HELIX Environmental Planning

Crescent Drive Sewer Improvements Project

Addendum to the 2017 Comprehensive Sewer Master Plan Supplemental Program Environmental Impact Report for the City of Vista/ Buena Sanitation District

March 2020 | KEH-01

Prepared for:

KEH & Associates
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Prepared by:

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

Crescent Drive Sewer Improvements Project

Addendum to the 2017 Comprehensive Sewer Master Plan Supplemental Program Environmental Impact Report for the City of Vista/Buena Sanitation District

Prepared for:
KEH & Associates
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

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

March 2020 | KEH-01

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

1.0 INTRODUCTION AND PROJECT DESCRIPTION

This environmental document is the fourth Addendum to the certified Supplemental Program Environmental Impact Report (SPEIR; State Clearinghouse [SCH] #2007091072) for the City of Vista (City)/Buena Sanitation District (District) Comprehensive Sewer Master Plan (CSMP) addressing the currently proposed Crescent Drive Sewer Improvements Project (project). The 2017 CSMP SPEIR updates and tiers from the 2008 Sewer Master Plan Update PEIR (2008 PEIR). This document has been prepared in conformance with the provisions of the California Environmental Quality Act (CEQA; California Public Resources Code, Division 13, Environmental Quality) and the State Guidelines for the Implementation of CEQA (CEQA Guidelines; Title 14, California Code of Regulations, Chapter 3). In accordance with CEQA Guidelines Section 15164, this document tiers from the more recently certified 2017 CSMP SPEIR which updates the 2008 PEIR and is therefore considered the second Addendum to the Final 2017 CSMP SPEIR (hereinafter referred to simply as "Addendum"). The City is the Lead Agency (as defined by CEQA) for environmental review of the project and approval of this Addendum.

1.1 Project Location

The project is located within the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties in the city of Vista. See Figure 1, *Crescent Drive Vicinity Projects Identified in CSMP*, and Figure 2, *Sewer Line and Lateral Improvements*.

1.2 Project Background

Both the 2008 and 2017 Sewer Master Plan Updates were developed to restore the City's sewer system to an acceptable physical condition, provide adequate hydraulic capacity to minimize sanitary sewer overflows, and address newly approved State wastewater regulations. The 2008 PEIR and 2017 CSMP SPEIR provide comprehensive analyses of the sewer system and needed improvements through a combination of operations input, maintenance assessments, and hydraulic modeling resulting in several capacity- and condition-related capital improvement program (CIP) recommendations involving thousands of sewer components, including those related to the proposed project (CIP #8286).

Two projects in the vicinity of the project site were identified in the 2017 CSMP. The projects, V22058-V22059 and V22059-V22060, were considered as a "Category 1: CIP Capacity and Condition Project (Hardscape Environs)." Other project categories included in the 2017 CSMP include "Category 2: CIP Capacity and Condition Projects (Cross-Country Environs)"; "Category 3: O&M Program Operations and Pump Station Operations, Maintenance, and Rehabilitation"; and "Category 4: Out-of-Service Area Project(s)." The proposed project would incorporate these two projects identified in the CSMP, as well as provide additional upgrades along Crescent Drive, Avalon Drive, and Sabrina Way.

The previous 2017 CSMP SPEIR concluded that Category 1 projects would result in temporary construction-related environmental impacts with respect to the following issues, which would be reduced to less than significant levels with implementation of identified mitigation measures: biological resources, cultural resources, accidental releases of hazardous materials, emergency response plans/emergency access, noise levels, traffic operations, transportation design hazards, and conflicts with alternative transportation plans. These significant impacts and associated mitigation measures are summarized in Table ES-1 of the 2017 CSMP SPEIR.

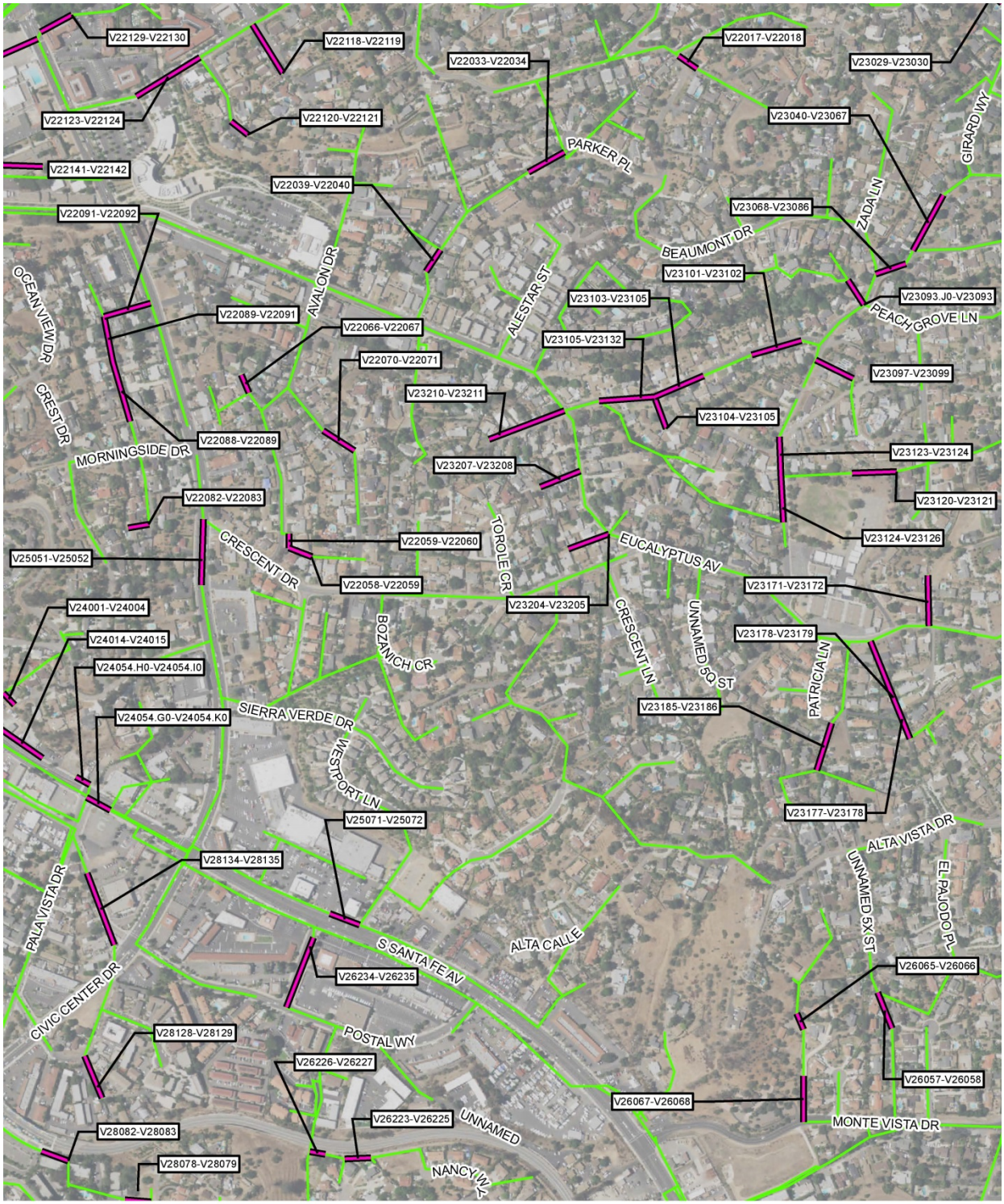
Although the alignment for the proposed project differs from those identified in the previous CSMP SPEIR, the above-listed environmental impacts and required mitigation measures for the currently proposed project would be similar to those previously evaluated for Category 1 projects. As such, the project would not result in any new significant environmental impacts or mitigation measures compared to those evaluated in the previous 2008 PEIR and 2017 CSMP SPEIR, nor would it result in a greater degree of significance of impacts. For these reasons, CEQA review of this project does not warrant preparation of another subsequent or a supplemental EIR or MND. Therefore, the proposed project that is the basis of this Addendum may be approved by the City as a subsequent activity covered within the scope of the 2017 CSMP SPEIR.

1.3 Project Description

The project consists of abandoning 450 feet of existing 6-inch vitrified clay pipe (VCP) sewer and installing 712 feet of new 8-inch polyvinylchloride (PVC) pipe within the public rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way. The majority of the existing VCP sewer is in an easement that runs along the northern portions of five private properties on Crescent Drive. Portions of the existing VCP sewer are also located within four private residences along Avalon Drive (refer to Figure 2). The location of the existing VCP sewer within these properties presents challenges in regards to accessing the sewer and performing maintenance activities and creates substantial disturbance for the residents located along the sewer alignment while these access and maintenance activities are being performed. The project would require the installation and connection of 11 new 4-inch sewer laterals from private properties to the new sewer pipeline. The proposed project would contribute to the goals included in the 2017 CSMP SPEIR, which are to reduce the potential for sewer overflows, implement capacity improvements, where required, and restore, maintain, and/or enhance existing sewer service consistent with the City's adopted Sewer System Management Plan (City of Vista 2014).

Project construction would involve trenching, installing the new pipeline, backfilling, and repaving affected portions of the street and private properties. Construction activities would occur in the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within several properties developed with single-family residential units on Crescent Drive and Avalon Drive. Construction activity would require approximately 120 working days to complete. The existing sewer main and manholes would be protected in place until the new sewer is tested, approved, and placed into service. All existing landscaping and hardscaping that conflicts with the installation or proper function of the proposed improvements would be removed, and/or relocated upon installation of the proposed sewer main and laterals.

The project would require trenching excavation activities requiring the use of a concrete saw. A temporary moveable 6-foot noise barrier would be utilized between the concrete saw and residences for the duration that the concrete saw is within 120 feet of residences. The temporary barriers used would be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks would be filled or caulked. If wood is used, it would be tongue and groove or close butted seams and would be at least 3/4-inch thick or have a surface density of at least 3.5 pounds per square foot.



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Addendum\Fig1_RelatedProjects.indd KEH-01 04/08/19 -RK

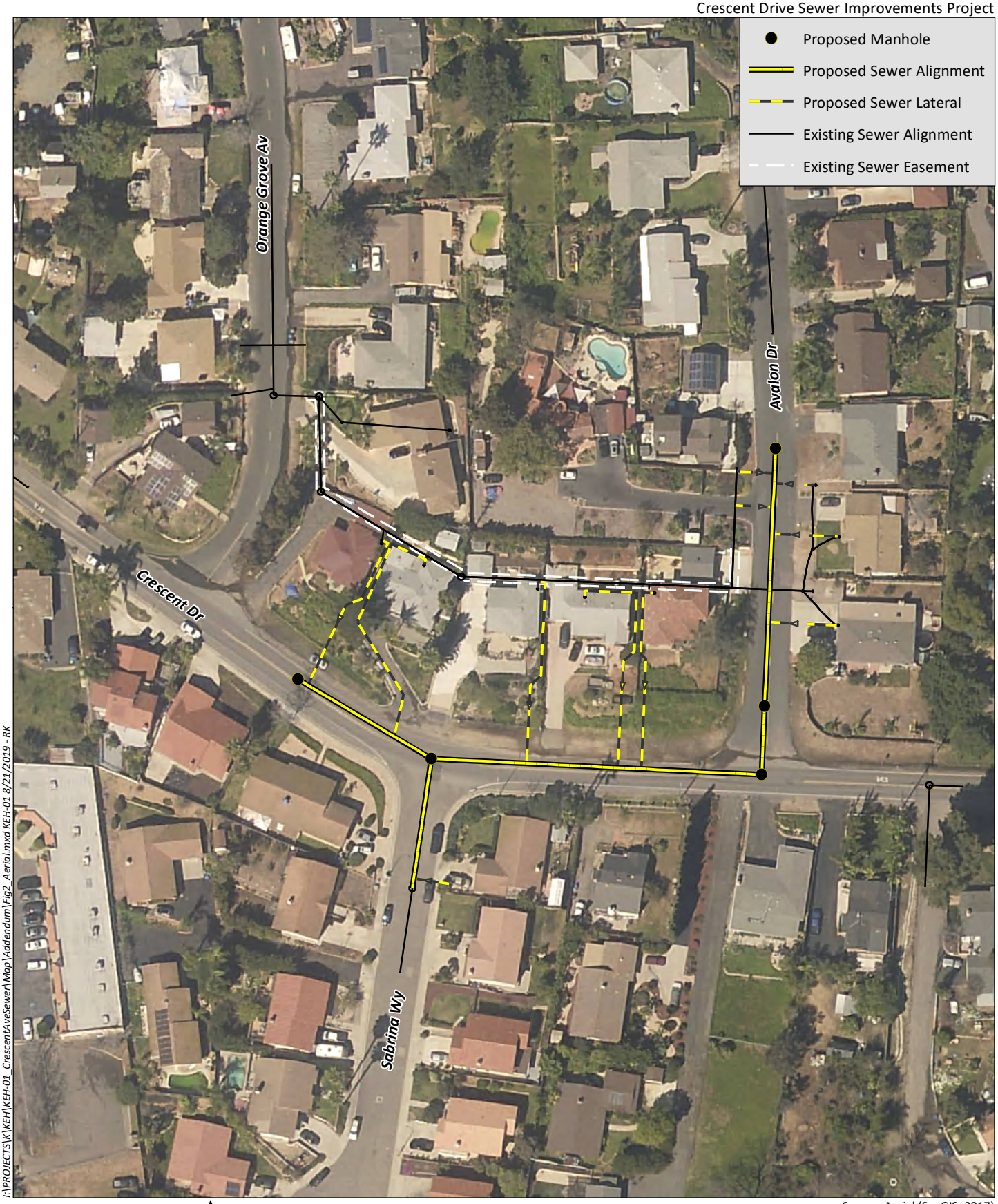
Source: City of Vista CSMP SPEIR 2017

HELIX Environmental Planning

Crescent Drive Vicinity Projects Identified in CSMP

Figure 1

Crescent Drive Sewer Improvements Project



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Addendum\Fig2_Aerial.mxd KEH-01 8/21/2019 - RK

0 100 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Sewer Line and Lateral Improvements

Figure 2

1.4 Purpose of this Addendum and Basis for Decision to Prepare Addendum

The previous 2008 PEIR and 2017 CSMP SPEIR referenced above comply with CEQA Guidelines §15168(a), which requires that a programmatic environmental document be prepared for a series of actions that can be characterized as one large program, with each action related as logical parts in the chain of contemplated actions. Typically, such a program can involve individual activities/projects carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways (§15168[a][4]). PEIRs generally analyze broad environmental effects of the program acknowledging that site-specific environmental reviews may be required for subsequent implementing activities/projects. When a subsequent project within the program is proposed for implementation, it must undergo additional CEQA review (§15168[c]) to confirm whether it would result in any new significant environmental effects or increase the severity of any previously identified environmental effects. CEQA Guidelines §§15162-15164 provide the circumstances under which a subsequent project that has been evaluated in a previously certified PEIR may warrant a subsequent EIR or Mitigated Negative Declaration (MND), a supplement to an EIR or MND, or an Addendum to an EIR or MND, based on the significance or severity of new or increased environmental impacts that could result from project changes, new information, changing circumstances, or changes to mitigation measures or alternatives. If determined that a subsequent project would not have any new or greater significant environmental effects than what was concluded for that project in a PEIR, then a subsequent or supplemental EIR or MND is not required, and the Lead Agency may rely on a CEQA Addendum to approve the subsequent project (§15164[a] and [b]).

For CIP #8286, the currently proposed project is different from its counterparts as described and evaluated as “V22058-V22059” and “V22059-V22060” in the 2017 CSMP. The analysis in this Addendum is based on detailed design plans for CIP #8286 involving a series of new pipeline and lateral improvements, and pipeline abandonments (refer to Figure 2). As stated above, this document incorporates by reference the pertinent 2017 CSMP SPEIR conclusions as it relates to the project. In this way, the analysis in this Addendum augments/updates the previous analysis of Category 1 projects discussed in the 2017 CSMP SPEIR, as well as the accompanying CEQA Findings.

Pursuant to CEQA Guidelines §15164(e), the purpose of the analysis is to demonstrate why the presence of changed circumstances or new information relative to the project, since the 2017 CSMP SPEIR was certified, does not trigger the need for a subsequent EIR or MND, to provide justification for the preparation and use of this Addendum. Pursuant to CEQA Guidelines §15164(d), this Addendum is intended to inform the City’s consideration and action on the project. City approval of this Addendum requires concurrence by the Community Development Director that all procedures required by the City were followed. Pursuant to CEQA Guidelines §15164(c), this Addendum need not be circulated for public review.

The project could potentially result in one or more of the following environmental effects.

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

1.5 Determination

On the basis of this initial evaluation:

■	I find that the proposed project WOULD NOT have any significant effects on the environment that either have not already been analyzed in the prior SPEIR or that are more significant than previously analyzed. Pursuant to CEQA Guidelines Section 15168(c), CEQA does not apply to such effects. A Notice of Determination (Section 15094) will be filed.
☐	I find that the proposed project will have effects that either have not been analyzed in the prior SPEIR or are more significant than described in the prior SPEIR. With respect to those effects that are subject to CEQA, I find that such effects WOULD NOT be significant and a NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project will have effects that either have not been analyzed in the prior SPEIR or are more significant than described in the prior SPEIR. I find that although those effects could be significant, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project would have effects that either have not been analyzed in a prior SPEIR or are more significant than described in the prior SPEIR. I find that those effects WOULD be significant, and an ENVIRONMENTAL IMPACT REPORT is required to analyze those effects that are subject to CEQA.

John Conley — Signature

9/1/2020 — Date

John Conley — Printed Name

City of Vista — For

1.6 Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. For the purposes of this checklist, “prior SPEIR” means the environmental impact report certified for the 2017 CSMP.

4. Once the lead agency has determined that a particular physical impact may occur as a result of an improvement contemplated under the CSMP, then the checklist must indicate whether that impact has already been analyzed in the prior SPEIR or whether the new significant impact is due to unusual circumstances or substantial new information, as indicated in the column headings. If the effect of the project is not more significant than what has already been analyzed, that effect of the project is not subject to CEQA. The brief explanation accompanying this determination should include page and section references to the portions of the prior SPEIR containing the analysis of that effect. The brief explanation shall also indicate whether the prior SPEIR included any mitigation measures to substantially lessen that effect and whether those measures have been incorporated into the project.

5. If all effects of an improvement contemplated under CSMP were analyzed in the prior SPEIR, CEQA does not apply to the project, and the lead agency shall file a Notice of Determination.

6. Effects of an improvement contemplated under CSMP that has not been analyzed in a prior EIR are subject to CEQA. With respect to those effects of individual improvements contemplated under CSMP that are subject to CEQA, the checklist shall indicate whether impacts have been previously analyzed in the SPEIR, new significant impacts due to unusual circumstances or substantial new information, less than significant impact with SPEIR mitigation measures applied, less than significant impact, or no impact If there are one or more “Significant Impact” entries when the determination is made, an EIR is required. The EIR should be limited to analysis of those effects determined to be significant. (Section 15128).

7. “SPEIR Mitigation Measure(s) Applicable” applies where the incorporation of mitigation measures from the SPEIR will reduce an effect of a project that is subject to CEQA from "Significant Impact" to a “Less Than Significant Impact.” The lead agency must describe the SPEIR mitigation measures, and briefly explain how those measures reduce the effect to a less than significant level.

8. The explanation of each issue should identify:

    a. the significance criteria or threshold, if any, used to evaluate each question; and

    b. the mitigation measure identified, if any, to reduce the impact to less than significance.

2.0 ENVIRONMENTAL INITIAL STUDY CHECKLIST

I. AESTHETICS

AESTHETICS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Have a substantial adverse effect on a scenic vista?	☐	☐	■	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	■	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	■	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	■	☐	☐

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

No Impact. Once installed, the proposed sewer pipeline and laterals would be belowground and would not have an effect on scenic vistas that may occur within or near the project site. Therefore, no impacts would occur relative to this issue.

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

No Impact. The highway nearest the project site is State Route (SR-) 78, which is approximately 0.6 mile to the southwest. The project site is not within view of SR-78 due to intervening topography and structures. In addition, this portion of SR-78 is not designated as a scenic highway (California Department of Transportation [Caltrans] 2018). Therefore, the project would not damage scenic resources within a state scenic highway and no impacts would occur relative to this issue.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant Impact. The project involves installation of a belowground sewer pipeline and laterals, which would not be visible and would therefore not degrade the existing visual character or quality of the site and its surroundings. Potential construction-related aesthetic impacts associated with the presence of construction equipment and trenches within the roadway would be short-term. Therefore, impacts relative to this issue would be less than significant.

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

No Impact. Upon completion of the sewer installation, the project would not include aboveground features that would result in lighting or glare effects. Construction would occur during the daytime and would not require lighting. Therefore, no impact would occur relative to this issue.

