	0	0	0	83	0	83	0	0	4	4	155
Total Volume	0	316	15	331	0	0	0	0	0	330	0	330	0	0	12	12	673
% App. Total	0	95.5	4.5		0	0	0		0	100	0		0	0	100		
PHF	.000	.806	.625	.828	.000	.000	.000	.000	.000	.801	.000	.801	.000	.000	.600	.600	.829



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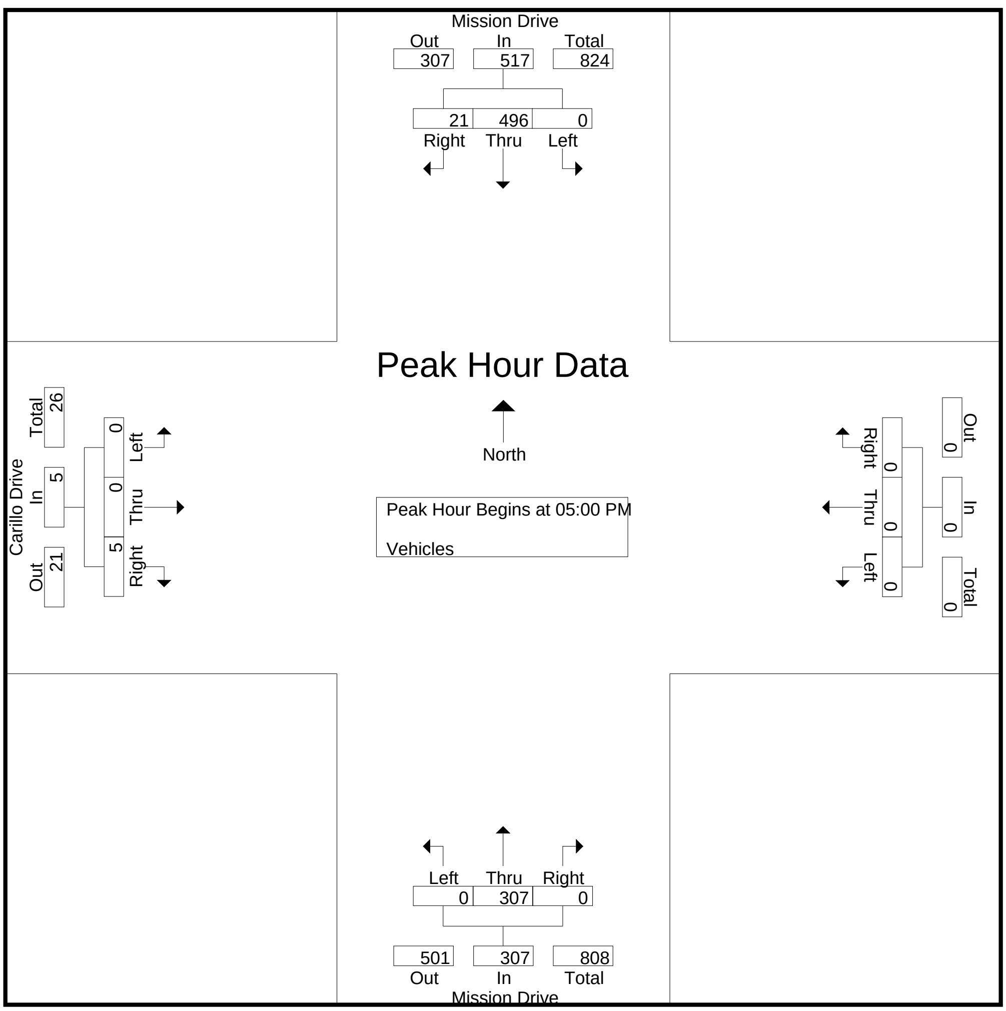
	Mission Drive Southbound				**Westbound**				**Mission Drive Northbound**				**Carillo Drive Eastbound**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	115	7	122	0	0	0	0	0	63	0	63	0	0	0	0	185
05:15 PM	0	**132**	3	135	0	0	0	0	0	77	0	77	0	0	2	2	214
05:30 PM	0	118	3	121	0	0	0	0	0	83	0	83	0	0	**3**	**3**	207
05:45 PM	0	131	**8**	**139**	0	0	0	0	0	**84**	0	**84**	0	0	0	0	**223**
Total Volume	0	496	21	517	0	0	0	0	0	307	0	307	0	0	5	5	829
% App. Total	0	95.9	4.1		0	0	0		0	100	0		0	0	100		
PHF	.000	.939	.656	.930	.000	.000	.000	.000	.000	.914	.000	.914	.000	.000	.417	.417	.929



CITY TRAFFIC COUNTERS
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File Name : Arroyo_SantaAnita
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Groups Printed- Vehicles

	Arroyo Drive Southbound			**Santa Anita St Westbound**			**Northbound**			**Santa Anita St Eastbound**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	0	18	0	57	2	0	0	0	3	21	0	103
07:15 AM	4	0	17	0	50	2	0	0	0	3	24	0	100
07:30 AM	4	0	29	0	70	3	0	0	0	2	35	0	143
07:45 AM	6	0	27	0	72	6	0	0	0	2	37	0	150
Total	16	0	91	0	249	13	0	0	0	10	117	0	496
08:00 AM	1	0	13	0	83	6	0	0	0	11	32	0	146
08:15 AM	4	0	17	0	70	1	0	0	0	7	29	0	128
08:30 AM	1	0	15	0	80	3	0	0	0	1	21	0	121
08:45 AM	2	0	12	0	71	3	0	0	0	3	24	0	115
Total	8	0	57	0	304	13	0	0	0	22	106	0	510
04:00 PM	2	0	3	0	39	7	0	0	0	7	41	0	99
04:15 PM	3	0	3	0	33	5	0	0	0	14	39	0	97
04:30 PM	2	0	7	0	36	7	0	0	0	6	47	0	105
04:45 PM	4	0	10	0	34	7	0	0	0	9	38	0	102
Total	11	0	23	0	142	26	0	0	0	36	165	0	403
05:00 PM	2	0	7	0	55	3	0	0	0	13	72	0	152
05:15 PM	3	0	9	0	45	4	0	0	0	12	81	0	154
05:30 PM	2	0	7	0	57	9	0	0	0	10	80	0	165
05:45 PM	2	0	4	0	40	3	0	0	0	17	86	0	152
Total	9	0	27	0	197	19	0	0	0	52	319	0	623
Grand Total	44	0	198	0	892	71	0	0	0	120	707	0	2032
Apprch %	18.2	0	81.8	0	92.6	7.4	0	0	0	14.5	85.5	0	
Total %	2.2	0	9.7	0	43.9	3.5	0	0	0	5.9	34.8	0	

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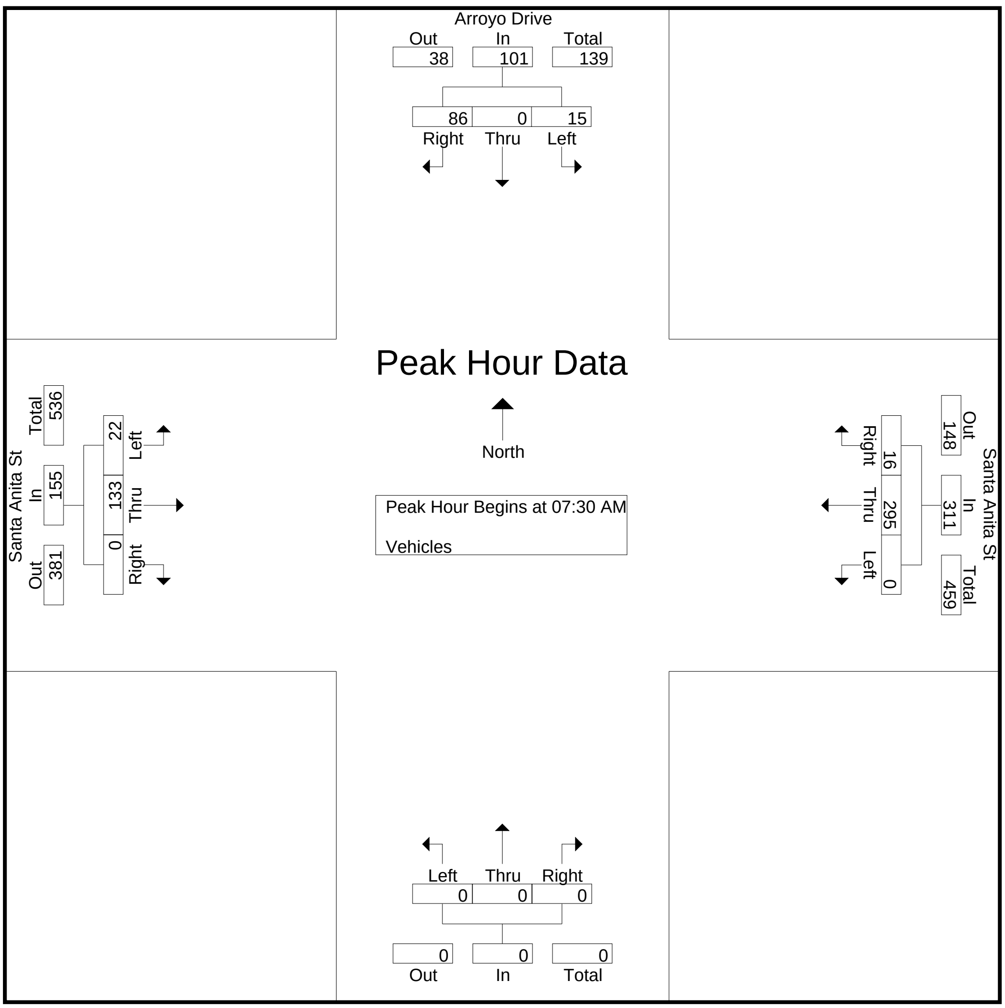
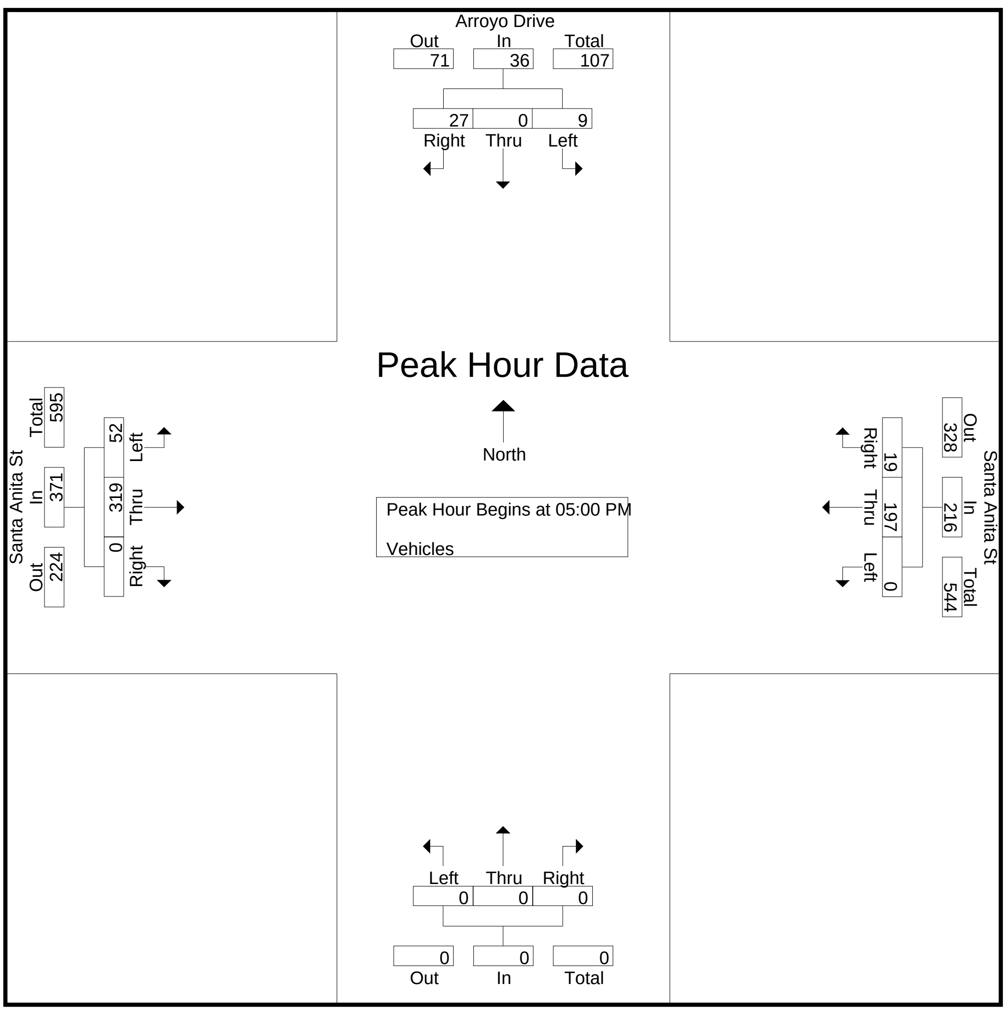
	Arroyo Drive Southbound				**Santa Anita St Westbound**				**Northbound**				**Santa Anita St Eastbound**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	4	0	**29**	**33**	0	70	3	73	0	0	0	0	2	35	0	37	143
07:45 AM	**6**	0	27	33	0	72	**6**	78	0	0	0	0	2	**37**	0	39	**150**
08:00 AM	1	0	13	14	0	**83**	6	**89**	0	0	0	0	**11**	32	0	**43**	146
08:15 AM	4	0	17	21	0	70	1	71	0	0	0	0	7	29	0	36	128
Total Volume	15	0	86	101	0	295	16	311	0	0	0	0	22	133	0	155	567
% App. Total	14.9	0	85.1		0	94.9	5.1		0	0	0		14.2	85.8	0		
PHF	.625	.000	.741	.765	.000	.889	.667	.874	.000	.000	.000	.000	.500	.899	.000	.901	.945