II. AGRICULTURE AND FORESTRY RESOURCES

AGRICULTURE AND FORESTRY RESOURCES: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	■	☐	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	■	☐	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	■	☐	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	■	☐	☐
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non- forest use?	☐	☐	■	☐	☐

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

No Impact. The project site is located in an urbanized area. According to mapping available from the California Department of Conservation Important Farmland Finder (California Department of Conservation 2016) the project site is mapped as “Urban and Built-Up Land” and does not support agricultural uses. The project site does not contain lands mapped by the California Department of

Conservation as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (California Department of Conservation 2016). Therefore, no impacts would occur relative to this issue.

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

No Impact. There are no lands zoned for agricultural use, nor are there lands under a Williamson Act contract, located within or near the project site. Therefore, no impacts would occur relative to this issue.

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

No Impact. The project site is located in an urbanized area. There are no lands zoned for forest or timber production located within or near the project site. Therefore, no impacts would occur relative to this issue.

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

No Impact. The project site is located within an urbanized area. There is no forest land within or near the project site and the project would not result in the loss of forest land or conversion of forest land to non-forest use. Therefore, no impacts would occur relative to this issue.

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

No Impact. The project site does not support agricultural or forestry uses, and implementation of the proposed project would not involve changes in the existing environment that would result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. Therefore, no impacts would occur relative to this issue.

III. AIR QUALITY

AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	■	☐	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	■	☐	☐

AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	■	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	■	☐	☐

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

Less Than Significant Impact.

Direct Effects – Construction and Operations: The project site is within the San Diego Air Basin (SDAB), which is regulated by the San Diego Air Pollution Control District (SDAPCD). The SDAPCD monitors air pollution, implementation of the County of San Diego's (County) portion of the State Implementation Plan (SIP), and application of the SDPACD Rules and Regulations. The SIP contains strategies and tactics to be applied as part of the Regional Air Quality Strategy (RAQS) in order to maintain acceptable air quality in the County. The RAQS is the applicable air quality plan for the proposed project.

Consistency with the RAQS is determined by whether a project would: (1) exceed assumptions contained in the RAQS; and (2) increase the frequency or severity of violations of existing air quality standards, contribute to new violations, or delay the timely attainment of air quality standards or interim reductions as contained in the RAQS.

The air quality assumptions, emission projections, and emission reduction strategies in the RAQS are based on the information for the California Air Resources Board (CARB) and San Diego Association of Governments (SANDAG) regarding mobile and area source emissions, as well as growth in the County (including the City). The CARB mobile source emission projections and SANDAG growth projections are derived from population and vehicle use trends, and land use plans developed by cities and counties as part of their general plans. A project that proposes development consistent with the growth anticipated in a general plan would be consistent with the RAQS.

The proposed project would not result in changes to the City's General Plan land use designations and would not generate growth. It would therefore be consistent with the City's General Plan. In addition, as analyzed in the 2017 CSMP SPEIR, construction emissions from CSMP projects are not expected to

exceed the SDAPCD thresholds or obstruct implementation of the RAQS for the SDAB. Impacts would be less than significant.

Indirect Effects: The proposed project would provide infrastructure to accommodate existing residential developments; as such, it would not generate additional population growth or serve unplanned growth. No indirect impacts would occur.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant Impact. The SDAPCD sets daily significance thresholds for the following criteria air pollutants: reactive organic gases (ROG), nitrogen oxides (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), and respirable particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). The closest air quality monitoring station to the project operated by SDAPCD is located at McClellan-Palomar Airport (SDAPCD 2015). A project's exceedance of the thresholds would cause a significant air quality impact which could result in violations of air quality standards and/or result in substantial contributions to existing/projected air quality violations.

Direct Effects – Construction: Short-term emissions would occur during construction in the forms of fugitive dust (PM_{10} and $PM_{2.5}$) from earth moving activities (trenching) and exhaust emissions (ROG, NO_X, CO, SO_2) from operation of construction equipment, material delivery trucks, and worker vehicles.

The project would not require substantial grading, as earth-moving activities would be limited to trenching. In addition to standard dust control practices required by SDAPCD, the City enforces the following best management practices (BMPs) as conditions of Grading Permit issuance to contain and reduce construction-related fugitive dust emissions:

- Water graded areas a minimum of twice daily;
- Remove visible track-out into traveled public street within 30 minutes of occurrence;
- Cover haul trucks or maintain at least 12 inches of freeboard to reduce export soil blow-off during hauling; and
- Stabilize graded areas (e.g., hydroseeding, landscaping) as quickly as possible following project completion.

Exhaust emissions from equipment and vehicles vary from day to day, depending on type and intensity of construction activity. The use of construction equipment for the proposed project would be short-term and limited to a few pieces of equipment within the roadways, based on the relatively small size of the project. It is assumed that trenching, pipeline installation, backfilling, and other ground restoration activities within the private properties would be conducted with hand tools and would not require heavy motorized equipment.

The 2008 PEIR analyzed a conservative scenario of criteria pollutant emissions from implementation of the CSMP, under which all near-term capacity-related improvements, up to 11,781 feet of pipeline installation, would occur in a single year. The analysis determined that emissions under this conservative scenario would not exceed applicable thresholds. The conclusions from that analysis were carried over

into the 2017 CSMP SPEIR. Due to the limited size of the proposed project in comparison to what was analyzed as part of the conservative scenario, construction of the proposed project is not anticipated to exceed SDAPCD daily significance thresholds for criteria air pollutants. Therefore, the project's construction would not exceed an air quality standard or contribute substantially to an existing or projected air quality violation. Impacts relative to this issue would be less than significant.

Direct Effects – Operations: The proposed sewer would be passive and would not include new sources of operational air pollution. Maintenance of the sewer would involve worker vehicle trips to inspect the sewer facilities. The 2017 CSMP EIR analyzed air pollutant emissions associated with 15 maintenance workers, or 30 daily trips, and concluded that emissions from ongoing maintenance would be well below SDAPCD thresholds. Based on its relatively small size, it is likely that maintenance of the proposed project would require less than 15 workers and would therefore generate less emissions than what was analyzed in the 2017 CSMP EIR. As such, operational emissions associated with the project would be less than the established thresholds, and impacts would be less than significant.

Indirect Effects: Implementation of the project would not result in indirect criteria pollutant emissions. The proposed project would provide infrastructure to accommodate existing residential developments; as such, it would not generate additional population growth that could generate air pollutant emissions. No indirect impacts would occur.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Less Than Significant Impact.

Direct Effects – Construction

The SDAB is designated as nonattainment for the federal standard for ozone and the state standards for ozone, PM_{10}, and $PM_{2.5}$. As such, significant cumulative air quality impacts in the SDAB could occur in association with emissions of the ozone precursors volatile organic compounds (VOCs) and NO_X, as well as PM_{10} and $PM_{2.5}$. Cumulatively considerable net increases during the construction phase would typically occur if two or more projects in close proximity to each other undergo construction simultaneously, or if a project's VOC, NO_X, PM_{10}, or $PM_{2.5}$ emissions exceed SDAPCD thresholds. Due to the developed residential nature of the proposed project area and the proposed project's short-term construction period, it is not anticipated that that the proposed project's construction would occur adjacent to and at the same time as another construction project. In addition, as described above in Section III.b, the project's construction criteria pollutant emissions would be below SDAPCD thresholds. Therefore, potential cumulative air quality impacts associated with project construction would be less than significant.

Direct Effects – Operations: Based on the minimal amount of emissions that would occur from ongoing maintenance activities (as discussed in Item III.b above), potential cumulative air quality impacts associated with project operation would be less than significant.

Indirect Effects – Implementation of the project would not result in indirect criteria pollutant emissions. The proposed project would provide infrastructure to accommodate existing residential developments; as such, it would not generate additional population growth that could generate air pollutant emissions that would contribute to a cumulatively considerable impact. No indirect impacts would occur.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact.

Direct Effects – Construction and Operations: Sensitive receptors (i.e., children, senior citizens, and acutely or chronically ill people), are more susceptible to the effects of air pollution than the general population. Land uses considered as sensitive receptors typically include residences, schools, playgrounds, childcare centers, hospitals, convalescent homes, and retirement homes. The closest sensitive receptors to the proposed project's construction and operational maintenance activities would be the single-family homes located along the project alignment on Crescent Drive, Sabrina Way, and Avalon Drive. It is assumed that trenching, pipeline installation, backfilling, other ground restoration activities, and operational maintenance activities within the private properties would be conducted with hand tools and would not require heavy motorized equipment. During the short-term construction period within the roadways, diesel exhaust particulate matter would be generated by construction equipment and vehicles. Diesel exhaust particulate matter is known by the State of California to include carcinogenic compounds, and long-term exposure to diesel exhaust emissions has the potential to result in adverse health effects. The risks associated with exposure to carcinogenic substances are typically based on a lifetime of chronic exposure, which defined in the California Air Pollution Control Officers' Associated Air Toxics "Hot Spots" Program Risk Assessment Guidelines as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Accordingly, given the short-term nature of the proposed project's construction period, potential impacts related to exposure of existing sensitive receptors to substantial pollutant concentrations (including diesel exhaust) would be less than significant.

Indirect Effects: The project would not indirectly generate pollutants and would therefore not expose sensitive receptors to substantial pollutant concentrations. No impacts would occur.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact.

Direct Effects – Construction: Potential construction-related sources of odors include asphalt during repaving of the roadway and diesel emissions from construction equipment. Due to the relatively small size of the project and short-term nature of construction, the project would not expose a substantial number of people to odors for an extended period of time, and impacts would be less than significant.

Direct Effects – Operations: Although odors periodically emanate from sewer manholes, the project would relocate manholes to locations that would be further away from residences than their existing locations, which would likely reduce exposure to odors; however, since the proposed manholes would still be in proximity to the residences, there is potential for nuisance odors at the nearby residences, and the project would comply with SDAPCD Rule 51. SDAPCD Rule 51 prohibits emissions, including odor emissions, from any source whatsoever in such quantities of air contaminants or other material, which cause injury, detriment, nuisance, or annoyance to public health of damage to property. Therefore, impacts related to operational odors would be less than significant.

Indirect Effects: The project would not result in indirect effects related to odors. The project does not include off-site components or facilitate additional projects that would generate new sources of odor. No impacts would occur.

IV. BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	■	☐	☐	■	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	■	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	■	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	■	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	■	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	■	☐	☐

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

SPEIR Mitigation Measure Applicable.

Direct Effects – Construction: Project construction would occur in existing roadways and developed residential properties within an urban area. Although project trenching within residential properties

may disturb or require removal of landscaped vegetation, such vegetation is anticipated to be predominately ornamental and/or not of high-quality habitat. However, given that special status bird species covered under the Migratory Bird Treaty Act (MBTA), such as white-tailed kite, are known to inhabit ornamentals, including non-native street trees, these species would be impacted by project construction if it occurs during the breeding season. Nest abandonment would be considered a potentially significant impact. Mitigation measure BIO-1 is proposed, consistent with the 2017 CSMP SPEIR, to minimize potential impacts to MBTA protected species.

Direct Effects – Operations: Operational maintenance activities would occur in developed (e.g., hardscape environs and roadway rights-of-way) and disturbed areas and would not require the removal of vegetation. Operational impacts to special status species and their habitats are unlikely, and this impact is considered less than significant.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts to special status species or their habitats. No impact would occur.

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

No Impact.

Direct Effects – Construction and Operations: The project would occur in existing roadways and developed residential properties within an urban area and would not have a substantial adverse effect on riparian or other sensitive natural community. No impact would occur relative to this issue.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts to riparian habitat or other sensitive natural communities. No impact would occur.

c) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact.

Direct Effects – Construction and Operations: The project would occur in existing roadways and developed residential properties within an urban area and would not have a substantial adverse effect on wetlands. No impact would occur relative to this issue.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts to wetlands. No impact would occur.

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

No Impact.

Direct Effects – Construction and Operations: The project would occur in existing roadways and developed residential properties within an urban area. There are no wildlife corridors or nursery sites within the project area. Therefore, no impact would occur relative to this issue.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts to wildlife movement. No impact would occur.

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

No Impact.

Direct Effects – Construction and Operations: The project would occur in existing roadways and developed residential properties that do not contain sensitive or protected biological resources. Therefore, the project would not conflict with any policies or ordinances pertaining to biological resources. No impact would occur relative to this issue.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts related to conflict with policies or ordinances pertaining to biological resources. No impact would occur.

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

No Impact.

Direct Effects – Construction and Operations: The City is a participating entity in the North County Multiple Habitat Conservation Program (MHCP). The MHCP is a comprehensive, multi-jurisdictional planning program designed to develop an ecosystem preserve in the northwestern part of the County of San Diego. Due to the developed nature of the project site and surrounding areas and lack of sensitive biological resources at the site, the project would not conflict with provisions of the MHCP. No impacts would occur relative to this issue.

Indirect Effects: Once constructed, these improvements would be located underground and would not result in indirect impacts related to conflict with the MHCP. No impact would occur.

Mitigation

2017 CSMP SPEIR Mitigation Measure BIO-1: MBTA Nest Avoidance. If construction activities occur between January 15 and September 15, a preconstruction survey (within seven days prior to construction activities) shall be conducted by a qualified biologist to determine if active nests are present within or adjacent to the area proposed for development in order to avoid the nesting activities

of breeding birds/raptors. The results of the survey shall be submitted to the City (and made available to the Wildlife Agencies, upon request) prior to initiation of any construction activities.

If nesting activities within 200 feet of the proposed work area are not detected, construction activities may proceed. If nesting activities are confirmed, construction activities shall be delayed within an appropriate buffer (e.g., 300 feet) from the active nest until the young birds have fledged and left the nest or until the nest is no longer active as determined by a qualified biologist based on field conditions. The results of all biological monitoring shall be submitted to the City (and made available to the Wildlife Agencies, upon request).

V. CULTURAL RESOURCES

CULTURAL RESOURCES: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	■	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	■	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	■	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	■	☐	☐	■	☐
e) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code §21074?	■	☐	☐	■	☐

A project-specific Archaeological Survey Report was prepared for the project by HELIX Environmental Planning (HELIX 2019; Appendix A) and fulfills the requirements of 2017 CSMP SPEIR mitigation measure CULT-2. The results of the survey are presented below.

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No Impact.

Direct Effects – Construction and Operations: The project-specific Archaeological Survey Report prepared for the project included a records search at the South Coast Information Center (SCIC), a review of historic maps and aerials, and a pedestrian survey to determine the potential presence of historic resources. The records search indicated that 26 cultural resources have been recorded within a

one-mile radius of the project site. Of these 26 resources, six are historic sites, five are historic buildings, and seven are historic structures; however, no historic resources were identified within or adjacent to the project site.

While Crescent Drive has been in its current alignment for at least 80 years, it is not one of the main or original roads established in the city or the general region. It does not appear on the Government Land Office survey plats from the 1800s, nor is it on the 1893 or 1901 United States Geological Survey 15-minute Escondido quadrangle topographic maps. It is a typical residential road, and by the early 1900s is one of hundreds in the vicinity. The roadway has been maintained throughout its existence; in the 1950s it appears to have been further graded and widened for the construction of the residences along the roadway. As visible on historic aerial photographs, throughout the subsequent years, the road appears to continuously be maintained, paved, and striped, with sidewalks and bikeway being constructed along the south side of Crescent Drive by 1980. Furthermore, the project does not propose a realignment, and the impacts to the roadway will be temporary. A such, the roadway does not warrant recordation and evaluation as a historical resource under CEQA. No additional historic resources were identified during the pedestrian survey of the project site. Therefore, no impacts during the project's construction or operational maintenance activities would occur relative to this issue.

Indirect Effects: Construction activities can result in varying degrees of ground vibration, depending on the types of equipment used and methods of construction employed. Construction activities known to generate high levels of ground-borne vibration that would have the potential to adversely affect fragile historic structures include pile driving and the use of a vibratory roller for soil compaction. Pile driving would not be required for the project and a vibratory roller would not be used due to trench size constraints. Other construction equipment to be used would not generate substantial ground-borne vibration.

Based on the results of the project-specific Archaeological Survey Report (HELIX 2019) and a review of historic aerials, nine residential structures located within 25 feet of the proposed new sewer pipeline or sewer laterals were constructed in the 1950s or 1960s. As such, the structures would meet the 50-year threshold for consideration for listing in the California Register of Historical Resources; however, as post-World War II structures, they are likely not fragile historic structures and would not be impacted by the proposed project activities. None of the nine structures within 25 feet of the project alignment were recorded or evaluated as part of the *Historic Resource Survey, A Project of the City of Vista* (Marben-Laird Associates 1987) or are on file at the South Coastal Information Center (SCIC) as a historic address. Therefore, no indirect impacts would occur.

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

Less Than Significant Impact.

Direct Effects – Construction and Operations: The project-specific Archaeological Survey Report was completed to fulfill 2017 CSMP SPEIR mitigation measures CULT-2 and CULT-3. Per the requirements of the mitigation measures, the report included a records search at the SCIC, a Sacred Lands File Search, review of historic maps and aerials, a pedestrian survey to determine the potential presence of archaeological resources at the project site, and an assessment for potential monitoring.

The records search indicated that 26 cultural resources have been recorded within a one-mile radius of the project site. Of these resources, five are prehistoric campsites, one is a prehistoric adobe structure,

two are prehistoric bedrock milling stations, and the remaining 18 are associated with historical resources. None of the eight archaeological resources are located within or adjacent to the project site.

The Native American Heritage Commission (NAHC) indicated that a Sacred Lands File search was conducted with negative results. Three responses were received from the letters sent to contacts provided by the NAHC. The Rincon Band of Luiseño Indians responded that the project area is within the Territory of the Luiseño people and within the tribe's specific area of historic interest. The response notes the Luiseño place name of *ámá 'chave*, located less than a half-mile to the northeast of the project site. The Pala Band of Mission Indians responded that the project area is within the boundaries of the territory that the tribe considers its Traditional Use Area and requested to be kept informed of the project. They also recommend archaeological monitoring given the known proximity of cultural and historic resources. The Viejas Band of Kumeyaay Indians responded that the project area has cultural significance or ties to the Kumeyaay Nation. They recommend that the San Pasqual Band of Mission Indians (San Pasqual) be contacted, and request that all relevant environmental laws be followed, and that San Pasqual be contacted on any project changes or inadvertent discoveries.

The project site was surveyed for cultural resources by HELIX and Saving Scared Sites in May 2018. The entire project area was found to be highly disturbed by modern residential development and non-native landscaping. Accessible portions of the project area, primarily along the road shoulders, were intensively surveyed. No archaeological resources were observed.

Based on the archival research and field survey, no cultural resources were identified within the project site and it is unlikely that subsurface resources are present. Archaeological monitoring was therefore not recommended in the project-specific Archaeological Survey Report, as the project is not anticipated to cause a substantial adverse change in the significance of an archaeological resource (HELIX 2019). Impacts relative to this issue would be less than significant.

Indirect Effects: The proposed project would not induce new growth that could intrude on areas with the potential for archaeological resources. No indirect impacts are identified.

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

No Impact.

Direct Effects – Construction and Operations: Project trenching is anticipated to occur at depths of approximately 10 feet to accommodate the proposed sewer line's maximum depth of approximately 9 feet. According to Table 4.3-1 of the 2017 CSMP SPEIR, the project area is underlain by geologic deposits of the Peninsular Ranges Batholith, which is a formation with zero paleontological sensitivity. No visible outcrops or other unique geological features were observed during the pedestrian survey conducted for the project-specific Archaeological Survey Report. Therefore, no impacts would occur relative to this issue.

Indirect Effects: The proposed project would not result in secondary effects or new growth that could affect paleontological resources. No indirect impacts would occur.

d) Disturb any human remains, including those interred outside of formal cemeteries?

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: As discussed in Item V.b, the presence of cultural resources, including human remains, is not anticipated due to the developed nature of the project site, but the potential to encounter unknown human remains during ground-disturbing activities exists. Therefore, impacts would be potentially significant. The project would implement SPEIR mitigation measure CULT-5 to reduce potential impacts to human remains to a less-than-significant level.

Direct Effects – Operations: Once constructed, the proposed project would be installed belowground. Operational maintenance activities would not involve substantial ground-disturbance and are not anticipated to disturb human remains. Impacts would be less than significant.

Indirect Effects: No indirect effects to human remains would occur.

e) Cause a substantial adverse change in the significance of a Tribal Cultural Resource as defined in Public Resources Code §21074?

Less Than Significant Impact.

Direct Effects – Construction and Operations: Refer to discussion provided in Item V.b.

Indirect Effects: Refer to discussion provided in Item V.b.