File Name : Arroyo_SantaAnita
Site Code : 00000000
Start Date : 5/15/2019

	Arroyo Drive Southbound				**Santa Anita St Westbound**				**Northbound**				**Santa Anita St Eastbound**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	0	7	9	0	55	3	58	0	0	0	0	13	72	0	85	152
05:15 PM	**3**	0	**9**	**12**	0	45	4	49	0	0	0	0	12	81	0	93	154
05:30 PM	2	0	7	9	0	**57**	**9**	**66**	0	0	0	0	10	80	0	90	**165**
05:45 PM	2	0	4	6	0	40	3	43	0	0	0	0	**17**	**86**	0	**103**	152
Total Volume	9	0	27	36	0	197	19	216	0	0	0	0	52	319	0	371	623
% App. Total	25	0	75		0	91.2	8.8		0	0	0		14	86	0		
PHF	.750	.000	.750	.750	.000	.864	.528	.818	.000	.000	.000	.000	.765	.927	.000	.900	.944



Appendix 2:
LOS Analysis for 2019 Existing AM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	13	3	30	4	1	25
Peak Hour Factor	0.54	0.75	0.83	0.77	0.25	0.69
Hourly flow rate (vph)	24	4	36	5	4	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	83	39			41	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83	39			41	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	916	1033			1568	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	41	40
Volume Left	24	0	4
Volume Right	4	5	0
cSH	931	1700	1568
Volume to Capacity	0.03	0.02	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	9.0	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	12	0	330	316	15
Peak Hour Factor	1.00	0.60	1.00	0.80	0.81	0.63
Hourly flow rate (vph)	0	20	0	412	390	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	608	207	414			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	608	207	414			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	427	799	1141			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	206	206	260	154
Volume Left	0	0	0	0	0
Volume Right	20	0	0	0	24
cSH	799	1700	1700	1700	1700
Volume to Capacity	0.03	0.12	0.12	0.15	0.09
Queue Length (ft)	2	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.6	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	133	295	16	15	86
Peak Hour Factor	0.50	0.90	0.89	0.67	0.63	0.74
Hourly flow rate (vph)	44	148	331	24	24	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355				579	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				579	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				95	83
cM capacity (veh/h)	1203				460	699

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	192	355	140
Volume Left	44	0	24
Volume Right	0	24	116
cSH	1203	1700	642
Volume to Capacity	0.04	0.21	0.22
Queue Length (ft)	3	0	21
Control Delay (s)	2.1	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	2.1	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 3:
LOS Analysis for 2019 Existing PM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	16	3	26	5	3	17
Peak Hour Factor	0.80	0.30	0.65	0.63	0.75	0.71
Hourly flow rate (vph)	20	10	40	8	4	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	76	44			48	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76	44			48	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	925	1026			1559	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	48	28
Volume Left	20	0	4
Volume Right	10	8	0
cSH	956	1700	1559
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	8.9	0.0	1.1
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	1.1
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	5	0	307	496	21
Peak Hour Factor	1.00	0.42	1.00	0.91	0.94	0.66
Hourly flow rate (vph)	0	12	0	337	528	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	712	280	559			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	280	559			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	367	717	1008			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	169	169	352	208
Volume Left	0	0	0	0	0
Volume Right	12	0	0	0	32
cSH	717	1700	1700	1700	1700
Volume to Capacity	0.02	0.10	0.10	0.21	0.12
Queue Length (ft)	1	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	52	319	197	19	9	27
Peak Hour Factor	0.77	0.93	0.86	0.53	0.75	0.75
Hourly flow rate (vph)	68	343	229	36	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	265				725	247
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265				725	247
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	95
cM capacity (veh/h)	1299				372	792