Mitigation

2017 CSMP SPEIR Mitigation Measures CULT-5: **Disturbance to Human Remains**. As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the person responsible for the excavation, or his or her authorized representative, shall immediately notify the San Diego County Coroner's office by telephone. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie adjacent remains (as determined by the Qualified Archaeologist and/or the traditionally and culturally affiliated [TCA] Native American Monitor) shall occur until the Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. If such a discovery occurs, a temporary construction exclusion zone shall be established surrounding the area of the discovery so that the area would be protected (as determined by the Qualified Archaeologist and/or the TCA Native American Monitor), and consultation and treatment could occur as prescribed by law. As further defined by State law, the Coroner would determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the NAHC within 24 hours. The NAHC would make a determination as to the Most Likely Descendent. If Native American remains are discovered, the remains shall be kept "*in situ*" ("in place"), or in a secure location in close proximity to where they were found, and the analysis of the remains shall only occur on site in the presence of the TCA Native American Monitor.

VI. GEOLOGY AND SOILS

GEOLOGY AND SOILS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	■	☐	☐
ii. Strong seismic ground shaking?	☐	☐	■	☐	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐	☐
iv. Landslides?	☐	☐	■	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	■	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	■	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	■	☐	☐

A Geotechnical Investigation Report was prepared for the project by Allied Geotechnical Engineers, Inc. (AGE; 2016; Appendix B). The results of the report are presented below.

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Less Than Significant Impact. There are no active faults within the city as listed under the Alquist-Priolo Earthquake Fault Zoning Act (City of Vista 2011). The faults that represent the most significant seismic hazard at the project site are the Elsinore Fault and Rose Canyon Fault, located approximately 16 miles to the northeast and 12 miles to the southwest of the project site, respectively. Because neither of these faults cross the project area, the potential for fault rupture is low (AGE 2016). Therefore, impacts relative to this issue would be less than significant.

ii. Strong seismic ground shaking?

Less Than Significant Impact. An earthquake along either the Elsinore Fault or Rose Canyon Fault could result in moderate to severe ground shaking at the project site (AGE 2016). Ground shaking would have the potential to affect the integrity of the proposed sewer pipeline and laterals; however, the project would be required to comply with soil stabilization/compaction requirements and standard engineering practices per seismic standards in the most recent version of the California Building Code, which has been incorporated into Title 16 of the City's Development Code. Furthermore, the project would implement recommendations from the project-specific Geotechnical Investigation Report (see Appendix B). Through compliance with the standard requirements and project-specific recommendations, impacts associated with exposure of structures to ground shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

No Impact. Seismically-induced soil liquefaction is a phenomenon is which loose to medium dense, saturated granular materials undergo rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground vibrations induced by earthquakes. The project site is underlain by very dense granite bedrock that is not susceptible to liquefaction (AGE 2016). Therefore, no impacts would occur relative to this issue.

iv. Landslides?

No Impact. Although the residential properties contain landscaped slopes, there are no steep slopes within or adjacent to the project site capable of producing a landslide. In addition, a review of geologic maps conducted as part of the project's Geotechnical Investigation Report indicated that landslides do not present a potential hazard to the project. Therefore, no impacts would occur relative to this issue.

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

Less Than Significant Impact. During the temporary construction period, trenching would expose soils to potential erosion; however, through compliance with the City's Grading and Erosion Control Ordinance, the project would not result in substantial erosion. Upon installation of the sewer pipeline and laterals, trenched areas within the roadways would be repaved, and the belowground facilities would not result in long-term operational erosion. Therefore, impacts relative to this issue would be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

No Impact. The project site is underlain by granite bedrock, which is generally not susceptible to landslide, lateral spreading, subsidence, liquefaction, or collapse (AGE 2016). Therefore, no impacts would occur relative to this issue.

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

No Impact. Based on visual observations and laboratory test results, the project-specific Geotechnical Investigation Report concluded that on-site soils are considered non-expansive (AGE 2016). Therefore, no impacts would occur relative to this issue.

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

No Impact. The project would construct sewer lines and laterals to existing residences. The project does not propose the use of septic tanks or alternative wastewater disposal systems. Therefore, no impacts would occur relative to this issue.

VII. GREENHOUSE GAS EMISSIONS

GREENHOUSE GAS EMISSIONS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	■	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	■	☐	☐

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

Less Than Significant Impact. In 2016, the City developed interim guidance for evaluating GHG emissions from individual development projects. The purpose of the *Interim Policy on Greenhouse Gas Emissions Significance Thresholds for CEQA* (City of Vista 2016) is to provide guidance for a consistent and objective evaluation of significant climate change impacts in compliance with Assembly Bill (AB) 32 until the CAP can be updated to include such evaluation criteria. The interim guidance identifies a numerical "Bright Line" threshold based on a review of projects within the city. It was determined that a

level of 1,185 metric tons (MT) of carbon dioxide equivalent (CO_2e) would capture 90 percent of the City's GHG emissions that are attributable to development projects. To determine if a project is making substantial progress towards meeting 2020 GHG emissions targets set forth in the CAP and AB 32, the total project GHG emissions in its first fully operational year must be less than the "Bright Line" threshold. If the project emissions are below the threshold, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

The project would abandon existing sewer lines and laterals and would reconnect existing residences to a new sewer line. Therefore, operation of the passive sewer pipeline and laterals would not lead to an increase in sewage requiring treatment and would therefore not increase GHG emissions. Occasional maintenance vehicle trips during operation of the project would generate GHG emissions; however, based on the minimal number of trips anticipated, GHG emissions would be negligible. Similarly, construction of the project would generate emissions through the operation of construction equipment, material delivery trucks, and worker commute vehicles; however, construction emissions would be temporary and minimal due to the relatively small size of the project.

The 2017 CSMP SPEIR analyzed a conservative scenario for annual GHG emissions that represents the most intensive year of construction activity, when all near-term capacity related improvements, up to 11,871 feet of pipeline installation, proposed under the CMSP are occurring simultaneously (not amortized); therefore, it can be assumed that GHG emissions from the proposed project would be less than this conservative estimate. The calculated annual GHG emissions from construction are estimated at 1,059 MT CO_2e, which is below the threshold of 1,185 MT CO_2e. Therefore, the proposed project would not exceed the threshold and would not generate GHG emissions that may have a significant impact on the environment. Impacts relative to this issue would be less than significant.

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

Less Than Significant Impact. Because the project would generate minimal GHG emissions that would be below the "Bright Line" threshold identified in the City's interim GHG guidelines, the project would be consistent with the City's interim GHG guidelines, AB 32, SB 32, the City's General Plan 2030 Update, and the City's CAP. Therefore, impacts relative to this issue would be less than significant.

VIII. HAZARDS AND HAZARDOUS MATERIALS

HAZARDS AND HAZARDOUS MATERIALS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐	☐

HAZARDS AND HAZARDOUS MATERIALS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) 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?	■	☐	☐	■	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	■	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	■	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	■	☐	☐
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	■	☐	☐
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	■	☐	☐	■	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	■	☐	☐

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.

Direct Effects – Construction: Project construction would involve limited use of toxic or hazardous substances that are typical for construction-related activities, such as oils, fuels for vehicles and construction equipment, hydraulic fluids, and solvents. The construction contractor would be required to use standard construction controls and safety procedures related to the transport, use, and disposal

of hazardous materials. Therefore, the project's use of typical construction-related hazardous materials would not create a significant hazard to the public, and impacts would be less than significant.

Direct Effects – Operations: Operation of the belowground passive sewer would not require the use of hazardous materials. Project operations would therefore not create a hazard to the public of the environment through the routine transport, use, or disposal of hazardous materials.

Indirect Effects: Short-term construction activities may involve the transport, use, and disposal of hazardous materials. These activities are unlikely to result in adverse, indirect effects to adjacent land uses, and impacts would be less than significant.

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?

SPEIR Mitigation Measure Applicable.

Direct Effects – Construction: Project construction would involve limited use of toxic or hazardous substances that are typical for construction-related activities, such as oils, fuels for vehicles and construction equipment, hydraulic fluids, and solvents. As such, there is potential for accidental releases (e.g., spilling of hydraulic fluids or diesel fuel from on-site construction equipment maintenance) during project construction. Such incidents, if they occur, would involve small volumes and low concentrations. In addition, the construction contractor would be required to use standard construction controls and safety procedures to avoid accident conditions and properly address accident conditions if they occur. Construction of the new sewer would involve excavation activities, which could encounter undocumented contaminated soils and/or groundwater. If such hazardous materials were encountered during excavation activities and if materials were improperly managed or disposed of, workers and the public could be exposed to hazardous substances. This is considered a significant impact. Therefore, 2017 CSMP SPEIR mitigation measure HAZ-1 would be implemented as part of the project to reduce potential impacts to a less-than-significant level.

Direct Effects – Operations: The proposed improvement, once constructed, would minimize the potential for pipeline leaks, ruptures, and/or sanitary overflow events that could create a significant hazard to the public or the environment. As a result, the project would entail desirable benefits and the impact is considered less than significant.

Indirect Effects: Potential indirect effects of implementing the proposed improvement would be associated with accidental release of hazardous materials during construction. Implementation of mitigation measure HAZ-1 would avoid indirect impacts.

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.

Direct Effects – Construction: The nearest school to the project site is Beaumont Elementary School, which is located approximately 0.4 mile east of the project site. Therefore, although the project would require the use of hazardous materials typical for construction, the project would not emit or handle hazardous materials within one-quarter mile of a school, and impacts would be less than significant.

Direct Effects – Operations: Operation of the belowground passive sewer would not require the use of hazardous materials. In addition, the proposed improvement, once constructed, would minimize the potential for pipeline leaks, ruptures, and/or sanitary overflow events near a school. As a result, the project would entail desirable benefits and the impact is considered less than significant.

Indirect Effects: No adverse, indirect impacts to schools have been identified.

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.

Direct Effects – Construction and Operations: The project site is not located on a site included on a list of hazardous material sites pursuant to Government Code Section 65962.5. There are no sites identified in the State Water Resources Control Board's (SWRCB) Geotracker database (SWRCB 2015) or the California Department of Toxic Substances Control's (DTSC) Envirostor database (DTSC 2019) within or adjacent to the project site. Therefore, no impacts would occur.

Indirect Effects: No adverse, indirect impacts associated with hazardous materials sites have been identified.

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

No Impact.

Direct Effects – Construction and Operations: The project site is not located within an airport influence area. The nearest airport to the project site is the McClellan-Palomar Airport, located over five miles to the southwest. At this distance, the project would not result in an airplane safety hazard for the temporary construction workers or occasional maintenance workers. Therefore, no impact would occur relative to this issue.

Indirect Effects: No adverse, indirect impacts to airports were identified.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. There are no private airstrips located in the vicinity of the project site. Therefore, no impact would occur relative to this issue.

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

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: Construction activities that would occur within Crescent Drive, Sabrina Way, and Avalon Drive would result in temporary reductions in usable roadway widths. Such reductions

could result in impaired emergency vehicle access; however, potential impacts would be reduced a less-than-significant level with incorporation of 2017 CSMP SPEIR mitigation measure TR-1, as applicable to the project. See Section XVI, Transportation and Traffic, of this Initial Study, for additional details regarding this measure.

Direct Effects – Operations: Once constructed, the proposed improvement would be located belowground and would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. No impact would occur.

Indirect Effects: Once operational, the proposed improvement would be belowground and would not interfere with emergency access and no indirect impact would result.

h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact.

Direct Effects – Construction and Operation: The project site is located in an urbanized area that is not mapped as a moderate, high, or very high fire hazard severity zone. In addition, aside from the temporary construction period, the belowground sewer pipeline and laterals would not expose people or structures to risk from wildfire. Therefore, no impacts would occur relative to this issue.

Indirect Effects: Once operational, the proposed improvement would be located belowground and would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Mitigation

2017 CSMP SPEIR Mitigation Measure HAZ-1: Halt Construction Work if Potentially Hazardous Materials are Encountered. All construction contractors shall immediately stop all surface or subsurface activities in the event that potentially hazardous materials are encountered, an odor is identified, or considerably stained soil is visible. Contractors shall follow all applicable local, state, and federal regulations regarding discovery, response, disposal, and remediation for hazardous materials encountered during the construction process. These requirements shall be included in the contractor specifications.

If any hazardous materials, waste sites, or vapor intrusion risks are identified prior to or during construction, a qualified professional, in consultation with appropriate regulatory agencies, will develop and implement a plan to remediate the contamination and properly dispose of the contaminated material.

If construction imports are proposed, the contractor shall furnish the City with appropriate documentation certifying that the imported materials are free of contamination.

IX. HYDROLOGY AND WATER QUALITY

HYDROLOGY AND WATER QUALITY: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Violate any water quality standards or waste discharge requirements?	☐	☐	■	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	■	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	■	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	■	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	■	☐	☐
f) Otherwise substantially degrade water quality?	☐	☐	■	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	■	☐	☐
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	■	☐	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	■	☐	☐

HYDROLOGY AND WATER QUALITY: Would the project:	Impact Analyzed in the SPEIR	New Significant Impact due to Unusual Circum-stances or Substantial New Information	No Impact or Less than Significant Impact	SPEIR Mitigation Measure(s) Applicable	New Mitigation Measure(s) Required
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	■	☐	☐

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant Impact.

Direct Effects – Construction: Project construction would involve trenching, pipe installation, and repaving, which could potentially result in the generation of water quality pollutants such as sediments, oils, fuels, hydraulic fluids, solvents, and paint. The project would be subject to requirements of the City's Stormwater Standards Manual, which establishes minimum stormwater management requirements and controls to address the highest priority water quality conditions in the Water Quality Improvement Plans for the San Luis Rey and Carlsbad Watershed Management Areas. The manual includes BMPs to reduce the amount of pollutants discharged to the City's municipal separate storm sewer system (MS4). Project construction would also be subject to the City's Grading and Erosion Control Ordinance. Compliance with applicable water quality standards and implementation of BMPs during construction would limit the project's pollutant discharge and the project would not violate water quality standards or waste discharge requirements. Therefore, direct construction impacts relative to this issue would be less than significant.

Direct Effects – Operations: Operational maintenance of the proposed sewer would occur through the proposed manholes and would not involve ground disturbance. Maintenance activities are therefore unlikely to contribute to water quality contamination. Unlike potable water pipelines, the proposed sewer would not involve periodic discharges to surface waters. As such, operation impacts related to violation of water quality standards would be less than significant.

Indirect Effects: The proposed improvement would replace an existing sewer line and would decrease the likelihood of leaks and associated water quality deterioration. As such, conditions would be improved, and no indirect impacts would occur.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant Impact.

Direct Effects – Construction: Project construction, which includes improvements to the City's sanitary sewer collection system, would not involve the use of groundwater. Dewatering of the construction area may be required; however, potential impacts to groundwater supplies would be temporary and would

be required to comply with the appropriate permits (National Pollution Discharge Elimination System No. CAG919003). Impacts would be less than significant.

Direct Effects – Operations: Operation of the sewer would not require the direct use of groundwater, and no impacts would occur.

Indirect Effects: Upon installation of the sewer pipeline and laterals, disturbed surfaces would be restored to existing conditions, and the project would not result in an increase in impervious surfaces. Therefore, the project would not deplete groundwater supplies or interfere with groundwater recharge, and no impacts would occur relative to this issue.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less Than Significant Impact.

Direct Effects – Construction: During the temporary construction period, trenching may alter the surface runoff drainage pattern of the project site. Through compliance with the City's Stormwater Standards Manual and Grading and Erosion Control Ordinance, the project would not result in substantial erosion or siltation on- or off-site. Therefore, construction impacts relative to this issue would be less than significant.

Direct Effects – Operations: Upon installation of the belowground sewer pipeline and laterals, the ground surface of the site would be restored to existing conditions, and impacts to drainage patterns would be less than significant.

Indirect Effects: The belowground sewer would not result in indirect effects to drainage patterns, and no impacts would occur.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less Than Significant Impact.

Direct Effects – Construction: Temporary project construction would not increase the rate or amount of surface runoff at the site, and would not result in flooding on- or off-site. Construction impacts would be less than significant.

Direct Effects – Operations: Upon installation of the sewer pipeline and laterals, the drainage pattern of the site would be restored to existing conditions, and the project would not result in an increase in impervious surfaces or surface runoff, and would not result in flooding on- or off-site. Operational impacts would be less than significant.

Indirect Effects: The belowground sewer would not result in indirect effects to drainage patterns, and no impacts would occur.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant Impact.

Direct Effects – Construction: Refer to the discussion provided in Item IX.a.

Direct Effects – Operations: One of the primary functions of the sanitary sewer system is to protect public health and the environment through the collection, treatment, and proper disposal of wastewater. The proposed improvement would contribute to this goal. In addition, upon installation of the sewer pipeline and laterals, the drainage pattern of the site would be restored to existing conditions, and the project would not result in an increase in impervious surfaces or surface runoff. Therefore, the project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. No impacts would occur relative to this issue.

Indirect Effects: The proposed improvement would replace an existing sewer line and would decrease the likelihood of leaks and associated water quality deterioration. As such, conditions would be improved, and no indirect impacts would occur.

f) Otherwise substantially degrade water quality?

Less Than Significant Impact.

Direct Effects – Construction: Refer to the discussion provided in Item IX.a.

Direct Effects – Operations: Refer to the discussion provided in Item IX.a.

Indirect Effects: Refer to the discussion provided in Item IX.a.

g) Place housing within a 100-year flood hazard area as mapped on a federal flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact.

Direct Effects – Construction and Operations: The proposed project does not include housing. No direct impacts would occur relative to this issue.

Indirect Effects: The proposed improvement would serve existing residences and would not generate the construction of additional housing that would be placed within a 100-year flood hazard area. No indirect impacts would occur.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No Impact.

Direct Effects – Construction and Operations: The proposed project does not include aboveground structures that would impede or redirect flood flows. No direct impacts would occur relative to this issue.

Indirect Effects: The proposed project would not result in subsequent development of structures that would be placed in a 100-year flood hazard area. No indirect impacts would occur.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact.

Direct Effects – Construction and Operation: Dam failure can occur due to an earthquake, erosion, design flaw, or water overflow during storms. Failure of Maerkle Dam (also known as Squires Dam), which is located approximately 3.3 miles southwest of the project site in the city of Carlsbad, could result in inundation of properties located adjacent to Agua Hedionda Creek and Buena Creek within the southern portion of the city (City of Vista 2011). Because the project site is not within such areas, it would not be subject to flooding as a result of dam failure. Therefore, no direct impacts would occur relative to this issue.

Indirect Effects: The proposed improvement would serve existing residences and would not generate the construction of additional housing or structures that would be placed within a dam inundation area. No indirect impacts would occur.

j) Inundation by seiche, tsunami, or mudflow?

No Impact.

Direct Effects – Construction and Operations: Based on distance to the Pacific Ocean (over seven miles), absence of water bodies capable of producing a seiche, and lack of steep slopes in the vicinity of the project site, the project would not be subject to inundation by tsunami, seiche, or mudflow. No direct impacts would occur relative to this issue.

Indirect Effects: The proposed improvement would serve existing residences and would not generate the construction of additional housing or structures that would be placed within an area subject to inundation by seiche, tsunami, or mudflow. No indirect impacts would occur.

X. LAND USE AND PLANNING

LAND USE AND PLANNING: Would the project:	Impact Analyzed in the SPEIR	New Significant Impact due to Unusual Circum-stances or Substantial New Information	No Impact or Less than Significant Impact	SPEIR Mitigation Measure(s) Applicable	New Mitigation Measure(s) Required
a) Physically divide an established community?	■	☐	☐	■	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	■	☐	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	■	☐	☐

a) Physically divide an established community?

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: A project could result in impacts to the physical division of an established community if new or widened roads would traverse an established community; if new development would block existing connections within an established community; if redevelopment would disrupt the physical arrangement of an existing community by shifting existing development from one land use to another; if the project would impact existing street and sidewalk patterns; or if the project would preclude development of surrounding parcels.

Construction of the proposed sewer pipeline would require trenching within Crescent Drive, Avalon Drive, and Sabrina Way, adjacent to existing residences within an established community. While such construction activities would not physically divide an established community, it would result in temporary disturbances to existing residents; however, access to and from the affected residences would be maintained through implementation of a Traffic Control Plan, as required under 2017 CSMP SPEIR Mitigation Measure TR-1 (refer to Section XVI). In addition, impacts would be limited to the temporary construction period. As such, impacts are considered less than significant.

Direct Effects – Operations: Upon completion of construction activity, the proposed sewer pipeline and laterals would be below ground and would not physically divide an established community. No direct operational impacts would occur relative to this issue.

Indirect Effects: Implementation of the proposed project would not induce growth or result in subsequent development or effects that could result in the division of an established community. No impact would result.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact.

Direct Effects – Construction: Land uses adjacent to the proposed project include single-family residential uses. Construction would occur primarily within the roadways adjacent to the residences and could temporarily disrupt local circulation and neighborhood access. Potential impacts to adjacent land uses from the project's construction-related activities could include traffic delays and/or safety hazards, risks associated with the release of hazardous materials, and increased noise. Such impacts are discussed in various sections of this addendum.