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	411	265	48
Volume Left	68	0	12
Volume Right	0	36	36
cSH	1299	1700	617
Volume to Capacity	0.05	0.16	0.08
Queue Length (ft)	4	0	6
Control Delay (s)	1.7	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 4:
LOS Analysis for 2021 Base AM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	13	3	31	4	1	26
Peak Hour Factor	0.54	0.75	0.83	0.77	0.25	0.69
Hourly flow rate (vph)	24	4	37	5	4	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	86	40			43	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	86	40			43	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	913	1031			1566	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	43	42
Volume Left	24	0	4
Volume Right	4	5	0
cSH	928	1700	1566
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	9.0	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	12	0	337	322	15
Peak Hour Factor	1.00	0.60	1.00	0.80	0.81	0.63
Hourly flow rate (vph)	0	20	0	421	398	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	620	211	421			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620	211	421			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	420	795	1134			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	211	211	265	156
Volume Left	0	0	0	0	0
Volume Right	20	0	0	0	24
cSH	795	1700	1700	1700	1700
Volume to Capacity	0.03	0.12	0.12	0.16	0.09
Queue Length (ft)	2	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.6	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	136	301	16	15	88
Peak Hour Factor	0.50	0.90	0.89	0.67	0.63	0.74
Hourly flow rate (vph)	44	151	338	24	24	119
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	362				589	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	362				589	350
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				95	83
cM capacity (veh/h)	1197				453	693

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	195	362	143
Volume Left	44	0	24
Volume Right	0	24	119
cSH	1197	1700	637
Volume to Capacity	0.04	0.21	0.22
Queue Length (ft)	3	0	21
Control Delay (s)	2.1	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	2.1	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 5:
LOS Analysis for 2021 Base PM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	16	3	27	5	3	17
Peak Hour Factor	0.80	0.38	0.65	0.63	0.75	0.71
Hourly flow rate (vph)	20	8	42	8	4	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	77	46			49	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77	46			49	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	923	1024			1557	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	49	28
Volume Left	20	0	4
Volume Right	8	8	0
cSH	950	1700	1557
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	8.9	0.0	1.1
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	1.1
Approach LOS	A		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	13.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	5	0	313	506	21
Peak Hour Factor	1.00	0.42	1.00	0.91	0.94	0.66
Hourly flow rate (vph)	0	12	0	344	538	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	726	285	570			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	285	570			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	359	712	998			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	172	172	359	211
Volume Left	0	0	0	0	0
Volume Right	12	0	0	0	32
cSH	712	1700	1700	1700	1700
Volume to Capacity	0.02	0.10	0.10	0.21	0.12
Queue Length (ft)	1	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	53	325	201	19	9	28
Peak Hour Factor	0.77	0.93	0.86	0.53	0.75	0.75
Hourly flow rate (vph)	69	349	234	36	12	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	270				739	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	270				739	252
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	95
cM capacity (veh/h)	1294				364	787

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	270	49
Volume Left	69	0	12
Volume Right	0	36	37
cSH	1294	1700	614
Volume to Capacity	0.05	0.16	0.08
Queue Length (ft)	4	0	7
Control Delay (s)	1.8	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	1.8	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 6:
LOS Analysis for 2021 Base Plus Related Projects AM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	13	3	34	4	1	31
Peak Hour Factor	0.54	0.75	0.83	0.77	0.25	0.69
Hourly flow rate (vph)	24	4	41	5	4	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	96	44			46	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	44			46	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	900	1027			1562	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	46	49
Volume Left	24	0	4
Volume Right	4	5	0
cSH	917	1700	1562
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	9.1	0.0	0.6
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.6
Approach LOS	A		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	12	0	412	392	15
Peak Hour Factor	1.00	0.60	1.00	0.80	0.81	0.63
Hourly flow rate (vph)	0	20	0	515	484	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	753	254	508			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	753	254	508			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	345	746	1053			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	258	258	323	185
Volume Left	0	0	0	0	0
Volume Right	20	0	0	0	24
cSH	746	1700	1700	1700	1700
Volume to Capacity	0.03	0.15	0.15	0.19	0.11
Queue Length (ft)	2	0	0	0	0
Control Delay (s)	10.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	10.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	146	307	16	15	88
Peak Hour Factor	0.50	0.90	0.89	0.67	0.63	0.74
Hourly flow rate (vph)	44	162	345	24	24	119
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	369				607	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	369				607	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				95	83
cM capacity (veh/h)	1190				443	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	206	369	143
Volume Left	44	0	24
Volume Right	0	24	119
cSH	1190	1700	629
Volume to Capacity	0.04	0.22	0.23
Queue Length (ft)	3	0	22
Control Delay (s)	2.0	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	2.0	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 7:
LOS Analysis for 2021 Base Plus Related Projects PM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	16	3	33	5	3	25
Peak Hour Factor	0.80	0.38	0.65	0.63	0.75	0.71
Hourly flow rate (vph)	20	8	51	8	4	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98	55			59	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	55			59	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	899	1012			1545	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	59	39
Volume Left	20	0	4
Volume Right	8	8	0
cSH	928	1700	1545
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	9.0	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	5	0	413	629	21
Peak Hour Factor	1.00	0.42	1.00	0.91	0.94	0.66
Hourly flow rate (vph)	0	12	0	454	669	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	912	350	701			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	912	350	701			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	273	646	892			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	227	227	446	255
Volume Left	0	0	0	0	0
Volume Right	12	0	0	0	32
cSH	646	1700	1700	1700	1700
Volume to Capacity	0.02	0.13	0.13	0.26	0.15
Queue Length (ft)	1	0	0	0	0
Control Delay (s)	10.7	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.7	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	53	340	211	19	9	28
Peak Hour Factor	0.77	0.93	0.86	0.53	0.75	0.75
Hourly flow rate (vph)	69	366	245	36	12	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	281				767	263
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281				767	263
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				97	95
cM capacity (veh/h)	1281				351	775