The proposed project would be consistent with the City's General Plan in that the plan does not preclude construction of new or updated sewer facilities. Furthermore, the proposed project would serve the existing residential land uses and would reduce the potential environmental harm that could be caused by failure of the existing facilities. For these reasons, project construction would not conflict with plans or policies of an agency with jurisdiction of the project adopted for the purpose of avoiding or mitigating for adverse environmental effects, and impacts would be less than significant.

Direct Effects – Operations: The proposed project would serve an existing population and would therefore be consistent with the adopted land uses defined in the City's General Plan 2030 Update. The project would also not conflict the goals and policies of the Public Safety, Facilities, and Services Element of the City's General Plan 2030 Update as the project would be consistent with the stated goal (Goal PSFS 9) of providing sanitary sewer facilities to accommodate the safe, efficient, and cost-effective disposal of waste, commensurate with existing and proposed development.

As discussed in Item VII.a, the City adopted a CAP in 2013 to reduce GHG emissions in accordance with AB 32. The City later adopted interim guidance for evaluating discretionary projects under CEQA in compliance with AB 32 in 2016. The proposed project was analyzed against the numerical "Bright Line" significance threshold established in the interim guidance to determine the project's contribution towards achieving the goals of AB 52. As discussed in Item VII.a, the proposed project would not exceed the threshold and would not generate GHG emissions that may have a significant impact on the environment. Therefore, the project would not conflict with the interim guidance or the CAP.

Upon installation of the sewer pipeline and laterals, the project site would be restored to existing conditions and would not represent or cause a change in land use. Impacts relative to this issue would be less than significant.

Indirect Effects: The proposed project would not facilitate or encourage new, unplanned development or a change in existing or planned land uses. Therefore, no indirect impacts would occur from the project.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact.

Direct Effects – Construction and Operation: The City is a participating entity in the North County MHCP. The MHCP is a comprehensive, multi-jurisdictional planning program designed to develop an ecosystem preserve in the northwestern part of the County. Due to the developed nature of the project site and surrounding areas and lack of sensitive biological resources at the site, the project would not conflict with provisions of the MHCP. No impacts would occur relative to this issue.

Indirect Effects: The project would not facilitate or encourage new, unplanned growth or a change in existing or planned land use which could conflict with the MHCP. Therefore, no indirect impacts would occur from the project.

XI. MINERAL RESOURCES

MINERAL RESOURCES: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	■	☐	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	■	☐	☐

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

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

No Impact. The project site is located within a fully urbanized area of the city and is surrounded by residential uses. The new sewer pipeline and laterals would be located under paved roadways and within residential properties. These areas are not designated for mineral extraction and are currently not available for mineral extraction. Therefore, the project would not result in the loss of availability of a mineral resource, and no impacts would occur.

XII. NOISE

NOISE: Would the project:	Impact Analyzed in the SPEIR	New Significant Impact due to Unusual Circum-stances or Substantial New Information	No Impact or Less than Significant Impact	SPEIR Mitigation Measure(s) Applicable	New Mitigation Measure(s) Required
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	■	☐	☐	■	☐
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	■	☐	☐
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	■	☐	☐
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	■	☐	☐	■	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	■	☐	☐
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	■	☐	☐

A Noise Technical Report was prepared for the project by HELIX Environmental Planning, Inc. (HELIX 2020; Appendix C). The results of the report are presented below.

Fundamentals of Sound and Environmental Noise

Noise can be defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Sound intensity or acoustic energy is measured in decibels that are A-weighted (indicated by dBA) to correct for the relative frequency response of the human ear.

Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. Typically, a doubling of sound volume will increase a noise level by 3 dBA. A 3-dBA change in sound is the level where humans generally notice a barely perceptible change in sound, and a 5-dBA change is generally readily perceptible. The predominant rating scale for analyzing construction

noise is the equivalent sound level (L_{EQ}), which is based on dBA. The L_{EQ} represents the sound pressure level equivalent to the total sound energy over a given period of time (e.g., duration of one hour).

Sensitive Noise and Vibration Receptors

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors are individual locations that may be affected by noise. NSLUs in the project vicinity are single-family residences immediately adjacent the project alignment.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2006) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Vibration-sensitive land uses in the project area include the adjacent single-family residences.

Regulatory Framework

Chapter 8.32, *Noise Control,* of the City's Municipal Code limits a project's operational noise generation at a common property line with a residential zone to 50 dBA L_{EQ} (1-hour) between 7:00 a.m. and 10:00 p.m. and 45 dBA L_{EQ} (1-hour) between 10:00 p.m. and 7:00 a.m. Construction activities are not allowed to generate noise in excess of 75 dBA L_{EQ} (8-hour) at residences or occur between the hours of 7:00 p.m. and 7:00 a.m. of the next day, on Sundays, or on a holiday.

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: Project construction would generate noise through trenching, pipe installation, backfilling, and repaving activities. It is assumed that trenching, pipeline installation, backfilling, and other ground restoration activities within the private properties would be conducted with hand tools and would not require heavy motorized equipment. The loudest activities associated with pipeline construction would be from a concrete saw cutting existing roadway pavement and from a backhoe digging the trench for the new pipeline. Both activities would occur as close as 30 feet to adjacent residential properties but would not operate simultaneously at a given location. Furthermore, based on a typical work rate of 20 feet per hour for a concrete saw and backhoe along a linear alignment, construction equipment would not be located within 30 feet from a given residence for more than 3.5 hours over the course of an 8-hour workday. For this analysis it is assumed that equipment would operate at an average distance of 50 feet from a given residence over the course of an 8-hour workday. At a distance of 50 feet, a concrete saw would generate a noise level of 82.6 dBA L_{EQ} and a backhoe would generate a noise level of 73.6 dBA L_{EQ} (U.S. Department of Transportation 2008). Use of a backhoe would be in compliance with the applicable noise limit; however, use of a concrete saw for activities within 120 feet of residences would generate noise levels at adjacent residences in excess of the 75 dBA L_{EQ} noise limit. The project would include the use of a temporary moveable 6-foot noise barrier between the concrete saw and residences for the duration that the concrete saw is within 120

feet of residences. The temporary barriers used would be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks would be filled or caulked. If wood is used, it would be tongue and groove or close butted seams and would be at least 3/4 inch thick or have a surface density of at least 3.5 pounds per square foot. Impacts from construction equipment would therefore be less than significant. Additionally, mitigation measure NV-1 of the SPEIR would help to minimize construction noise. Impacts from construction equipment would be less than significant.

Project construction would generate vehicle trips associated with material delivery and worker commutes. Due to the limited number of trips and low speeds posted on the residential streets, however, noise generated from construction-related vehicles would be minimal and impacts would be less than significant.

Direct Effects – Operations: Operational noise from the project would be associated with periodic maintenance. The noise generated by on-site maintenance and associated vehicle trips would be infrequent and of short duration, and would not be substantially different from existing maintenance and repair activities. In addition, the new sewer line would be located further from the residences on Crescent Drive than where it is currently located, and noise levels associated with operational maintenance activities would likely be reduced at these residential receivers. As such, noise generated by on-site maintenance activities is not anticipated to exceed noise limits for residential properties established in the City's Noise Ordinance and would not expose sensitive receptors to excessive noise. Impacts would be less than significant.

Indirect Effects – The proposed project would not result in future growth that could increase noise levels. No indirect noise impacts would occur.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact.

Direct Effects – Construction: Construction activities known to generate excessive ground-borne vibration include pile driving and the use of a vibratory roller for soil compaction. A vibratory roller can generate ground-borne vibration levels of 0.210 inches per second (in/sec) peak particle velocity (PPV) at a distance of 25 feet (Caltrans 2013). Pile driving would not be required for the project and a vibratory roller would not be used due to trench size constraints. A small vibratory plate compactor or tamping rammer would likely be used. These are handheld units and would have no measurable vibration beyond 10 to 15 feet. Other construction equipment to be used would generate substantially less ground-borne vibration than a vibratory roller; therefore, equipment to be used for project construction would not generate ground-borne vibration levels of 0.2 in/sec PPV or greater at the adjacent residences. Impacts would be less than significant.

Direct Effects – Operations: Operation of the sewer pipeline and laterals would not generate vibration. Impacts relative to this issue would be less than significant.

Indirect Effects – The proposed project would not result in secondary activities that could generate substantial ground-borne vibration levels. No indirect vibration impacts would occur.

c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. Refer to Section XII.a. Noise generated by the project's occasional operational maintenance activities would not generate noise levels in excess of noise limits for residential properties set forth in the City's Noise Ordinance, and impacts would be less than significant.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

SPEIR Mitigation Measures Applicable. Refer to XII.a, above. Project construction may generate noise levels in excess of standards set forth in the City's Noise Ordinance. Mitigation measure NV-1 of the SPEIR would help to minimize construction noise. Additionally, the project would incorporate a temporary and moveable 6-foot noise barrier between any concrete saws and nearby residences, if conducted within 120 feet of residences.

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

No Impact. The project is subject to some distant aircraft noise, though the site is not located near an active airport. The nearest airports are McClellan-Palomar Airport, located five miles to the southwest, Oceanside Municipal Airport, located seven miles to the west, and Marine Corps Air Station Camp Pendleton, located 10 miles to the northwest. At these distances, no impacts related to airport noise would occur at the project site.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. There are no private airstrips located in the vicinity of the project site. Therefore, no impact would occur relative to this issue.

Mitigation

2017 CSMP SPEIR Mitigation Measure NV-1: Construction Noise Reduction Measures. The Construction Contractor shall demonstrate to the satisfaction of the City Engineer that the following noise control techniques are implemented during the clearing, demolition, grading and construction phases of projects identified in the 2017 CSMP within 200 feet of noise-sensitive land uses.

- Heavy equipment repair and contractor staging shall be conducted at sites as far as practical from nearby residences.

- Construction equipment, including vehicles, generator and compressors, shall be maintained in proper operating condition and shall be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, acoustical lagging, and/or engine enclosures).

- Temporary sound barriers (or curtains), stockpiles or excavated materials, or other effective shielding or enclosure techniques shall be used where construction noise would exceed 90 dBA within less than 50 feet from a noise sensitive receptor.

- Construction work, including on-site equipment maintenance and repair, shall be limited to the hours specified in the noise ordinance of the affected jurisdiction(s).

- Electrical power shall be supplied from commercial power supply, wherever feasible, in order to avoid or minimize the use of engine-driven generators.

- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible.

- Unnecessary idling of internal combustion engines (i.e., in excess of five minutes) shall be prohibited.

- Operating equipment shall be designed to comply with all applicable local, state, and federal noise regulations.

- Construction site and access road speed limits shall be established and enforced during the construction period.

- If lighted traffic control devices are to be located with 500 feet of residences, the devices shall be powered by batteries, solar power, or similar sources, and not be an internal combustion engine.

- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

- No project-related public address or music system shall be audible at any adjacent sensitive receptor.

- The construction contractors shall provide advance notice, between 2 and 4 weeks prior to construction, by mail to all residents or property owners within 200 feet of the alignment. The announcement shall state specifically where and when construction will occur in the area. If construction delays or more than seven days occur, an additional notice shall be made, either in person or by mail. The City shall publish a notice of impending construction on the City website, stating when and where construction will occur.

- The construction contractors shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise and other construction disturbance. The construction contractors shall also establish a program for receiving questions or complaints during construction and develop procedures for responding to callers. Procedures for reaching the public liaison officer via telephone or in person shall be included in notices distributed to the public in accordance with the information above.

XIII. POPULATION AND HOUSING

POPULATION AND HOUSING: Would the project:	Impact Analyzed in the SPEIR	New Significant Impact due to Unusual Circum-stances or Substantial New Information	No Impact or Less than Significant Impact	SPEIR Mitigation Measure(s) Applicable	New Mitigation Measure(s) Required
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	■	☐	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	■	☐	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	■	☐	☐

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

No Impact. The project involves the installation of a new sewer pipeline and laterals to replace existing pipelines. The new facilities would serve the same population as the existing facilities and would not induce population growth either directly or indirectly. No impacts would occur relative to this issue.

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

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Less Than Significant Impact. Although portions of the proposed project would occur within residential properties, the project would not displace the houses or residences occupying these properties. Project-related work done within the residential properties would be to install sewer laterals that would serve the residences. Therefore, impacts relative to these issues would be less than significant.

XIV. PUBLIC SERVICES

PUBLIC SERVICES: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
a) Fire protection?	☐	☐	■	☐	☐
b) Police protection?	☐	☐	■	☐	☐
c) Schools?	☐	☐	■	☐	☐
d) Parks?	☐	☐	■	☐	☐
e) Other public facilities?	☐	☐	■	☐	☐

a) Fire protection?
b) Police protection?
c) Schools?
d) Parks?
e) Other public facilities?

No Impact. The proposed project would not involve development that would generate an increase in population and would therefore not result in an increase in demand for public services and facilities; no impacts would occur relative to this issue.

XV. RECREATION

RECREATION: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	■	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	■	☐	☐

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

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

No Impact. The proposed project would not involve development that would generate an increase in population and would therefore not result in an increase in demand for parks or other recreational facilities; no impacts would occur to such facilities.

XVI. TRANSPORTATION AND CIRCULATION

TRANSPORTATION AND TRAFFIC: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	■	☐	☐	■	☐

TRANSPORTATION AND TRAFFIC: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	■	☐	☐	■	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	■	☐	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	■	☐	■	■	☐
e) Result in inadequate emergency access?	■	☐	☐	■	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	■	☐	☐

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: Construction-related activities associated with the proposed project could result in a temporary decrease in the level of service capacity of Crescent Drive, Avalon Drive, and Sabrina Way due to trenching and pipe installation work that would require partial street closures. While these roadways are not high-traffic roadways, construction activities would cause temporary disruption of access to residences along the construction route. 2017 CSMP SPEIR Mitigation Measure TR-1 would be implemented to address temporary, construction-related impacts to the circulation network through the preparation of a project-specific Traffic Control Plan.

During construction activities, traffic would be generated from haul truck trips to and from the work area and commute trips for the work crew. The 2017 CSMP SPEIR analyzed a construction scenario that would involve two construction crews of 15 persons each generating up to 60 personal commute round trips per day, as well as up to 10 daily haul trucks trips to accommodate the delivery of construction materials and equipment and soil import/export. The SPEIR found that this number of daily trips would not result in significant impacts to roadway operations or capacity. Furthermore, it is likely that the proposed project, due to its relatively small size, would generate fewer trips that what was analyzed in the SPEIR. Therefore, traffic impacts during the temporary construction period would be less than significant.

Direct Effects – Operations: Upon installation of the belowground sewer pipeline and laterals, roadways affected by trenching activities would be restored to existing conditions. Therefore, the project would not permanently affect the circulation system and would not conflict with an applicable congestion management program, or plan, ordinance, or policy related to the performance of the circulation system. Impacts relative to this issue would be less than significant.

Indirect Effects: Roadways that would be affected by construction activities, including Crescent Drive, Avalon Drive, and Sabrina Way, are not high-traffic roadways; therefore, it is not anticipated that a substantial amount of traffic would redistributed along other roadways in the area that could decrease the level of service of capacity of additional roadways and/or intersections. As such, indirect impacts would be less than significant.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The project does not include structures that would change air traffic patterns or uses that would generate air traffic. Therefore, no impacts related to a change in air traffic patterns would occur.

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

SPEIR Mitigation Measure Applicable.

Direct Effects – Construction: Trenching and pipe installation activities, and associated lane closures, with the rights-of-way (ROW) of Crescent Drive, Avalon Drive, Sabrina Way could disrupt traffic flows and street operations and affect visibility from adjacent residential driveways. To minimize safety hazards, 2017 CSMP SPEIR Mitigation Measure TR-1 would be implemented to reduce this impact to a less-than-significant level.

Direct Effects – Operations: The proposed project would not include permanent design features or incompatible uses that would affect traffic safety. Following construction, the pipeline would be located belowground, and would not increase hazards to roadway users. Therefore, substantial hazards would not occur, and impacts would be less than significant.

Indirect Effects: The proposed project would not include the installation of roadway design features or incompatible uses that could result in permanent, indirect safety hazards; however, construction of the project within public ROWs could increase the interaction of construction-related traffic, vehicles, and pedestrians, thus temporarily increasing the potential safety hazards and restricting or delaying access

to adjacent land uses. 2017 CSMP SPEIR would be implemented and would minimize potential indirect effects associated with roadway hazards during the temporary construction period.

e) Result in inadequate emergency access?

SPEIR Mitigation Measures Applicable.

Direct Effects – Construction: Construction activities that would occur within Crescent Drive, Sabrina Way, and Avalon Drive would result in temporary reductions in usable roadway widths. Such reductions could result in impaired emergency vehicle access; however, such potential impacts would be reduced a less-than-significant level with incorporation of 2017 CSMP SPEIR mitigation measure TR-1.

Direct Effects – Operations: Following construction, the pipeline would be located belowground, and would not affect emergency access. Therefore, substantial hazards would not occur, and impacts would be less than significant.

Indirect Effects: Following construction, the pipeline would be located belowground, and would not affect emergency access. No indirect impacts would result.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less Than Significant Impact.

Direct Effects – Construction: The North County Transit District (NCTD) BREEZE bus route 334 is the closest public transit option to the project site with stops at various points along Eucalyptus Avenue, the closest of which is located at the intersection of Crescent Drive and Eucalyptus Avenue, approximately 0.3 mile east of the project site. Construction of the proposed project would not interfere with BREEZE bus services. There are no designated bicycle lanes along the roadways within which the project construction would occur. Sidewalks located along the south side of Crescent Drive and on both sides of Sabrina Way would remain accessible during construction. Impacts would be less than significant.

Direct Effects – Operations: Following construction, the belowground pipeline and laterals would not affect the performance or safety of public transit, bicycle, or pedestrian facilities. Therefore, impacts relative to this issue would be less than significant**.**

Indirect Effects: The proposed project would not result in indirect impacts to alternative modes of transportation.

Mitigation

2017 CSMP SPEIR Mitigation Measure TR-1: Prepare and Implement a Traffic Control Plan. The construction contractor shall prepare a Traffic Control Plan for roadways and intersections affected by the proposed project for approval by the City Engineer. The Traffic Control Plan shall include, but not be limited to, the following elements based on local site and roadway conditions:

- Provide street layout showing location of construction activity and surrounding streets to be used as detour routes, including “special signage.” Post a minimum 72-hour advance warning of construction activities within affected roadways to allow motorists to select alternative routes.

- Restrict delivery of construction materials to non-peak travel periods (9:00 a.m. – 3:00 p.m.) as appropriate. Weekend and night work shifts will be allowed in non-residential areas only.

- Maintain the maximum travel-lane capacity during non-construction periods and provide flagger-control at construction sites to manage traffic control and flows.

- Limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone.

- Maintain access for driveways and private roads, except for brief periods of construction, in which case property owners will be notified.

- Require temporary steel-plate trench crossings, as needed, to maintain reasonable access to homes, businesses, and streets. When required by the applicable encroachment permit, maintain the existing lane configuration during nonworking hours by covering the trench with steel plates or by using temporary backfill.

- Require appropriate warning signage and safety lighting for construction zones.

- Access for emergency vehicles shall be maintained at all times. Police, fire, and emergency services shall be notified of the timing, location, and duration of construction activities that could hinder and/or delay emergency access through the construction period.

- Identify detours, where available, for bicyclists and pedestrians in areas potentially affected by project construction.

- Provide adequate off-street parking locations for workers' vehicles and construction equipment in those areas where on-street parking availability is insufficient.

- Repair and restore the roadway ROW to its original conditions or better upon completion of work.

XVII. UTILITIES AND SERVICE SYSTEMS

UTILITIES AND SERVICE SYSTEMS: Would the project:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	■	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	■	☐	☐
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	■	☐	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	■	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	■	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	■	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	■	☐	☐

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less Than Significant Impact. The project involves the installation of a new sewer pipeline and laterals to replace existing pipelines. The new facilities would serve the same population as the existing facilities and would therefore not result in an increase in wastewater in a manner that would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. In addition, the proposed project would contribute to the goals included in the 2017 CSMP SPEIR, which are to reduce the potential for sewer overflows, implement capacity improvements, where required, and restore, maintain, and/or enhance existing sewer service consistent with the City's adopted Sewer System Management Plan (City of Vista 2014). Impacts relative to this issue would be less than significant.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. The project involves the installation of a new sewer pipeline and laterals to replace existing pipelines. The new facilities would serve the same population as the existing facilities and would therefore not result in an increase in wastewater in a manner that would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. Wastewater associated with the proposed sewer pipeline and laterals would be conveyed to the Encina Wastewater Authority's Water Pollution Control Facility, which, as determined in the 2017 CSMP SPEIR, has adequate capacity to accommodate existing and project flows. As such, impacts relative to this issue would be less than significant.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The project would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. Upon installation of the pipeline and laterals, the project site would be restored to existing conditions and would not generate an increase in stormwater which would require new drainage facilities. No impact relative to this issue would occur.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

No Impact. The proposed project would not require water supplies; therefore, no impact would occur relative to this issue.

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

Less Than Significant Impact. See Section XVIII.a. The project involves the installation of a new sewer pipeline and laterals to replace existing pipelines. The new facilities would serve the same population as the existing facilities and would therefore not result in an increase in wastewater in a manner that would increase wastewater treatment demand. Therefore, impacts relative to this issue would be less than significant.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Less Than Significant Impact. Solid waste generated in the City is transported to Sycamore Landfill, which has a maximum permitted throughput of 5,000 tons of waste per day and a remaining capacity of 113,972,637 cubic yards (California Department of Resources Recycling and Recovery 2019). Project construction may generate a minor amount of solid waste during construction (such as removed asphalt and soil) but the amount would not exceed the permitted capacity of Sycamore Landfill. The project would comply with federal, state, and local statutes and regulations related to solid waste, and impacts would be less than significant.

XVIII. MANDATORY FINDINGS

MANDATORY FINDINGS Environmental Issue Area:	**Impact Analyzed in the SPEIR**	**New Significant Impact due to Unusual Circum-stances or Substantial New Information**	**No Impact or Less than Significant Impact**	**SPEIR Mitigation Measure(s) Applicable**	**New Mitigation Measure(s) Required**
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	■	☐	☐	■	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects)?	☐	☐	■	☐	☐
c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?	■	☐	☐	■	☐

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

SPEIR Mitigation Measures Applicable. Due to the developed nature of the project site and surrounding area, and the subsequent lack of biological resources within and adjacent to the project site, the project would have low potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining level, threaten to eliminate a plant or animal community, or restrict the range of a rare or endangered plant or animal. The project would implement 2017 CSMP SPEIR Mitigation Measure BIO-1 to avoid potential impacts that may occur to breeding birds protected under the MBTA and that may nest is nearby ornamental trees during construction activities. Similarly, based on the lack of historical and archaeological resources at the project site, the project would not eliminate important examples of the major period of California history or prehistory. Through implementation of the above-mentioned mitigation measure, impacts relative to this issue would be less than significant.

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

Less Than Significant Impact. Based on the existing extent of residential development in the vicinity of the proposed project, additional development projects are not anticipated to occur near the proposed project. Projects that would occur in the general vicinity include other projects proposed under the 2017 CSMP. Based on its relatively small size, short-term construction period, and lack of operational impacts, the proposed project is not anticipated to contribute impacts that are cumulatively considerable when viewed in connection with these other projects. In addition, the proposed project and projects included under the 2017 CSMP would implement mitigation measures from the 2017 CSMP SPEIR, as applicable, to minimize impacts. Therefore, impacts relative to this issue would be less than significant.

c) Have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?

SPEIR Mitigation Measures Applicable. Impacts associated with the release of hazardous materials, impairment of emergency access, and generation of noise during the temporary construction period would have the potential to cause substantial adverse effects on human beings; however, through compliance with standard regulations and implementation of the mitigation measures identified in this document and in the 2017 CSMP SPEIR, impacts would be less than significant. Specifically, in addition to standard construction controls and safety procedures during construction that would minimize risk associated with exposure to hazardous materials such as oils, fuels, hydraulic fluids, and solvents that would be used during construction, the project would implement 2017 CSMP SPEIR Mitigation Measure HAZ-1 to reduce potential impacts associated with undocumented contaminated soils and/or groundwater that may be encountered during the project's excavation activities. Implementation of 2017 CSMP SPEIR mitigation measure TR-1 would allow for sufficient emergency access when construction would occur within roadways. Implementation of 2017 CSMP SPEIR mitigation measure NV-1 would reduce noise levels at affected residences to within limits set by the City's noise ordinance. Therefore, with the inclusion of these mitigation measures, the project would not have environmental effects which would cause substantial adverse effects on human being, and impacts would be less than significant.

3.0 REFERENCES

Allied Geotechnical Engineers, Inc. 2016. Report of Geotechnical Investigation, Crescent Drive Sewer Improvements (CIP), City of Vista. October 24.

California Department of Conservation. 2016. California Important Farmland Finder. Available from: https://maps.conservation.ca.gov/DLRP/CIFF/.

California Department of Toxic Substances Control (DTSC). 2019. Envirostor Database. Available from: https://www.envirostor.dtsc.ca.gov/public/.

California Department of Resources Recycling and Recovery. 2019. Solid Waste Information System Facility Detail: Sycamore Landfill (37-AA-0023).

California Department of Transportation (Caltrans). 2018. Scenic Highways. August 2. Available from: http://www.dot.ca.gov/design/lap/livability/scenic-highways/index.html.

2013 Transportation and Construction Vibration Guidance Manual, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September.

HELIX Environmental Planning, Inc. (HELIX). 2019. Crescent Drive Sewer Improvements Project – Project-Specific Archaeological Survey Report. December.

2020 Crescent Drive Sewer Improvements Project – Noise Technical Report. January.

Marben-Laird Associates. 1987. *Historic Resource Survey, A Project of the City of Vista, California.* Report submitted to City of Vista. Report on file at South Coastal Information Center, San Diego State University.

San Diego Air Pollution Control District. 2015. Monitoring and Technical Services Division. 5-Year Air Quality Monitoring Network Assessment. July.

State Water Resources Control Board (SWRCB). 2015. Geotracker Database. Available from: http://geotracker.waterboards.ca.gov/.

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

Vista, City of

2017 Supplemental Program Environmental Impact Report for Comprehensive Sewer Master Plan Update (SCH #2007091072. October.

2017 Comprehensive Sewer Master Plan Update. August.

2016 Memorandum: Interim Policy on Greenhouse Gas Emissions Significance Thresholds for CEQA Compliance in accordance with CA Supreme Court Ruling in *Center for Biological Diversity v. California Department of Fish and Wildlife*. March 17.

Vista, City of (cont.)

2011 Vista General Plan 2030. December.

2009 City of Vista and Buena Sanitation District Sewer System Management Plan. Revised March 2014 and May 2019.

2008 2007 Program Environmental Impact Report for the City of Vista 2007 Sewer Master Plan Update (SCH# 2007091072). March.

4.0 LIST OF PREPARERS

City of Vista

Elmer Alex	Principal Engineer
Alfred Pedroza	Senior Engineer

HELIX Environmental Planning, Inc.

Jason Runyan	Project Manager
Hunter Stapp	Environmental Planner
Joanne Dramko, AICP	Principal-in-Charge, Quality Assurance Reviewer

This page intentionally left blank

Appendix A

Project-Specific Archaeological Survey Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 tel
619.462.0552 fax
www.**helixepi**.com

December 6, 2019 KEH-01

Ms. Nita Kazi, PE, Senior Engineer
KEH and Associates, Inc.
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Subject: Crescent Drive Sewer Improvements Project – Project-Specific Archaeological Survey Report

Dear Ms. Kazi:

HELIX Environmental Planning, Inc. (HELIX) was contracted to conduct a cultural resources survey for the Crescent Drive Sewer Project (project) located in the City of Vista (City). The project is a condition-related project in the 2017 Comprehensive Sewer Master Plan (CSMP) Final Supplemental Program Environmental Impact Report (SPEIR; City of Vista 2017) that was certified in October 2017. This letter report details the methods and results of the project-specific archaeological survey, which included a records search, Sacred Lands File search, Native American outreach, a review of historic maps and aerial photographs, a field survey, and this letter report.

PROJECT DESCRIPTION AND LOCATION

The project site is located in the City of Vista in northern San Diego County (Figure 1, *Regional Location*). The project is located north of State Route (SR) 78 within the Buena Vista Land Grant, in Section 19 of Township 11 South, Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute San Marcos quadrangle (Figure 2, *USGS Topography*). The project area is situated within the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties (Figure 3, *Project Aerial Photograph*).

The project proposes to conduct sewer improvements to the sewer main and connecting sewer laterals. The project consists of abandoning 450 feet of existing 6-inch vitrified clay pipe (VCP) sewer and installing 712 feet of new 8-inch polyvinylchloride (PVC) pipe within the public rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way. The existing VCP sewer is located in an easement that runs along the northern portions of multiple private properties on Crescent Drive, which presents maintenance challenges and creates substantial disturbance for the residents located along the sewer alignment. The project would require the installation and connection of 11 new 4-inch sewer laterals from private properties to the new sewer pipeline.

Project construction would involve trenching, installing the new pipeline, backfilling, and repaving affected portions of the streets and private properties. Construction activities would occur in the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties. All existing landscaping and hardscape that conflicts with the installation or proper function of the proposed improvements would be removed, replaced, and/or relocated upon installation of the proposed sewer main and laterals.

REGULATORY FRAMEWORK

The California Environmental Quality Act (CEQA) Guidelines (§15064.5) address determining the significance of impacts to archaeological and historic resources. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance (Office of Historic Preservation [OHP] 1995). Significant resources are designated as "historical resources," and are defined per Public Resources Code 21084.1 and CEQA Guidelines, California Code of Regulations (CCR) Title 14 Section 15064.5 as follows:

- resource(s) listed or determined eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR) (14 CCR Section 15064.5[a][1])

- resource(s) either listed in the National Register of Historic Places (NRHP) or in a "local register of historical resources" or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless "the preponderance of evidence demonstrates that it is not historically or culturally significant" (14 CCR Section 15064.5[a][2])

- resources determined by the Lead Agency to meet the criteria for listing on the CRHR (14 CCR Section 15064.5[a][3])

For listing in the CRHR, a historical resource must be significant at the local, state, or national level under one or more of the following four criteria:

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

B. It is associated with the lives of persons important to local, California, or national history;

C. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values;

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

Under 14 CCR Section 15064.5(a)(4), a resource may also be considered a "historical resource" for the purposes of CEQA at the discretion of the lead agency.

All resources that are eligible for listing in the CRHR must have integrity, which is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the

resource's period of significance. Resources, therefore, must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. In an archaeological deposit, integrity is assessed with reference to the preservation of material constituents and their culturally and historically meaningful spatial relationships. A resource must also be judged with reference to the particular criteria under which it is proposed for nomination.

City of Vista General Plan

The Resource Conservation and Sustainability (RCS) Element of the Vista General Plan 2030 includes the following goals related to cultural resources:

RCS Goal 11: Continue to preserve and protect places, buildings, and objects that embody the City's social, cultural, commercial, architectural, and agricultural history.

RCS Goal 12: Acknowledge, preserve, and protect the City's Native American Heritage.

Sub-items under Goal 12 mandate coordination with the State Native American Heritage Commission (NAHC) and the San Luis Rey Band of Luiseño Mission Indians.

Native American Heritage Values

Under the guidance of the City's General Plan, cultural resources can also include Traditional Cultural Properties (TCP), such as gathering areas, landmarks, and ethnographic locations in addition to archaeological districts. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices (Parker and King 1998). Generally, a TCP may consist of a single site, or group of associated archaeological sites (district or traditional cultural landscape), or an area of cultural/ethnographic importance.

California State Assembly Bill (AB) 52 revised PRC Section 21074 to include Tribal Cultural Resources as an area of CEQA environmental impact analysis. Further, per new PRC Section 21080.3, a CEQA lead agency must consult with any California Native American tribe that requests consultation and that is traditionally and culturally affiliated with the geographic area of a proposed project to identify resources of cultural or spiritual value to the tribe, even if such resources are already eligible as historical resources as a result of cultural resources studies. The City has initiated consultation with the registered tribes; the consultation results will be addressed separately in the CEQA document for this project.

ENVIRONMENTAL SETTING

The project area is in the foothills of northern San Diego County, where the climate is characterized as Mediterranean hot summer. Annual temperatures range from an average January low of about 40° to 44°Fahrenheit (F) to an average July high of about 80° F, and annual rainfall averages around 15 inches

(Griner and Pryde 1976). The project site is located a half-mile south of Buena Vista Creek, at an elevation ranging from 360 to 400 feet above mean sea level (AMSL).

The project area is underlain by Mesozoic granitic rock, consisting predominantly of mid-Cretaceous Tonalite, undivided (Kennedy and Tan 2002; Rogers 1965). Granitic outcrops in the vicinity provided bases for bedrock milling, and granitic rock was used for other milling implements, such as metates, manos, and pestles. Soils on the property are mapped as Fallbrook sandy loam, 9 to 15 percent slopes, eroded (Web Soil Survey n.d.). This soil is found on hills and is "strongly sloping" (Bowman 1973:48).

Vegetation supported by the soils in the general vicinity of the project area consists of annual grasses and forbs, oak or broadleaf chaparral, intermittent areas of chamise, and scattered oaks and shrubs (Bowman 1973). These vegetation communities would have provided a number of plant species known to have been used by the Luiseño people for food, medicine, tools, shelter, ceremonial and other uses (Bean and Shipek 1978; Sparkman 1908). Many of the animal species found in these communities would have been used by native populations as well. Prehistorically, the Buena Vista Creek and other nearby seasonal streams would have provided excellent water sources for local Native American populations. The accompanying riparian environment of the creek would have held a variety of resources, as well as habitat for wildlife, which would have been utilized in multiple ways by the Native American inhabitants.

CULTURAL ENVIRONMENT

Prehistory

The earliest well-documented sites in the San Diego area belong to the San Dieguito Tradition, dating to over 9,000 years ago (Warren 1967; Warren et al. 1998). The San Dieguito Tradition is thought by most researchers to have an emphasis on big game hunting and coastal resources (Warren 1967). Diagnostic material culture associated with the San Dieguito complex includes scrapers, scraper planes, choppers, large blades, and large projectile points (Rogers 1939; Warren 1967). In the southern coastal region, the traditional view of San Diego prehistory has the San Dieguito Tradition followed by the Archaic Period, dating from circa 8600 Before Present (BP) to circa 1300 BP (Warren et al. 1998).

A large number of archaeological site assemblages dating to this period have been identified at a range of coastal and inland sites. These assemblages, designated as the La Jolla/Pauma complexes, are considered part of Warren's (1968) "Encinitas tradition" and Wallace's (1955) "Early Milling Stone Horizon." The Encinitas tradition is generally "recognized by millingstone assemblages in shell middens, often near sloughs and lagoons" (Moratto 1984:147) and brings a shift toward a more generalized economy and an increased emphasis on seed resources, small game, and shellfish. The local cultural manifestations of the Archaic period are called the La Jollan complex along the coast and the Pauma complex inland. Pauma complex sites lack the shell that dominates many La Jollan complex site assemblages. Sites dating to the Archaic Period are numerous along the coast, near-coastal valleys, and around estuaries. In the inland areas of San Diego County, sites associated with the Archaic Period are less common relative to the Late Prehistoric complexes that succeed them (Cooley and Barrie 2004; Laylander and Christenson 1988; Raven-Jennings and Smith 1999; True 1970). The La Jolla complex tool assemblage is dominated by rough cobble tools, especially choppers and scrapers (Moriarty 1966). The La Jolla complex tool assemblage also includes manos and metates, terrestrial and marine mammal remains, flexed burials, doughnut stones, discoidals, stone balls, plummets, biface points, beads, and bone tools (True 1958, 1980).

While there has been considerable debate about whether San Dieguito and La Jollan patterns might represent the same people using different environments and subsistence techniques, or whether they are separate cultural patterns (e.g., Bull 1983; Ezell 1987; Gallegos 1987; Warren et al. 1998), abrupt shifts in subsistence and new tool technologies occur at the onset of the Late Prehistoric Period (1500 BP to AD 1769). The Late Prehistoric period is characterized by higher population densities and intensification of social, political, and technological systems. The Late Prehistoric period is represented by the San Luis Rey (SLR) complex in the northern portion of San Diego County and the Cuyamaca complex in the southern portion.

The SLR complex is divided into two phases: SLR I and SLR II. Elements of the SLR complex include small, triangular, pressure-flaked projectile points (generally Cottonwood series, but Desert Side-notched series also occurs); milling implements: mortars and pestles, manos and metates, and bedrock milling features; bone awls; Olivella shell beads; other stone and shell ornaments; and cremations (Meighan 1954; Moratto 1984; True et al. 1974). The later SLR II complex also includes several elements not found in the SLR I complex: "pottery vessels, cremation urns, red and black pictographs, and such nonaboriginal items as metal knives and glass beads" (Meighan 1954:223). SLR I was originally thought to date from AD 1400 to AD 1750, with SLR II dating between AD 1750 and AD 1850 (Meighan 1954). However, that division was based on the assumption that the Luiseño did not practice pottery manufacture until just prior to the arrival of the Spanish. The chronology has since been revised due to evidence that pottery may have been introduced to the Luiseño circa AD 1200-1600. Ceramics were probably introduced from the Luiseños' southern neighbors, the Kumeyaay (True et al. 1974).

Ethnography

Based on ethnographic data, including the areas defined for the Luiseño at the time of contact, it is now generally accepted that the Cuyamaca complex is associated with the Yuman Kumeyaay and the SLR complex with the Luiseño. Agua Hedionda Creek is often described as the division between the territories of the Luiseño and the Kumeyaay people (Bean and Shipek 1978; Luomala 1978), although various archaeologists and ethnographers use slightly different boundaries. Native people know their traditional use areas through traditional stories and songs. The Luiseño creation story indicates that the Luiseño people have always been here, not migrating from elsewhere. The creation story of the Pechanga Band of the Luiseño tells that the world was created at Temecula. "The Káamalam [first people] moved to a place called Nachíivo Pomíisavo, but it was too small, so they moved to a place called 'exva Teméeku,' this place you now know as Temeku. Here they settled while everything was still in darkness (DuBois 1908)" (Masiel-Zamora 2013:2). A traditional Luiseño story tells of a great flood, and the people went to higher ground, where they were saved. The San Luis Rey Band say that this higher ground where the people were saved is Morro Hill. Some Luiseño informants indicated the place in this story is a hill just east of Highway 395 in the San Luis Rey River Valley (Cupples and Hedges 1977).

The name Luiseño derives from Mission San Luis Rey de Francia and has been used to refer to the Native people associated with the mission. The Luiseño language belongs to the Cupan group of the Takic subfamily and is part of the widespread Uto-Aztecan language family (Bean and Shipek 1978; Sparkman 1908; White 1963). Neighboring peoples who speak Cupan languages are Cupeño and Cahuilla.

Project Area

A survey of the Buena Vista Creek area by Wallace during the 1950s resulted in the documentation of 37 open habitation sites (recorded as campsites) within the watershed. Wallace noted that no rock shelters, quarries, or workshop sites were found. Fifteen of the sites recorded had marine shellfish remains, but shell was abundant at only three of the sites (Wallace 1960). Most of the sites also had ground stone and flaked stone artifacts, and three sites included bedrock milling features. Ceramic sherds were found at three of the sites, indicating a Late Prehistoric component.

Oxendine (1983) indicated that an Indian village called Buena Ventura was noted near Buena Vista Ranch in 1847 by "John S. Griffin, assistant surgeon with Kearney's Dragoons. Surveyors of the General Land Office subsequently observed a village in S 19 of T 11S, R 3W (Harvey 1974:37)" Oxendine 1983:111). Oxendine noted that this village is probably represented by sites CA-SDI-649, CA-SDI-655, and CA-SDI-654. Although she does not give a Luiseño place name for the village, ethnographic information from Harrington on file with Pechanga Cultural Resources lists the place names *Té' ave* or *Tee' evi* for a village close to the Buena Vista Ranch House. The name means "belly place": *Té* means belly; *ave* means empty. Other Luiseño place names have been recorded in the vicinity, including the name *Chahu'kka P.:mnPv* for CA-SDI-654, known as Indian Rock.

Historical Background

While Juan Rodriguez Cabrillo visited San Diego briefly in 1542, the beginning of the historic period in the San Diego area is generally given as 1769. It was that year that the Royal Presidio of San Diego was founded on a hill overlooking Mission Valley. The Mission San Diego de Alcalá was constructed in its current location five years later. The Spanish Colonial period lasted until 1821 and was characterized by religious and military institutions bringing Spanish culture to the area and attempting to convert the Native American population to Christianity. Mission San Diego was the first mission founded in Southern California. Mission San Luis Rey, in Oceanside, was founded in 1798. Asistencias (chapels) were established at Pala (1816) and Santa Ysabel (1818).

The Mexican period lasted from 1821, when California became part of Mexico, to 1848, when Mexico ceded California to the United States under the treaty of Guadalupe Hidalgo at the end of the Mexican-American War. Following secularization of the missions in 1834, mission lands were given as large land grants to Mexican citizens as rewards for service to the Mexican government. The society made a transition from one dominated by the church and the military to a more civilian population, with people living on ranchos or in pueblos. With the numerous new ranchos in private hands, cattle ranching expanded and prevailed over agricultural activities.