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	281	49
Volume Left	69	0	12
Volume Right	0	36	37
cSH	1281	1700	599
Volume to Capacity	0.05	0.17	0.08
Queue Length (ft)	4	0	7
Control Delay (s)	1.7	0.0	11.5
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 8:

LOS Analysis for 2021 Base Plus Related Projects Plus Project AM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	3	34	7	1	31
Peak Hour Factor	0.54	0.75	0.83	0.77	0.25	0.69
Hourly flow rate (vph)	28	4	41	9	4	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98	46			50	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	46			50	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	898	1024			1556	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	50	49
Volume Left	28	0	4
Volume Right	4	9	0
cSH	912	1700	1556
Volume to Capacity	0.03	0.03	0.00
Queue Length (ft)	3	0	0
Control Delay (s)	9.1	0.0	0.6
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.6
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	15	0	421	392	17
Peak Hour Factor	1.00	0.60	1.00	0.80	0.81	0.63
Hourly flow rate (vph)	0	25	0	526	484	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	761	255	511			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	761	255	511			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	342	744	1050			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	25	263	263	323	188
Volume Left	0	0	0	0	0
Volume Right	25	0	0	0	27
cSH	744	1700	1700	1700	1700
Volume to Capacity	0.03	0.15	0.15	0.19	0.11
Queue Length (ft)	3	0	0	0	0
Control Delay (s)	10.0	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.0	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	23	146	307	16	24	93
Peak Hour Factor	0.50	0.90	0.89	0.67	0.63	0.74
Hourly flow rate (vph)	46	162	345	24	38	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	369				611	357
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	369				611	357
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				91	82
cM capacity (veh/h)	1190				439	687

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	208	369	164
Volume Left	46	0	38
Volume Right	0	24	126
cSH	1190	1700	608
Volume to Capacity	0.04	0.22	0.27
Queue Length (ft)	3	0	27
Control Delay (s)	2.1	0.0	13.1
Lane LOS	A		B
Approach Delay (s)	2.1	0.0	13.1
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix 9:
LOS Analysis for 2021 Base Plus Related Projects Plus Project PM Peak Hour Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	3	33	7	3	25
Peak Hour Factor	0.80	0.38	0.65	0.63	0.75	0.71
Hourly flow rate (vph)	30	8	51	11	4	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100	56			62	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100	56			62	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	897	1010			1541	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	62	39
Volume Left	30	0	4
Volume Right	8	11	0
cSH	918	1700	1541
Volume to Capacity	0.04	0.04	0.00
Queue Length (ft)	3	0	0
Control Delay (s)	9.1	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	7	0	417	629	29
Peak Hour Factor	1.00	0.42	1.00	0.91	0.94	0.66
Hourly flow rate (vph)	0	17	0	458	669	44
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	920	357	713			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	920	357	713			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	270	640	883			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	229	229	446	267
Volume Left	0	0	0	0	0
Volume Right	17	0	0	0	44
cSH	640	1700	1700	1700	1700
Volume to Capacity	0.03	0.13	0.13	0.26	0.16
Queue Length (ft)	2	0	0	0	0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.8	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	60	340	211	20	13	30
Peak Hour Factor	0.77	0.93	0.86	0.53	0.75	0.75
Hourly flow rate (vph)	78	366	245	38	17	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				786	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				786	264
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				95	95
cM capacity (veh/h)	1279				339	774

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	444	283	57
Volume Left	78	0	17
Volume Right	0	38	40
cSH	1279	1700	558
Volume to Capacity	0.06	0.17	0.10
Queue Length (ft)	5	0	9
Control Delay (s)	1.9	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	1.9	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX J
Sewer Study

SEWER CAPACITY STUDY

235 S. ARROYO DRIVE
SAN GABRIEL, CA

REGISTERED PROFESSIONAL ENGINEER
YEFIM TSALYUK
NO. C052871
EXP. 12/31/2016
CIVIL
STATE OF CALIFORNIA

Prepared by:
Yefim “Jeff” Tsalyuk
11278 Los Alamitos Blvd., #354
Los Alamitos, CA 90720
800-797-9483

TABLE OF CONTENT

SECTION 1. Project Overview

The project is a proposed 45 units residential development in the City of San Gabriel, County of Los Angeles.

The project area, a total of approximately 1.16 acres and located at 235 S. Arroyo Dr., City of San Gabriel.

Existing site is surrounded by residential sites.

Under propose development condition of the site, all onsite sewerage runoff will be collected and discharge into the existing sewer mains within Arroyo Blvd.

This 45 units development consists of:

16 units- 3 bedrooms, 25 units- 2 bedrooms, 4 units- One Bedroom.

Per request of the City of San Gabriel, National Plant Services, Inc. (NPS) performed sewer capacity monitoring from April 22 to April 29, 2015.

SECTION 2. Flow Monitoring – Summary

National Plant Services, Inc. (NPS) obtained an encroachment permit from the City of San Gabriel (City) to perform the requested sewer capacity analysis on the 10-inch diameter sewer line along Arroyo Dr.. at the manhole as shown on Figure 1.
The monitoring was performed from from April 22 to April 29, 2015.

A Flo-Tote 3 electromagnetic sensor and Flo-Logger were used to monitor the flow with measurements recorded every 15 minutes. The manufacturers' specifications for the equipment are included as Attachment 5 of this report.

The Flo-Tote 3 electromagnetic sensor is connected to the Flo-Logger via a cable and measures the velocity and depth of liquids in open channels using electromagnetic sensor technology. The sensor makes use of Faraday's Law of electromagnetic induction to measure water velocity. A pressure transducer is used to measure the depth of the water. The velocity and depth measurements provided by the sensor are used to calculate flow. Flow (also known as Q, flow rate) is the amount of fluid moving through a channel or pipe in a period of time.

Flow is calculated using the Continuity equation:

Flow = Average Velocity × Area ($Q = V \times A$),

where:

- A = cross-sectional area of the channel flow. Cross-sectional area is found using the wetted area dimensions of the channel and the measured flow depth.

- V = average velocity. Average velocity is found using the velocity measured by the sensor.