The project area is situated within the former Buena Vista Rancho land grant. The rancho was granted to a Luiseño Indian named Felipe Tubua (sometimes referred to as Felipe Subria) in 1845, who had first occupied the land in 1836 (Van Wormer 1988). In 1852, Jesus Machado became the next owner of the rancho, and it was the Machado family who built the original Rancho Buena Vista adobe. The rancho was sold to Lorenzo Soto and eventually became the property of Colonel Cave J. Couts, who also held the nearby Rancho Guajome, located a short distance to the north of the project site. Rancho Buena Vista was primarily used for grazing cattle and horses, but the two ranchos were also the center of much social activity, and dozens of Native Americans worked at the ranchos.

The American period began in 1848, when California was ceded to the United States. The territory became a state in 1850. Terms of the Treaty of Guadalupe Hidalgo brought about the creation of the Lands Commission in response to the Homestead Act of 1851, which was adopted as a means of validating and settling land ownership claims throughout the state. Few of the large Mexican ranchos remained intact, due to legal costs and the difficulty of producing sufficient evidence to prove title claims. Much of the land that once constituted rancho holdings became available for settlement by immigrants to California. The influx of people to California and to the San Diego region resulted from several factors, including the discovery of gold in the state, the end of the Civil War, the availability of free land through passage of the Homestead Act, and later, the importance of San Diego County as an agricultural area supported by roads, irrigation systems, and connecting railways. During the late nineteenth and early twentieth centuries, rural areas of San Diego County developed small agricultural communities centered on one-room schoolhouses. Such rural farming communities consisted of individuals and families tied together through geographical boundaries, a common schoolhouse, and a church. Farmers living in small rural communities were instrumental in the development of San Diego County. They fed the growing urban population and provided business for local markets. Rural farm school districts represented the most common type of community in the county from 1870 to 1930.

Settlement of the project vicinity by white settlers began in the late 1880s, and a post office, store, and station were established in the town of Vista. Intensive agriculture in the area began in 1926, when water from Lake Henshaw became available (Wallace 1960). Groves and other agricultural uses are shown in the vicinity of the project on historic aerial photographs (NETR Online 2019).

STUDY METHODS

HELIX conducted a records search at the South Coastal Information Center (SCIC) on May 24, 2018. The records search covered a one-mile radius around the project area and included archaeological and historical resources, locations and citations for previous cultural resources studies, as well as a review of the state OHP historic properties directory. The records search results are included as Confidential Appendix A to this letter report.

HELIX contacted the NAHC on May 31, 2018 for a Sacred Lands File search and list of Native American contacts for the project area. Letters were sent to the recommended tribal contacts on June 19, 2018.

Historic maps and aerial photographs were reviewed to assess the potential for historic archaeological resources. Maps included the 1893 and 1901 USGS 15-minute Escondido quadrangle topographic maps and the 1948 and 1968 USGS 7.5-minute San Marcos quadrangles. Government Land Office (GLO) Plat Maps were researched and downloaded from the Bureau of Land Management's (BLM) GLO Records website. These include the survey plats from 1876, 1885, and 1904. Historic aerial photographs from 1938, 1946, 1953, 1964, 1967, and 1980 were reviewed at historicaerials.com (NETR Online 2019).

HELIX archaeologist Mary Villalobos and Native American monitor Banning Taylor from Saving Sacred Sites (San Luis Rey Band) surveyed the project area on May 30, 2018.The entire project area was found to be located within low lying hills, in a residentially developed area, resulting in the project site area being highly disturbed. The landscaping vegetation was mostly non-native as well. Photographs were taken of the project area.

RESULTS

SCIC has a record of thirty-nine cultural resources studies conducted within the one-mile radius records search area. Six studies, or surveys, have occurred within a quarter-mile of the project area; no previous studies have specifically covered the project site, but two large-scale studies encompass the project area: A Cultural Resources Evaluation for the Vista and Buena Sanitation District 2007 Sewer Master Plan Update (SD-11524; Rosenberg et al. 2007), and an Historic Resource Survey, A Project of the City of Vista, California (SD-11228; Marben-Laird Associates 1987).

Twenty-six resources have been recorded within the one-mile search radius (Table 1, *Previously Recorded Resources within One Mile of the Project Area*). The resources recorded within the search radius consist of five prehistoric campsites, one prehistoric adobe structure, two prehistoric bedrock milling stations, six historic sites, five historic buildings, and seven historic structures. No resources were identified within the project site; one resource (P-37-028783) is located within a quarter-mile southeast of the project site, and is recorded as an historic building constructed in the California Mission Revival Architectural Style in the 1930's.

Table 1
PREVIOUSLY RECORDED RESOURCES WITHIN ONE MILE OF THE PROJECT AREA

Primary Number (P-37-#)	Trinomial (CA-SDI-#)	Description	Recorder, Date
000646	646	Prehistoric campsite with four bedrock mortars, a slab metate, and a shell scatter.	Wallace, 1958
000647	647	Rancho Buena Vista Adobe – pre-contact campsite with ground stone implements underneath a historic adobe ranch house.	Wallace, 1958
000648	648	Original record describes a disturbed campsite on a knoll, with ground stone implements and two hammerstones. Later survey observed a heavily disturbed sparse shell and lithic scatter.	Affinis, 1991; Wallace, 1958
000649	649	Late Period San Luis Rey site with bedrock milling and associated milling implements and habitation debris (marine shell, ceramic sherds, flaked stone lithics including bifaces and projectile points, modified and unmodified faunal artifacts).	Robbins-Wade et al., 1991; Wallace 1958
000650	650	Prehistoric campsite with bedrock milling (one mortar) and ceramic sherds (in owner's collection).	Wallace, 1958
000651	651	Prehistoric campsite on a knoll, one mano observed.	Wallace, 1958
000652	652	Bedrock milling complex with a shell scatter and ground stone (one metate).	Wallace, 1958
000653	653	Prehistoric campsite consisting of ground stone and flaked stone tools. Site also contains Delpy House.	Wallace, 1958
015574	14323	Two historic rectangle shaped concrete foundations associated with the railroad.	Gallegos & Associates, 2007; James et al., 1996
015575	14324	Historic site containing two foundations adjacent to another historic foundation and an historic building across the railroad tracks.	Gallegos & Associates, 2007; James et al., 1996

Table 1 (cont.)
PREVIOUSLY RECORDED RESOURCES WITHIN ONE MILE OF THE PROJECT AREA

Primary Number (P-37-#)	Trinomial (CA-SDI-#)	Description	Recorder, Date
027667	--	The Rancho Buena Vista ranch house. A single-story, L-shaped adobe constructed between 1854 and 1904.	Allicotti, 2006; Marben-Laird Associates, 1987
028764	--	Historic commercial bank structure constructed in the Simple Renaissance Revival architectural style in 1928.	Marben-Laird Associates, 1987
028766	--	Historic commercial/barn structure (Red Barn); constructed in 1913.	Marben-Laird Associates, 1987
028769	--	Historic residential building (Smith/S.O.S. House); constructed in the California Ranch Style between 1928 and 1930.	Marben-Laird Associates, 1987
028771	--	Historic residential building (McCurdy/ Morton House); constructed in the Spanish Colonial Revival architectural style in 1928.	Marben-Laird Associates, 1987
028772	--	Historic commercial structure (AVO Theater); constructed in the Art Deco architectural style in 1948.	Marben-Laird Associates, 1987
028773	--	Historic public structure (American Legion Post #365); constructed in the Art Deco architectural style in 1948.	Marben-Laird Associates, 1987
028775	--	Historic commercial structure (Dutch Bakery); constructed in the commercial architectural style with Art Deco detailing in 1940.	Marben-Laird Associates, 1987
028776	--	Historic commercial structure originally utilized as an industrial building (Santa Fe Railroad Depot). Built in the Stick Architectural Style with Queen Anne detailing in 1913 and 1983.	Marben-Laird Associates, 1987
028777	--	Wildwood Park. Donated to the community in 1925 by F.J. and Helen Knight, the owners of Rancho Buena Vista.	Marben-Laird Associates, 1987
028778	--	Historic commercial structure (Sheffields Department Store); constructed in the Commercial Architectural Style in 1948.	Marben-Laird Associates, 1987
028780	--	Historic residential building (James Armstrong house); constructed in the Spanish Colonial Revival Architectural Style in 1936.	Marben-Laird Associates, 1987
028781	--	Historic residential building (Neva Clement house); constructed in the California Ranch Architectural Style in 1932.	Marben-Laird Associates, 1987
028783	--	Historic residential building; constructed in the California Mission Revival Architectural Style in the 1930s.	Marben-Laird Associates, 1987
031692	--	Historic site consisting of a trash scatter dating from the early twentieth century.	Affinis, 2010
036435	--	Historic site consisting of a trash scatter dating between 1930 and 1980.	Davison et al., 2017

The NAHC indicated that a Sacred Lands File search was conducted with negative results. Three responses were received from the letters sent to the contacts provided by the NAHC. The Viejas Band of Kumeyaay Indians responded in a letter dated June 27, 2018 that the project area has cultural significance or ties to the Kumeyaay Nation. They recommend that the San Pasqual Band of Mission Indians (San Pasqual) be contacted, and request that all relevant environmental laws be followed, and

that San Pasqual be contacted on any project changes or inadvertent discoveries. The Rincon Band of Luiseño Indians responded on August 8, 2018, that the project area is within the Territory of the Luiseño people, and within the tribe's specific area of historic interest. The response notes the Luiseño place name of *ámá 'chave*, located less than a half-mile to the northeast of the project. The Pala Band of Mission Indians responded on September 17, 2018, that the project area is within the boundaries of the territory that the tribe considers its Traditional Use Area, and request to kept informed of the project. They also recommend archaeological monitoring, "given the known proximity of cultural and historic resources". Native American correspondence is included as Confidential Appendix B.

The project site was surveyed for cultural resources by HELIX and Saving Sacred Sites in May 2018. The entire project area was found to be highly disturbed by modern residential development and non-native landscaping (Plate 1 and 2). Accessible portions of the project area, primarily along the road shoulders, were intensively surveyed; no prehistoric or historic cultural material was observed.

Plate 1, Overview of project area along Crescent Drive, view to the southeast.

Plate 2, Overview of project area along Avalon Drive, view to the north.

The 1876 GLO survey plat for T11S/R3W shows the "San Diego Road" running north-south through section 19 to the west of the project. The "Ranch House of the Buena Vista" (P-37-000677 [Rancho Buena Vista Adobe]) is shown to the north of the project. The 1885 plat map indicates several additional roads in the project vicinity, including a southwest-northeast trending road through section 19 indicated as Road from Milpitos to Buena Vista. In additional, several more houses are shown including "Ruins of Felipe's House", "Machada's House", and "Buena Vista House" (P-37-000677) to the north of the project site and "Carter's House" to the south of the project site. Similar roads and structures are seen on the 1893 and 1901 USGS 15-minute Escondido quadrangle topographic maps.

Historic aerial photographs show the project area characterized by agricultural uses from 1938 to the 1950s (NETR Online 2019). Three residences are seen on the 1938 aerial to the west, north, and southeast of the project, and Crescent Drive is shown in its current alignment. Similar conditions are shown on the 1946 aerial and 1948 USGS 7.5-minute San Marcos quadrangle, with the addition of a few more houses. A trend of increasing residential development and decreasing orchard fields is observed on the 1953 aerial, and Orange Grove Avenue and Avalon Drive are shown as being newly graded. By 1964, very few orchards remain in the project vicinity, and a majority of the project area is developed with residential houses. On the 1968 USGS 7.5-minute San Marcos quadrangle, the project area is illustrated as a generalized urban area.

IMPACTS AND SIGNIFICANCE

Impacts and Mitigation Measures Identified in the SPEIR

The SPEIR identified the following potentially significant impacts to archaeological resources and Tribal Cultural Resources and implemented mitigation measures to reduce construction-related impacts to a less-than-significant level (refer to Appendix A of the CSMP Final SPEIR, Mitigation, Monitoring, and Reporting Program).

Impact 4.3-2: Potential impacts to cultural resources could result from clearing, trenching, and grading activities associated with the construction of pipelines or other related facilities and any rehabilitations of existing pipes, which may result in disturbing native soil.

Impact 4.3-5: Multiple improvements proposed under the 2017 CSMP would involve ground disturbing construction activities that would occur within 100 feet of potentially significant pre-historic and historic archaeological resources. These direct impacts could be significant.

CULT-2 - Project-Specific Archaeological Survey. Prior to the issuance of project-specific construction documents for CIP Capacity and Condition Projects (Hardscape and Cross County Environs), Pump Station Rehabilitations, and Out-of-Service Area Projects, a Qualified Archaeologist approved by the City shall contact the NAHC regarding a Sacred Lands File Search for the project area. In addition, the City shall request a written response from the San Luis Rey Band of Mission Indians (SLR Band) (a tribe traditionally and culturally affiliated with the site) regarding whether the site of the 2017 CSMP improvement project may potentially affect Native American resources. If the NAHC and/or the SLR Band confirms potential known resources, a pedestrian survey (i.e., physical walk over) shall first be conducted by the Qualified Archaeologist and a TCA (traditionally and culturally affiliated) Native American Monitor. Should the pedestrian survey identify Native American cultural resources, the Qualified Archeologist shall, in consultation with the TCA Native American monitor and the SLR Band,

make an immediate written evaluation of the significance and appropriate treatment of the resource, including any avoidance measures, additional testing and evaluations, or data recovery plans, and Pre-Excavation Agreements with the Tribe. If the SLR Band confirms, in consultation with the Qualified Archaeologist, that there is a potential for unknown resources to be uncovered during construction activities, then Mitigation Measure CULT-3, Archaeological Monitoring, shall be implemented.

Project-Specific Impact Analysis

No archaeological resources have been identified within the project site; therefore, no impacts to cultural resources are anticipated. The NAHC was contacted for a Sacred Lands File search, which was returned with negative results. During the pedestrian field survey, no prehistoric or historic cultural material was identified, and little native ground surface appears to be remaining within the project area.

Although the project area is situated in an area that is rich in prehistoric cultural resources, the majority of the sites are situated closer to Buena Vista Creek, located a half-mile to the north of the project. Only one cultural resource, a historic residential building (P-37-028783), has been previously documented within a quarter-mile radius from the project site. In addition, the sewer main and connecting sewer laterals are located on a hillside that is underlain by granitic rock, with no visible outcrops situated along the project alignment. Based on the 1938 aerial, the project area was cultivated at least 80 years ago, and Crescent Drive appears to have been graded (and possibly paved) at this time. The location of the project site on a hillside with shallow soil deposits and being underlain be granitic rock highly precludes the possibility of cultural material being buried under the roadway. Both Orange Grove Avenue and Avalon Drive were established in the 1950s, along with the majority of the residences situated within the project area, which resulted in the terracing of the project site for the house lots, further diminishing the possibility of subsurface cultural material being present within the project alignment.

While Crescent Drive has been in its current alignment for at least 80 years, it is not one of the main or original roads established in Vista or the general region. It does not appear on the GLO survey plats from the 1800s, nor is it on the 1893 or 1901 USGS 15-minute Escondido quadrangle topographic maps. It is a typical residential road, and by the early 1900s is one of hundreds in the vicinity. The roadway has been maintained throughout its existence; in the 1950s it appears to have been further graded and widened for the construction of the residences along the roadway. As visible on historic aerial photographs, throughout the subsequent years, the road appears to continuously be maintained, paved, and striped, with sidewalks and bikeway being constructed along the south side of the Drive by 1980. Furthermore, the project does not propose a realignment, and the impacts to the roadway will be temporary. A such, the roadway does not warrant recordation and evaluation as a historical resource under CEQA.

RECOMMENDATIONS

Based on the archival research and field survey, no cultural resources were identified within the project site and it is unlikely that subsurface cultural resources are present in the area proposed for activity. This letter report fulfills the requirements of SPEIR mitigation measure CULT-2, Project-Specific Archaeological Survey. As noted above, the Pala Band of Mission Indians has recommended archaeological monitoring given the known proximity of cultural and historic resources. Specific resources were not indicated by the tribe, and based on the results of the field survey, no further cultural resources work or archaeological monitoring is recommended. However, in the event that cultural resources are encountered during ground-disturbing activities, work in the immediate vicinity

will be suspended until the discovery is assessed by a qualified archaeologist and TCA Native American monitor, and treatment is determined.

Although there is no evidence to suggest the presence of human remains, in the unlikely event that human remains are encountered during ground-disturbing activities, all work will cease, and the San Diego County Medical Examiner will be contacted, per the California Public Resources Code and SPEIR mitigation measure CULT-5, Disturbance to Human Remains. In the event that the remains are determined to be of Native American origin, the Most Likely Descendant (MLD), as identified by the NAHC, shall be contacted in order to determine proper treatment and disposition of the remains.

If you have any questions, please contact me at (619) 462-1515.

Stacie Wilson, RPA
Senior Archaeologist

Attachments:
Figure 1 Regional Location
Figure 2 USGS Topography
Figure 3 Aerial Photograph

Confidential Appendices:
A Records Search Summary and Map
B NAHC and Native American Correspondence

REFERENCES

Bean, Lowell John, and Florence C. Shipek
1978 Luiseño. In *California*, edited by Robert F. Heizer, pp. 550-563. *The Handbook of North American Indians*, vol. 8. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bowman, Roy H.
1973 *Soil Survey: San Diego Area*. United States Department of Agriculture. Beltsville, MD.

Bull, Charles S.
1983 Shaking the Foundations: The Evidence for San Diego Prehistory. Casual Papers: Cultural Resource Management 1(3):15-64. Cultural Resource Management Center, San Diego State University.

City of Vista
2017 Comprehensive Sewer Master Plan Final Supplemental Program Environmental Impact Report. October.

Cooley, Theodore G., and Laura J. Barrie
2004 Archaeological Excavation at the Village of Pa'Mu, Ramona Valley, California. *Proceedings of the Society for California Archaeology* 17:43–56.

Cupples, Sue Ann, and Ken Hedges
1977 *San Luis Rey River Basin: Overview of Cultural Resources*. San Diego State University Foundation. Prepared for US Army Corps of Engineers. Electronic document, available at http://www.dtic.mil/dtic/tr/fulltext/u2/a146300.pdf. Accessed May 16, 2018.

DuBois, Constance
1908 *The Religion of the Luiseño Indians of Southern California*. *University of California Publications in American Archaeology and Ethnology* 8(3):69-186.

Ezell, Paul H.
1987 The Harris Site – An Atypical San Dieguito Site, or Am I Beating a Dead Horse? In *San Dieguito–La Jolla: Chronology and Controversy*, edited by Dennis Gallegos, pp. 15-22. San Diego County Archaeological Society Research Paper Number 1. San Diego.

Gallegos, Dennis
1987 A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region. In *San Dieguito-La Jolla: Chronology and Controversy*, edited by Dennis Gallegos, pp. 23-34. San Diego County Archaeological Society, Research Paper 1.

Griner, E. Lee, and Philip R. Pryde
1976 Climate, Soils, and Vegetation. In *San Diego: An Introduction to the Region*, edited by Philip R. Pryde, pp. 29-46. 4th edition. Kendall/Hunt Publishing Company, Dubuque, Iowa.

Harvey, Herbert R
1974 The Luiseño: Analysis of Change in Patterns of Land Tenure and Social Structure. In *California Indians* II. David Agee Horr, editor, pp. 97-206. Garland Publishing, Inc., New York.

Kennedy, Michael P., and Siang S. Tan
2002 *Geologic Map of the Oceanside 30 x 60-Minute Quadrangle, California*. Digital preparation by: Kelly R. Bovard, Rachel M. Alvarez, Michael J. Watson, and Carlos I. Gutierrez. California Department of Conservation, California Geological Survey.

Laylander, Don, and Lynne E. Christenson
1988 *Results of an Archaeological Data Recovery Program, Corral Canyon Prehistoric Archaeological District, San Diego County, California*. Report prepared for, and on file at, the Cleveland National Forest, Supervisor's Office, San Diego.

Luomala, Katherine
1978 Tipai-Ipai. In *California*, edited by Robert F. Heizer, pp. 592-609. The *Handbook of North American Indians*, vol. 8. William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Marben-Laird Associates
1987 *Historic Resource Survey, A Project of the City of Vista, California.* Report submitted to City of Vista. Report on file at South Coastal Information Center, San Diego State University.

Masiel-Zamora, Myra Ruth
2013 *Analysis of 'Éxva Teméeku, A Luiseño Indian Village Site Named Temeku, Located in Temecula, California*. Master's thesis, Department of Anthropology, San Diego State University.

Meighan, C. W.
1954 A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215-227.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, Orlando.