The results of the flow monitoring are presented in Table 1 and Attachment 6, where velosity (vel), ft/sec.; sewer level (lev); in; flow (flo), gpm

The results are briefly summarized below:
- the maximum flow observed at subject manhole was 74 gpm.

SECTION 3. Flow Capacity Analysis

Per City requirements, sewer lines between 6 inches and 18 inches in diameter are considered at capacity when flowing half full.

Based on Table 7-14 from *Handbook of Hydraulics*, (pg. 7-35, Horace King, 6^{th} Edition, see Attachment 4).

Q_{pipe}=K'/n*d^(8/3)S^0.5,

where:
- Q_{pipe} = flow (cfs)
- K' = conveyance factor (unitless)
- d = diameter of pipe (feet)
- S = slope of pipe (feet/feet)
- n = friction factor (unitless), based on NCPI (National Clay Pipe Institute) *Clay Pipe Engineering Manual* (pg. 23, 2003 Edition), appropriate n values vary from 0.009 to 0.013. The value of n=0.013 has been selected for these calculations.

Per City requirements, we are using County of LA sewer coefficient of 200 gal/day for 1 bedroom dwelling units and 250 gal/day for 2 and more bedroom dwelling units.

This 41 units development consists of:

15 units- 3 bedrooms, 25 units- 2 bedrooms, 1 unit- 4 bedrooms.

The total additional sewer flow from proposed development using 2.5 peak factor would be
2.5 x [41 x 250 gal/day] = 25,625 gal/day = 17.7 gpm =0.039 cfs

The highest measured existing flow observed at manhole is 205 gpm.

The total flow in existing sewer along Arroyo Dr. just downstream of the development would be 205 gpm (0.46 cfs, max measured flow) + 7.7gpm (0.039 cfs, proposed additional flow) = 224 gpm=0.50 cfs.

SECTION 4. Arroyo Dr. Sewer

Since the minimum slope along observed 10” sewer line in Arroyo Dr. is 0.40%, then

Q_{pipe} ½ full=K’/n*d^(8/3)S^0.5= 0.232/0.013 x (0.83^2.67) x 0.0040^0.5=0.68 cfs

which is greater than calculated post development peak flow of 0.48 cfs.

As shown in the Summary Report, the highest level of flow measured (lev.) is D=4.15 in.

Let’s calculate the level of flow in post-development condition,

K’=Q*n/(d^(8/3)S^0.5)= 0.48*0.013/(0.83^2.67x0.004^0.5)=0.16

Based on Table 7-14 from Handbook of Hydraulics, for K’=0.16, D/d=0.41

Then Dnew=0.41x10”=4.15”,

TABLE 1

	D/d (lev.)	Q, cfs peak
Pre-Development Condition	4.15	0.46
Post-Development Condition	4.15	0.50

SECTION 5. Conclusion

The total flow in sewer line along Arroyo Dr. including proposed additional flow (0.50 cfs) is less than available capacity of existing sewer line flowing half full (0.68 cfs).