Moriarty, James R., III
1966 Cultural Phase Divisions Suggested by Typological Change Coordinated with Stratigraphically Controlled Radiocarbon Dating in San Diego. *The Anthropological Journal of Canada* 4 (4):20-30.

NETR Online
2019 *Historic Aerials*. Nationwide Environmental Title Research, LLC. Electronic document available at: http://www.historicaerials.com.

Office of Historic Preservation (OHP)
1995 Instructions for Recording Historical Resources. California Office of Historic Preservation, Sacramento, CA.

Oxendine, Joan
1983 *The Luiseño Village During the Late Prehistoric Era*. Doctoral dissertation, Department of Anthropology, University of California, Riverside.

Parker, Patricia L. and Thomas F. King
1998 *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Park Service, Washington, D.C.

Raven-Jennings, Shelly, and Brian F. Smith
1999 *Report of Excavations at CA-SDI-4608: Subsistence and Technology Transitions during the Mid-to-Late Holocene in San Diego County*. Brian F. Smith and Associates. Report prepared for the City of Poway. Report on file at the South Coastal Information Center, San Diego State University.

Rogers, Malcolm J.
1939 *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas*. San Diego Museum of Man Papers No. 3. San Diego Museum of Man.

Rogers, Thomas H.
1965 *Santa Ana Sheet, Geologic Map of California.* California Division of Mines and Geology, Sacramento.

Rosenberg, Seth A., Adriane Dorrler, and Brian F. Smith
2007 *A Cultural Resources Evaluation for the Vista and Buena Sanitation District 2007 Sewer Master Plan Update*. Brian F. Smith and Associates. Report on file at South Coastal Information Center, San Diego State University.

Sparkman, Philip Stedman
1908 The Culture of the Luiseño Indians. *University of California Publications in American Archaeology and Ethnology* 8(4):187-234.

True, D. L.
1958 An Early Complex in San Diego County, California. *American Antiquity* 23(3): 255–263.

1970 *Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California*. Monograph 1. Archaeological Survey, University of California, Los Angeles.

1980 The Pauma Complex in Northern San Diego County: 1978. *Journal of New World Archaeology* 3(4): 1–30. Institute of Archaeology, University of California, Los Angeles.

True, D.L., C.W. Meighan, and Harvey Crew
1974 *Archaeological Investigations at Molpa, San Diego County, California.* University of California Publications in Anthropology, Vol 11.

Van Wormer, Stephen R.
1988 Historical and Archaeological Survey of Rancho Buena Vista, Vista California. Report prepared for City of Vista. Report on file at South Coastal Information Center, San Diego State University.

Wallace, William J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11:214-230.

1960 Archaeological Resources of the Buena Vista Watershed, San Diego County, California. *University of California, Los Angeles Archaeological Survey Annual Report 1959-1960*:277-300.

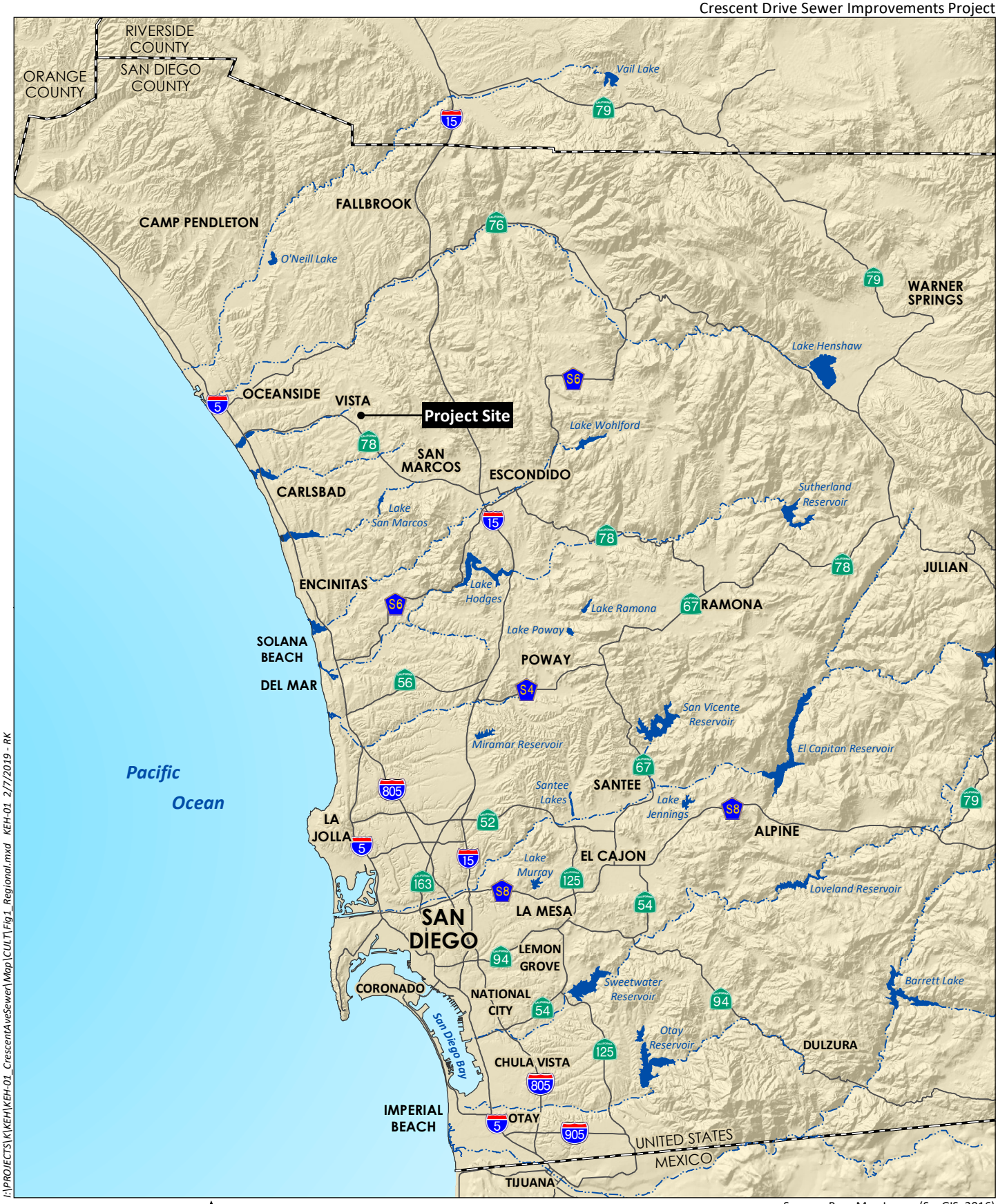
Warren, Claude N.
1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:168-185.

1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by C. Irwin-Williams, pp. 1–14. *Eastern New Mexico Contributions in Anthropology* 1(3). Portales, New Mexico.

Warren, Claude N., Gretchen Siegler, and Frank Dittmer
1998 Paleoindian and Early Archaic Periods. In *Prehistoric and Historic Archaeology of Metropolitan San Diego: A Historic Properties Background Study*. Draft. ASM Affiliates. Report submitted to Metropolitan Wastewater, San Diego.

Web Soil Survey
n.d. Natural Resource Conservation Service. United States Department of Agriculture. Electronic document, available at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed on June 7, 2018.

White, Raymond C.
1963 Luiseño Social Organization. *University of California Publications in American Archaeology and Ethnology* 48(2):91-194.



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\CULT\Fig1_Regional.mxd KEH-01 2/7/2019 - RK

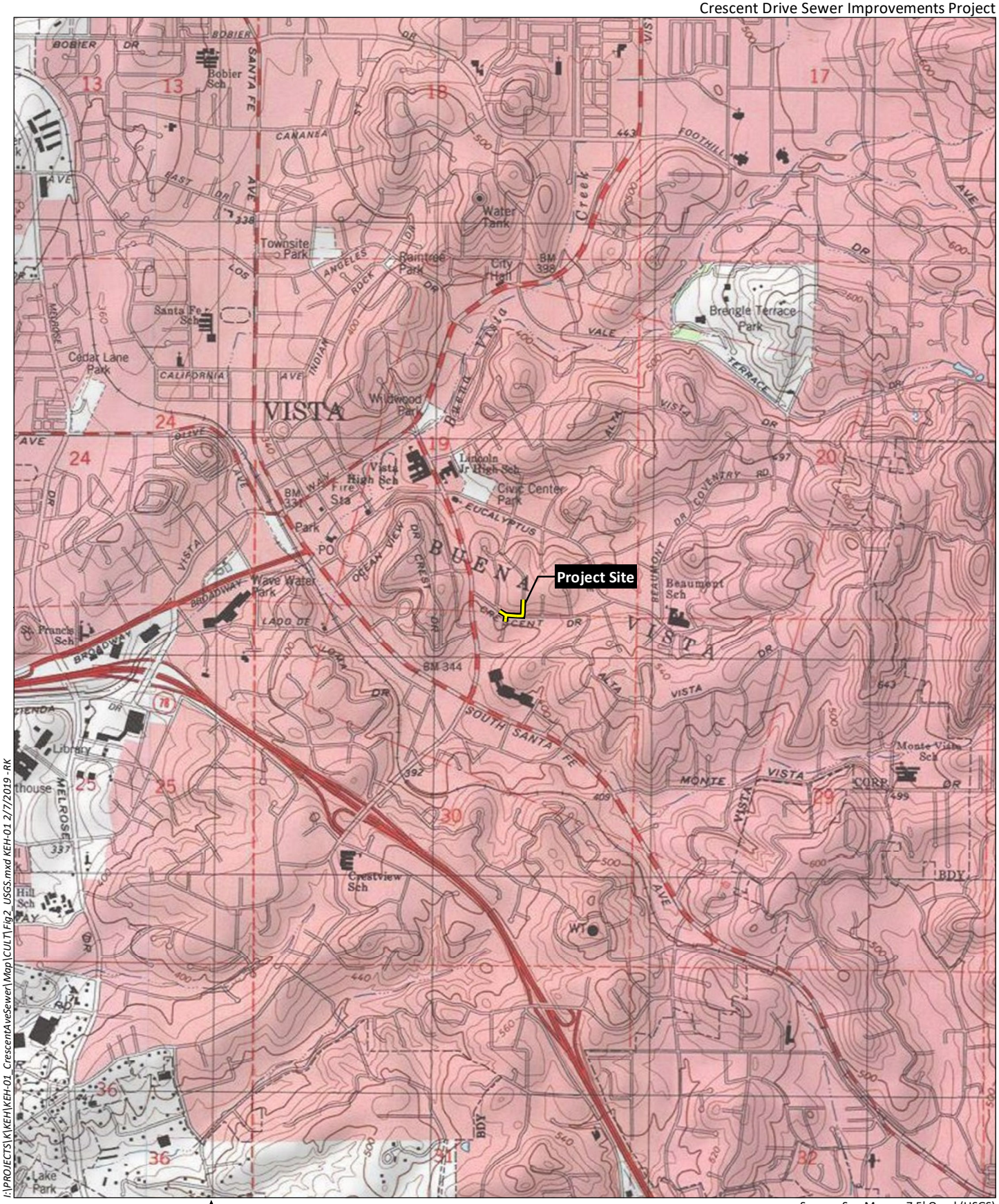
0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1



Source: San Marcos 7.5' Quad (USGS)

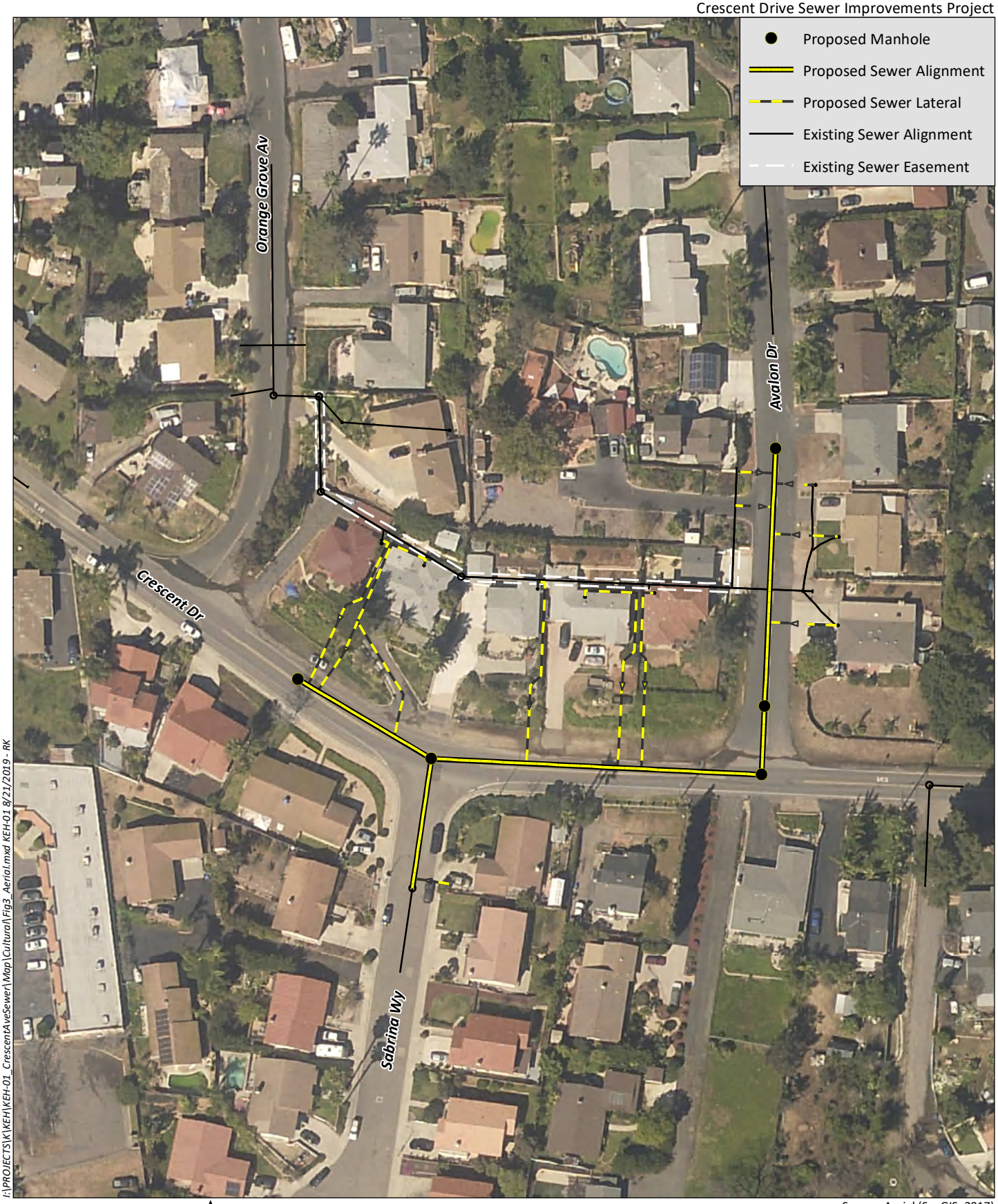
I:\PROJECTS\K\KEH\KEH-01 CrescentAveSewer\Map\CULT\Fig2_USGS.mxd KEH-01 2/7/2019 -RK

HELIX Environmental Planning

USGS Topography

Figure 2

Crescent Drive Sewer Improvements Project



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Cultural\Fig3_AerialA.mxd KEH-01 8/21/2019 - RK

0 100 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Aerial Photograph

Figure 3

Appendix B

Geotechnical Investigation Report

REPORT OF GEOTECHNICAL INVESTIGATION
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)
CITY OF VISTA

Submitted to:

KEH & ASSOCIATES
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Prepared By:

ALLIED GEOTECHNICAL ENGINEERS, INC.
9500 Cuyamaca Street, Suite 102
Santee, California 92071-2685

October 24, 2016

October 24, 2016

Ms. Nita Kazi, P.E.
Senior Engineer
KEH & Associates
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Subject: **REPORT OF GEOTECHNICAL INVESTIGATION**
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)
CITY OF VISTA
AGE Project No. 11D4-A

Dear Ms. Kazi:

Allied Geotechnical Engineers, Inc. is pleased to submit the accompanying report to present the findings, opinions, and recommendations of a geotechnical investigation that was performed to assist KEH & Associates with their preliminary design of the subject project.

We appreciate the opportunity to be of service on this project. If you have any questions regarding the contents of this report or need further assistance, please feel free to contact our office.

Sincerely,

ALLIED GEOTECHNICAL ENGINEERS, INC.

REGISTERED GEOLOGIST
5/31/2018
Nicholas E. Barnes
No. 1693
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
SANI SUTANTO
No. 51873
Exp. 06/30/17
CIVIL
STATE OF CALIFORNIA

Nicholas E. Barnes, P.G., C.E.G.
Senior Geologist

Sani Sutanto, P.E.
Senior Engineer

NEB/SS/TJL:cal
Distr. (1 electronic) Addressee

REPORT OF GEOTECHNICAL INVESTIGATION
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)
CITY OF VISTA

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

Page No.

TABLE OF CONTENTS
(Continued)

Page No.

Figures

TABLE OF CONTENTS
(Continued)

Page No.

Tables

Appendices

1.0 INTRODUCTION

Allied Geotechnical Engineers, Inc. (AGE) is pleased to submit this report to present the findings, opinions, and recommendations of a geotechnical investigation conducted to assist KEH & Associates (KEH) with their preliminary design of the Crescent Drive Sewer Improvement Project for the City of Vista (City). The investigation was performed in conformance with AGE's proposal (revised) dated April 6, 2016, and the subconsultant agreement entered into by and between KEH and AGE on July 19, 2016.

This report has been prepared for the exclusive use of KEH and its design team subconsultants and the City in their design of the project as described herein. The information presented in this report is not sufficient for any other uses or the purposes of other parties.

2.0 SITE AND PROJECT DESCRIPTION

The Crescent Drive Sewer Improvement Project is located in the City of Vista, California (Figure 1 - Location Map). The project study area is located in a well-developed residential neighborhood. Site elevations within the project study area range from approximately 410 feet above mean sea level (msl) to 425 feet msl.

The scope of the proposed project consists of the relocation of an approximately 450 feet of a 6-inch diameter Vitrified Clay Pipe (VCP) sewer pipeline. A review of the Preliminary Design Report Plans (KEH & Associates, undated) indicates that the existing pipeline extends along a City's right-of-way along the rear of residences located on the north side of Crescent Drive between Avalon Drive and Orange Grove Avenue.

We understand that over the years, various improvements have been constructed above the existing sewer. These improvements include paved areas, detached garages, outbuildings, retaining walls, and fencing. We further understand the existing pipeline has reached the end of its useful life. Due to the lack of access, the City plans to relocate the sewer pipeline to Crescent Drive. The new sewer will consist on an 8-inch diameter PVC pipeline. The project will also involve the installation of new sewer laterals to the affected residences on Crescent Drive, and possibly other nearby residences located on Orange Grove Avenue and Avalon Drive.

Based on the information provided by KEH, it is our understanding that the majority of the proposed pipeline will be installed using conventional cut and cover construction methods. We further understand that trenchless construction methods may be utilized for installation of the new sewer laterals. The pipeline invert depth is estimated to be at a maximum depth of 12 feet below the existing ground surface (bgs).

3.0 OBJECTIVE AND SCOPE OF INVESTIGATION

The objectives of this investigation were to characterize the subsurface conditions along the project alignment and to develop geotechnical recommendations for use in the design of the currently proposed project. The scope of our investigation included several tasks which are described in more detail in the following sections.

3.1 Information Review

This task involved a review of readily available information pertaining to the project alignment, including the preliminary project plans, as-built utility maps, topographic maps, published geologic literature and maps, and AGE's in-house references.

3.2 Geotechnical Field Exploration

The field exploration program for this project was performed on September 22 and 23, 2016. A total of four (4) soil borings were performed at the approximate locations shown on Figure 1. The borings were advanced using conventional hollow-stem auger drilling methods to depths ranging from 5.5 feet to 14 feet bgs. A brief description of the location and depth, and the subsurface conditions encountered in each boring is presented in Table 1. A more detailed description of the drilling and sampling activities, and logs of the borings are presented in Appendix A.

Prior to commencement of the field exploration activities, several site reconnaissance visits were performed to observe existing conditions and to select suitable locations for the borings. Subsequently, Underground Service Alert (USA) was contacted to coordinate clearance of the proposed boring locations with respect to existing buried utilities. Existing buried utilities in the vicinity of the project alignment include: potable water and sanitary sewer pipelines; natural gas and electrical transmission lines; and cable, telephone, and fiber optic lines. Traffic control permits were obtained from the City of Vista to perform the borings.