Attachments

Attachment 1 – Site Plan

Attachment 2 – Map of Flow Monitoring Location

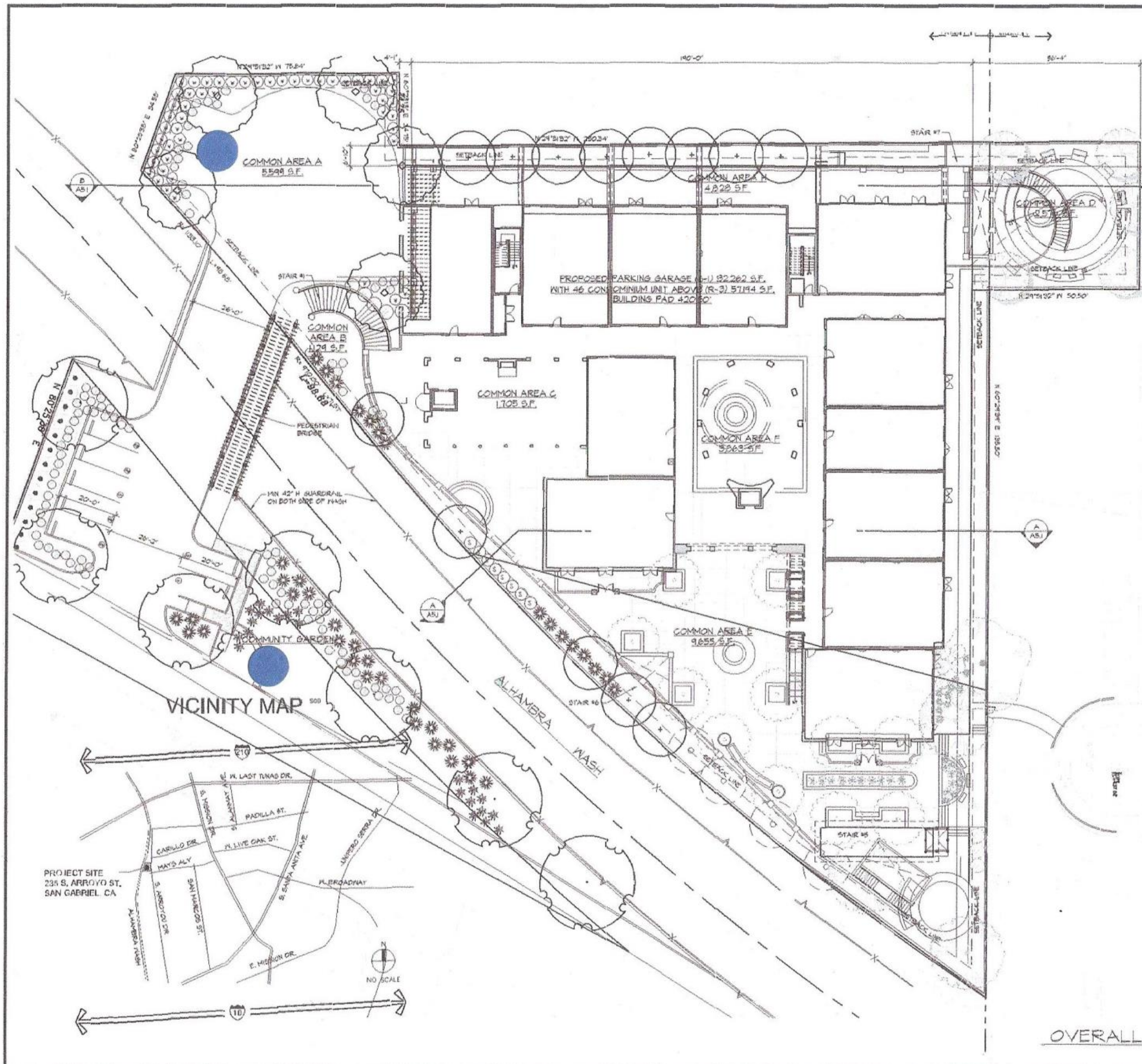
Attachment 3 – City As-Built Drawings

Handbook of Hydraulics

Attachment 5 – Manufacturers’ Specifications for Flow Monitoring Equipment

Attachment 6 – Summary of Flow Monitoring Results


1151
ARROYO DR.
SANTA ANITA
SAN MARCO ST.
Southern Pacific R.R.
McGROARTY
RAMONA BLVD.
VEGA ST
ARROYO DR.
SANTA ANITA
SAN MARCO ST.
CARMELITO ST.
PADILLA ST.
MISSION DR.
LAS TUNAS DR.
BRIDGES ST.
FRANKLIN AVE



PLANNING:

PROJECT NAME: ARROYO VILLAGE (CONDOS)

PROJECT ADDRESS: 235 S. ARROYO DRIVE
SAN GABRIEL, CA

ZONE: R-3 / MISSION DISTRICT SPECIFIC PLAN

TOTAL LOT AREA: 50343 (1.116 AC.) S.F. (WITHOUT WASH)

DENSITY ALLOWED: 50,343 / 1,089 = 46.2 UNITS

FLOOR AREA RATIO:
LOT COVERAGE ALLOWED: 60 %
LOT COVERAGE PROVIDED: 18,245 / 50,348 = 36.2%

OPEN SPACE REQUIRED:

3 BED RM UNIT:	900 x 16 =	14,400 S.F.
2 BED RM UNIT:	600x 25 =	15,000 S.F.
1 BED RM UNIT:	300 X 4 =	1,200 S.F.
TOTAL REQUIRED:		30,600 SF.

OPEN SPACE PROVIDED:

GARAGE FLOOR: 5,599 S.F. (A)
1129 S.F. (B)
6,728 S.F.

FIRST FLOOR: 1,705 S.F. (C)
2,576 S.F. (D)
9,655 S.F. (E)
3,863 S.F. (F)
4,828 S.F. (H)
22,627 S.F.

SECOND FLOOR: 2,710 S.F. (I)
THIRD FLOOR. 2,710 S.F. (J)
1,345 S.F. (K)
FOURTH FLOOR: 2,710 S.F. (L)
9,475 S.F.

TOTAL 37,411 S.F > 30,600 S.F.

BUILDING:

OCCUPANCY GROUP: R3/S1
TYPE OF CONSTRUCTION: TYPE V-B 1 HOUR, FULLY SPRINKLERED

FLOOR AREA.
PARKING GARAGE FLOOR AREA = 36,734 S.F.

LIVING FLOOR AREA:

FIRST FLOOR AREA	= 13,646 S.F.
SECOND FLOOR AREA	= 16,601 S.F.
THIRD FLOOR AREA	= 15,079 S.F.
FOURTH FLOOR AREA	= 11,179 S.F.
TOTAL FLOOR AREA	= 56,505 S.F.

BLDG. HEIGHT ALLOWED: 48'-0"
BLDG. HEIGHT PROVIDED: 44'-0" (TOP OF PLATE)

PARKING REQUIRED:

2 & 3 BED RM.	42 UNIT X 2 = 84 PARKING
1 BED RM	4 UNIT X 2 = 8 PARKING
GUEST	46 UNIT/3 = 16 PARKING
TOTAL REQUIRED	108 PARKING

HANDICAP PARKING REQUIRED: 3 HANDICAP STALL AND 2 VAN

PARKING PROVIDED:
101 (BASEMENT)+10 (OPEN) = 111 SPACE > 109

UNIT MIX

FLOOR PLAN TYPES:

TYPE	S.F.	NO. OF UNITS
A-1 SERIES (3 BED RM)	1,364 S.F.	7
A-2 SERIES (3 BED RM)	1,364 S.F.	9
B (1 BED RM)	881 S.F.	4
C-1 SERIES (2 BED RM)	1,230 S.F.	21
C-2 (2 BDE RM)	1,230 S.F.	4
TOTAL		45 UNIT

OVERALL SITE PLAN 1

DESIGN INSPIRATION GROUP INC.

PROJECT

ARROYO VILLAGE

235 S. ARROYO DRIVE
SAN GABRIEL, CA

SHEET TITLE

SITE PLAN

DRAWN A TJIA
SCALE 1/16"=1'-0"
DATE 08-13-2013
JOB NO. 5319
SHEET NO. A1.0

Section 1 Specifications

Specifications are subject to change without notice.

Table 1 Sensor specifications

General	
Material	Polyurethane
Dimensions	13.1 cm W x 4.4 cm L x 2.8 cm diameter (5.16 in. x 1.73 in. x 1.10 in.)
Weight	1.1 kg (2.4 lb) with 30 ft cable
Operating temperature	0 to 45 °C (32 to 113 °F)
Operating humidity	0-100%
Storage temperature	–20 to 52° C (–4 to 125° F)
Power requirements	10V, 100 mA. Sensor power is supplied by the portable Flo-Logger or by the Flo-Station Monitor.
Velocity measurement	Method: Electromagnetic (Faraday's law)
	Range: –1.5 to 6.1 m/s (–5 to 20 ft/s)
	Accuracy: ± 2% of reading
	Zero stability: ± 0.015 m/s (± 0.05 ft/s) at 0 to 3 m/s (0 to 10 ft/s)
	Resolution: ± 0.0003 m/s (0.01 ft/s)
Depth measurement	Method: Submerged pressure transducer
	Range: Standard 10 mm to 3.5 m (0.4 to 138 inches). Contact the factory for extended ranges
	Accuracy: ± 1% reading
	Zero stability: ± 0.009 m (± 0.03 feet), for 0 to 3 m (0 to 10 ft) Includes non-linearity, hysteresis and velocity effects.
	Resolution: 2.5 mm (0.1 in.)
	Over range protection: 2X range
Flow measurement	Method: Conversion of water level and pipe size to fluid area. Conversion of local velocity reading to mean velocity. Multiplication of fluid area by mean velocity to equal flow rate.
	Conversion accuracy: ± 5.0% of reading. Assumes appropriate site calibration coefficient, pipe flowing 10% to 90% full with a level greater than 5.08 cm (2 in.).
Temperature measurement	Method: 1 wire digital thermometer
	Range: –10 to 85 °C (14 to 185 °F)
	Accuracy: ± 2 °C (± 3.5 °F)
Sensor cable	Material: Polyurethane jacketed
	Standard length: 9.1 m (30 ft)
	Optional length: 18.2 m, 30.4 m (60,100 ft) or length as needed; maximum 304 m (1000 ft)
Warranty	
Warranty	One year from date of shipment. Does not apply to such consumable components, such as, but not limited to, desiccants and batteries.

Table 7-14. Values of K' for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

D = depth of water d = diameter of channel

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0		.00007	.00031	.00074	.00138	.00222	.00328	.00455	.00604	.00775
.1	.00967	.0118	.0142	.0167	.0195	.0225	.0257	.0291	.0327	.0366
.2	.0406	.0448	.0492	.0537	.0585	.0634	.0686	.0738	.0793	.0849
.3	.0907	.0966	.1027	.1089	.1153	.1218	.1284	.1352	.1420	.1490
.4	.1561	.1633	.1705	.1779	.1854	.1929	.2005	.2082	.2160	.2238
.5	.232	.239	.247	.255	.263	.271	.279	.287	.295	.303
.6	.311	.319	.327	.335	.343	.350	.358	.366	.373	.380
.7	.388	.395	.402	.409	.416	.422	.429	.435	.441	.447
.8	.453	.458	.463	.468	.473	.477	.481	.485	.488	.491
.9	.494	.496	.497	.498	.498	.498	.496	.494	.489	.483
1.0	.463									

ARROYO
Summary Report

Velocity Feet Per Second
Level Inches
Flow Gallons Per Minute

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	04/19/15			04/20/15			04/21/15			04/22/15			04/23/15			04/24/15			04/25/15		
	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo
AM																					
Total:															5419.90e1			6450.89e1			6728.45e1
Max:													2.37	3.48	140.70	2.37	3.31	133.97	2.53	3.87	169.93
Min:													1.37	0.94	11.60	1.39	2.26	50.43	1.33	2.26	46.34
Avg:													1.85	2.36	75.28	1.89	2.74	89.60	1.82	2.86	93.45
PM																					
Total:												1110.86e2			6368.71e1			9817.10e1			8666.41e1
Max:										2.38	4.58	235.35	2.29	3.81	172.84	2.28	3.84	172.57	2.37	3.38	149.61
Min:										1.64	2.66	88.60	1.98	0.99	19.23	1.94	2.98	105.42	1.96	2.66	91.23
Avg:										2.16	3.64	154.29	2.13	2.48	88.45	2.13	3.40	136.35	2.21	3.05	120.37
Daily																					
Total:															1178.86e2			1626.80e2			1539.49e2
Max:													2.37	3.48	172.84	2.37	3.84	172.57	2.53	3.87	169.93
Min:													1.37	0.94	11.60	1.39	2.26	50.43	1.33	2.26	46.34
Avg:													1.99	2.42	81.87	2.01	3.07	112.97	2.02	2.96	106.91
Weekly																					
Total:																					
Max:																					
Min:																					
Avg:																					

ARROYO
Summary Report

Velocity Feet Per Second
Level Inches
Flow Gallons Per Minute

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	04/26/15			04/27/15			04/28/15			04/29/15			04/30/15			05/01/15			05/02/15		
	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo	vel	lev	flo
AM																					
Total:			6149.22e1			6543.37e1			6196.41e1			3485.63e1									
Max:	2.40	4.15	204.63	2.31	3.86	177.74	2.32	3.47	152.34	2.38	3.34	147.58									
Min:	1.37	1.74	31.17	1.33	1.75	30.31	1.37	1.82	33.22	1.28	1.82	32.01									
Avg:	1.82	2.57	85.41	1.82	2.72	90.88	1.80	2.67	86.06	1.68	2.41	68.35									
PM																					
Total:			9732.59e1			9055.58e1			8804.54e1												
Max:	2.44	3.68	166.30	2.34	3.86	175.44	2.31	3.56	157.60												
Min:	1.99	2.81	97.81	1.81	2.81	88.27	1.92	2.82	93.55												
Avg:	2.23	3.28	135.17	2.10	3.25	125.77	2.12	3.17	122.29												
Daily																					
Total:			1588.18e2			1559.90e2			1500.09e2			3485.63e1									
Max:	2.44	4.15	204.63	2.34	3.86	177.74	2.32	3.56	157.60	2.38	3.34	147.58									
Min:	1.37	1.74	31.17	1.33	1.75	30.31	1.37	1.82	33.22	1.28	1.82	32.01									
Avg:	2.02	2.92	110.29	1.96	2.98	108.33	1.96	2.92	104.17	1.68	2.41	68.35									

Weekly			
Total:			4,996.73e2
Max:	2.44	4.15	204.63
Min:	1.28	1.74	30.31
Avg:	1.95	2.89	103.45