Table 1

Summary of Borings

Boring No.	Location	Depth (feet)	Existing Pavement Section	Subsurface Conditions	Estimated G.W. Depth/ Elevation (feet bgs/feet msl)
B-1	Dirt shoulder at east side of Orange Grove Avenue, approximately 180 feet north of the intersection with Crescent Drive.	5.5 (Refusal on slightly weathered Bedrock)	N/A	Qaf to 0.5 feet and Kg(gv) to the maximum depth of exploration.	Not encountered
B-2	North shoulder of Crescent Drive, approximately 95 feet east of the intersection with Orange Grove Avenue.	5.5 (Refusal on slightly weathered Bedrock)	N/A	Qaf to 0.5 feet and Kg(gv) to the maximum depth of exploration.	Not encountered
B-3	North shoulder of Crescent Drive, approximately 60 feet west of the intersection with Avalon Drive.	7 (Refusal on slightly weathered Bedrock)	N/A	Qaf to 1.5 feet and Kg(gv) to the maximum depth of exploration.	Not encountered
B-4	East side of Avalon Drive, approximately 175 feet north of the intersection with Crescent Drive.	14 (Refusal on slightly weathered Bedrock)	4" A.C.; no base	Qaf to 2 feet and Kg(gv) to the maximum depth of exploration.	Not encountered

Explanation of Abbreviations and Symbols

A.C.	Asphaltic-Concrete
msl	Mean Sea Level
Qaf	Artificial Fill Materials
Kg(gv)	Green Valley Tonalite

3.3 Laboratory Testing

Selected soil samples obtained from the borings were tested in the laboratory to verify field classifications and evaluate certain engineering characteristics. The geotechnical laboratory tests were performed in general conformance with the American Society for Testing and Materials (ASTM) or other generally accepted testing procedures.

The laboratory tests included: in-place density and moisture content, maximum density and optimum moisture content, and sieve (wash) analysis. In addition, representative samples of the onsite soil materials were collected and delivered to Clarkson Laboratories and Supply, Inc. for chemical (analytical) testing to determine soil pH and resistivity, soluble sulfate and chloride concentrations, and bicarbonate content. A brief description of the tests that were performed and the final test results are presented in Appendix B.

4.0 GEOLOGIC CONDITIONS

4.1 Geologic Setting and Site Physiography

The project site is located in the Peninsular Ranges geomorphic province, a north-south oriented mountain range which extends from the southern edge of the Los Angeles Basin into Baja California, Mexico. Basement rocks of the Peninsular Ranges province include Cretaceous crystalline rocks of the Southern California Batholith and Jurassic metasedimentary and metavolcanic rocks of the Santiago Peak Volcanics.

The project study area occupies a hilltop that is underlain by Cretaceous age granitic basement rock of the Green Valley Tonalite. Grading performed during development of the existing land improvements included the placement of man-made fills.

4.2 Tectonic Setting

Tectonically, the San Diego region is situated in a broad zone of northwest-trending, predominantly right-slip faults that span the width of the Peninsular Ranges and extend offshore into the California Continental Borderland Province west of California and northern Baja California. At the latitude of San Diego, this zone extends from the San Clemente fault zone, located approximately 60 miles to the west, and the San Andreas fault located about 95 miles to the east.

Major active regional faults of tectonic significance include the Coronado Bank, San Diego Trough, San Clemente, and Newport Inglewood/Rose Canyon fault zones which are located offshore; the faults in Baja California, including the San Miguel-Vallecitos and Agua Blanca fault zones; and the faults located further to the east in Imperial Valley which include the Elsinore, San Jacinto and San Andreas fault zones.

4.3 Geologic Units

Based on their origin and compositional characteristics, the soil types encountered in the exploratory borings can be categorized into two geologic units which include (in order of increasing age) fill materials and Green Valley Tonalite. A brief description of each unit is presented below.

4.3.1 Fill Materials (Qaf)

Fill was encountered in all four borings to depth ranging from 4 to 24 inches bgs. The fill generally consists of silty sand that appears to have been derived from the weathered portion of the underlying granitic bedrock. Documentation pertaining to the original placement of the fill materials is unavailable.

4.3.2 GreenValley Tonalite (Kg(gv))

The mid-Cretaceous age Green Valley Tonalite (Tan and Kennedy, 1996) was encountered below fill and extended to the maximum depth of exploration in all four borings. The Green Valley Tonalite is described as medium-grained, and lacking abundant inclusions.

The upper portion of the tonalite was found to be moderately to highly weathered in all four borings, and becoming less weathered with depth. Refusal on slightly weathered tonalite was encountered in all four borings. The weathered tonalite encountered in the borings consists primarily of yellow brown to strong brown, damp, very dense silty sand.

4.3 Groundwater

At the time of our field investigation, no groundwater or seepage was encountered in any of the borings. Based on a review of the available data, the depth (elevation) of the regional groundwater table beneath the study area is estimated to be well below the bottom elevation of the proposed trench excavations. It must be noted, however, that localized perched water conditions may be encountered within the project study area, particularly during the wet (rainy) season.

5.0 DISCUSSIONS, OPINIONS AND RECOMMENDATIONS

5.1 Potential Geologic Hazards

5.1.1 Faulting

The project site is not crossed by any known (mapped) active or potentially active faults (Tan & Kennedy, 1996). For the purpose of this project, we consider the Elsinore fault zone (EFZ) and Rose Canyon fault zone (RCFZ) to represent the most significant seismic hazard.

The RCFZ is a complex set of anastomosing and en-echelon, predominantly strike slip faults that extend from off the coast near Carlsbad to offshore south of downtown San Diego (Treiman, 1993). Previous geologic investigations on the RCFZ in the Rose Creek area (Rockwell et. al., 1991) and in downtown San Diego (Patterson et. al., 1986) found evidence of multiple Holocene earthquakes. Based on these studies, several fault strands within the RCFZ have been classified as active faults, and are included in Alquist-Priolo Special Studies Zones. In San Diego Bay, this fault zone is believed to splay into multiple, subparallel strands; the most pronounced of which are the Silver Strand, Spanish Bight and Coronado Bank faults. The study area is not located within an Alquist-Priolo Earthquake Study Zone.

The EFZ is a right-lateral strike slip fault about 180 km in length that extends northwesterly between near Ocotillo in the south and Whittier in the north (www.scedc.caltech.edu). At the north end the fault splits into two segments named the Chino and Whittier faults, with the Laguna Salada fault a southern continuation of the EFZ.

The location of the project site in relation to the active faults in the region is shown on the Regional Fault Map (Figure 2). California Department of Transportation ARS Online (V2.3.07) was used to approximate the distance of the closest ten (10) known faults to the project site. A summary of seismic source characteristics for faults that present the most significant seismic hazard potential to the reservoir is presented in Table 2 below.

Table 2

Summary of Seismic Source Characteristics

Fault	Maximum Magnitude (MMax)	Peak Site Acceleration (g)	Closest Distance to Site (km)
Elsinore (Julian)	7.7	0.167	26.19
Elsinore (Temecula)	7.7	0.167	26.19
Newport-Inglewood (Offshore)	6.9	0.160	18.995
Rose Canyon fault zone (Oceanside Section)	6.8	0.156	18.609
Elsinore (Glen Ivy)	7.7	0.102	47.425
Rose Canyon fault zone (Del Mar Section)	6.8	0.136	21.722
Coronado Bank	7.4	0.093	43.989
San Jacinto (Anza)	7.7	0.077	65.828
San Jacinto (San Jacinto Valley-Southern Extension)	7.7	0.074	68.851
San Jacinto (San Jacinto Valley)	7.7	0.071	71.792

5.1.2 Historical Seismicity

EQSEARCH is a program that performs automated searches of a catalog of historical Southern California earthquakes. As the program searches the catalog, it computes and prints the epicentral distance from a selected site to each of the earthquakes within a specified radius (100 miles). From the computed distance, the program also estimates (using an appropriate attenuation relation) the peak horizontal ground acceleration that may have occurred at the site due to each earthquake.

V_{S30} within the project study area is estimated to be on the order of 600 m/s. The shear wave velocity was calculated based on the corrected blow counts in AGE's borings, and using the correlation method developed by Ohta and Gotto (1978) for cohesive soil and David Boore (2004) extrapolation equation.

$$Vs = 86.9\ (N_{60})^{0.333} \qquad \text{(Ohta \& Goto, 1978)}$$

$$V_{S30} = [1.45 - (0.015 \times d)] \times V_{s(d)} \qquad \text{(David Boore, 2004)}$$

Based on the estimated shear wave velocities and our visual classification of the geologic units encountered in the soil borings, site Class C attenuation was used for all of our analysis. We used a combined earthquake catalog for magnitude 5.0 or larger events which occur within 100 miles from the site between 1800 and December 1999. The earthquake catalog for events prior to about 1933 is limited to the higher magnitude events.

The search results indicate that the nearest earthquake of magnitude 6.5 occurred on November 22, 1900 located about 14.2 miles from the project study area. This earthquake resulted in a calculated ground acceleration of 0.173 g which is also the largest calculated seismic ground acceleration from this search. The largest magnitude earthquake reported was the magnitude 7.6 Landers Earthquake onJune 28, 1992, located 83 miles from the project study area which resulted in a calculated ground acceleration of 0.060 g.

It is our opinion that the major seismic hazard affecting the project study area would be seismic-induced ground shaking. The study area will likely be subject to moderate to severe ground shaking in response to a local or more distant large magnitude earthquake occurring during the life of the proposed facilities. For project design purposes, we recommend that both the EFZ and RCFZ be considered as the dominant seismic sources.

5.1.3 Fault Ground Rupture & Ground Lurching

There are no known (mapped) active or potentially active faults crossing the project study area (Tan and Kennedy, 1996). Therefore, the potential for fault ground rupture and ground lurching along the alignment is considered insignificant.

5.1.4 Soil Liquefaction

Seismically-induced soil liquefaction is a phenomenon in which loose to medium dense, saturated granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground vibrations induced by earthquakes. The findings of our investigation determined that the project study area is underlain by very dense granitic bedrock that is not susceptible to liquefaction.

5.1.5 Landslides

A review of the published geologic map indicate that the project study area is not located on or below any known (mapped) ancient landslides (Tan and Kennedy, 1996). Therefore, landsliding does not represent a potential hazard.

5.1.6 Lateral Spread Displacement

The project study area is underlain by competent granitic bedrock which is not considered susceptible to seismic-induced lateral spreading.

5.1.7 Differential Seismic-Induced Settlement

Differential seismic settlement occurs when seismic shaking causes one type of soil to settle more than another type. It may also occur within a soil deposit with largely homogeneous properties if the seismic shaking is uneven due to variable geometry or thickness of the soil deposit. The project study area is underlain with very dense granitic bedrock which is not prone to differential seismic-induced settlement.

5.1.8 Secondary Hazards

The elevation of the project site and distance from any large open water bodies precludes the potential of property damage from seismic-induced tsunamis and/or seiches. It is our opinion that the potential of property damage due to flooding is remote.

5.2 Soil Corrosivity

Soil is generally considered aggressive to concrete if its chloride concentration is greater than 300 parts per million (ppm) or sulfate concentration is greater than 1,000 ppm, or if the pH is 5.5 or less. Analytical testing was performed on a representative sample of the onsite soil materials to determine pH, resistivity, soluble sulfate, chlorides and bicarbonates content. The tests were performed in accordance with California Test Method Nos. 643, 417 and 422. A summary of the test results is presented in Table 3 below. Copies of the analytical laboratory test data reports are included in Appendix B.

Table 3

Summary of Corrosivity Test Results

	pH	Resistivity (ohm-cm)	Sulfate Conc. (ppm)	Chloride Conc. (ppm)	Bicarbonates Conc. (ppm)
B-2 Sample No. 1 @4'-5'	8.4	1,600	78	64	10
B-4 Sample No. 1 @3'-4'	8.6	4,300	27	11	20

The test results indicate that the onsite soil is not aggressive to concrete. Therefore, Type I, II or III Portland Cement Concrete may be used for proposed facilities within the project study area. AGE does not practice in the field of corrosion engineering. In the event that corrosion sensitive facilities are planned, we recommend that a corrosion engineer be retained to perform the necessary corrosion protection evaluation and design.

5.3 Expansive Soil

Based on visual observations and the laboratory test results, the on-site soils are considered non-expansive.

5.4 Cut-and-Cover Construction

Since no changes to the existing ground surface along the cut-and-cover segment of the proposed pipeline alignment are planned, the net stress change in the underlying soils is considered negligible. Furthermore, the native granitic rock at the proposed invert level along the pipeline alignment is expected to provide a stable trench bottom. In the event that loose or disturbed soils are encountered at the trench bottom, it is recommended that they be over-excavated and replaced with pipe bedding or other approved materials.

5.4.1 Excavation Characteristics

The soil materials within the anticipated depths of excavation for the proposed pipeline consist primarily of granitic rock in variable stages of weathering. Slightly weathered granitic rock which may pose difficult excavation conditions was encountered at depth of 5 feet bgs along Crescent Drive and Orange Grove Avenue, and 14 feet bgs on Avalon Drive.

Southwest Geophysics, Inc. performed a seismic refraction survey along the project alignment. The survey indicates slightly weathered granitic rock (Seismic P-Wave Velocity of 5,000 fps or higher) was encountered at a depth as shallow as 2 feet bgs along Avalon Drive, less than 5 feet bgs along Crescent Drive, and 10 feet bgs along Orange Grove Avenue.

We recommend that the underlying rock be pre-fractured prior to excavation of the proposed pipe trenches. Pre-fracturing can be performed with a chemical product such as Dexpan Non Explosive Demolition Agent. The pre-fracturing process consists of drilling holes into the ground which then will be filled with a mixture of chemical reagent and water. Caps or wooden plugs may be used to contain the chemical mixture. The chemical reaction will cause the mixture to expand and fracture the bedrock. Rock excavation will generally require a combination of vertical and angle holes. The hole spacing and diameter, configuration and depth will depend on the desired depth of excavation and size of rock fragments.

Following the pre-fracturing operation, trenched excavation can be performed with a combination of conventional heavy-duty construction equipment and rockbreaker.

5.4.2 Pipe Loads and Settlement

Pipes should be designed for all loads applied by surrounding soils including dead load from soils, loads applied at the ground surface, uplift loads, and earthquake loads. Soil loading may be estimated assuming a density of 120 pcf for the backfill materials.

Where a pipe changes direction abruptly, resistance to thrust forces can be provided by means of thrust blocks. For design purposes, for the passive resistance against thrust blocks embedded in dense soil materials, an equivalent fluid density of 350 pcf may be used. Thrust blocks should be embedded a minimum of 3 feet beneath the ground surface.

Buried flexible pipes are generally designed to limit deflections caused by applied loads. The deflections can be estimated using the Modified Spangler equation. A modulus of soil reaction, E', equal to 2,000 and 3,000 psi may be used to represent a minimum of 6 inches of compacted pipe bedding materials of low plasticity (LL < 50) with less than 12 percent fines passing the #200 standard sieve and crushed rock materials, respectively.

5.4.3 Trench Backfill

Pipe Bedding Zone and Pipe Zone

"Pipe Bedding Zone" is defined as the area below the bottom of the pipe and extending over the full trench width, and should be at least 6 inches thick in order to provide a uniform firm foundation material directly beneath the pipe.

The "Pipe Zone" is defined as the full width of a trench from the bottom of the pipe to a horizontal level about 6 inches above the top (crown) of the pipe. In order to provide uniform support and to minimize external loads, trench widths should be selected such that a minimum clear space of 6 inches is provided on each side of the pipe. During backfilling, it is recommended that the backfill materials be placed on each side of the pipe simultaneously to avoid unbalanced loads on the pipe.

Backfill materials placed in the "Pipe Bedding Zone" and "Pipe Zone" should consist of clean, free draining sand with a minimum Sand Equivalent value of 50 or crushed rock. Sand should be free of clay, organic matter, and other deleterious materials and conform to the gradation shown below.

Sieve Size	Percent Passing by Weight (percent)
½ inch	100
#4	75-100
#16	35-75
#50	10-40
#200	0-10

Crushed rock should conform to Section 200-1.2 and 200-1.3 of the Standard Specifications for Public Works Construction (SSPWC) for 3/4-inch crushed rock gradation. It must be noted that, since the native soil materials do not meet these specifications, import backfill materials will be required for the "Pipe Bedding Zone" and "Pipe Zone". If crushed rock is used for pipe zone and bedding backfill materials, we recommend that the rock materials be wrapped in geotextile filter fabric such as Mirafi 140N or equivalent. The purpose of the filter fabric is to prevent migration of fine grained materials from the backfill materials, and the sides and bottom of the trench into the rock bedding materials.

Above Pipe Zone

The "Above Pipe Zone" is defined as the full width of the trench from the top of the "Pipe Zone" to the finish grade or bottom of the pavement section. Fill materials within this zone should be free of biodegradable materials, hazardous substance contamination, other deleterious debris, and or rocks or hard lumps greater than 6 inches. If the fill materials contain rocks or hard lumps, at least 70 percent (by weight) of its particles shall pass a U.S. Standard $^{3}/_{4}$-inch sieve. Fill materials should consist of predominantly granular soil (less than 40 percent passing the U.S. Standard #200 sieve) with Expansion Index of less than 50.

Soil materials generated from excavations in the granitic rock will predominantly consist of rock fragments with little or no fine. These materials are not considered suitable for use as compacted trench backfill.

5.4.4 Placement and Compaction of Backfill

Prior to placement, all backfill materials should be moisture-conditioned, spread and placed in lifts (layers) not-to-exceed 6 inches in loose (uncompacted) thickness, and uniformly compacted to at least 90 percent relative compaction. During backfilling, the soil moisture content should be maintained at or within 2 to 3 percent above the optimum moisture content of the backfill materials. It is recommended that the upper 24 inches directly beneath the roadway pavement and the base materials be compacted to at least 95 percent relative compaction. The maximum dry density and optimum moisture content of the backfill materials should be determined in the laboratory in accordance with the ASTM D1557 testing procedures.

Small hand-operated compacting equipment should be used for compaction of the backfill materials to an elevation of at least 4 feet above the top (crown) of the pipes. Flooding or jetting should not be used to densify the backfill.

5.5 Buried Structures

It is recommended that any proposed buried structures be founded on firm granitic bedrock or approved compacted materials. In areas where loose or soft soils are encountered at the bottom of the box structure excavations, it is recommended that the loose/soft materials be removed and replaced with 3/4-inch crushed rock materials wrapped in geotextile fabric which meets or exceeds the specifications shown below.

Fabric Property	Min. Certified Values	Test Method
Grab Tensile Strength	300 lb	ASTM D 4632
Grab Tensile Elongation	35% (MAX)	ASTM D 4632
Burst Strength	600 psi	ASTM D 3786
Trapezoid Tear Strength	120 lb	ASTM D 4533
Puncture Strength	130 lb	ASTM D 4833

The actual extent of over-excavation of any loose/soft soil materials should be evaluated and determined in the field by the City's Resident Engineer.

5.5.1 Placement and Compaction of Backfill

Fill materials used around buried structures should meet the criteria for "Above Pipe Zone" backfill presented in Section 5.4.3. Placement and compaction of backfill materials around the buried structures should be performed in accordance with the recommendations presented in Section 5.4.4 of this report.

5.5.2 Foundations

Bearing Capacity

For design of the buried structures which are founded on firm granitic bedrock or uniformly compacted fill materials an allowable soil bearing capacity of 3,500 and 2,000 psf may be used, respectively. This allowable soil bearing value is for total dead and live loads, and may be increased by one third when considering seismic loads.

Anticipated Settlement

Under static condition, total settlement of the slab foundation is estimated to be less than 0.25 inch. Differential settlement between the center and the edge of the slab foundation is expected not to exceed 0.25 inch. No permanent deformation and/or post-construction settlement is anticipated, provided that backfill around the structures is properly compacted in accordance with the project specifications.

Resistance to Lateral Loads

Resistance to lateral loads may be developed by a combination of friction acting at the base of the slab foundation and passive earth pressure developed against the sides of the foundations below grade. Passive pressure and friction may be used in combination, without reduction, in determining the total resistance to lateral loads.

An allowable passive earth pressure of 250 psf per foot of foundation embedment below grade may be used for the sides of foundations placed against competent native soils or properly compacted fill materials. The maximum recommended allowable passive pressure is 2,500 psf. A coefficient of friction of 0.45 may be used for foundation cast directly on competent native soils or approved compacted materials.

5.5.3 Walls Below Grade

Lateral earth pressures for walls below grade for structures less than 48 inches in horizontal dimensions may be treated as a shaft structure. Walls below grade for structures larger than 48 inches in horizontal dimensions should be designed to resist the lateral earth pressures presented in Figures 3 and 4 provided that the wall backfill materials are properly placed and compacted in conformance with the recommendations presented in this report. Surcharge and foundation loads occurring within a horizontal distance equal to the wall height should be added to the lateral pressures as presented in Figures 5 and 6.

For seismic loading, an triangular pressure distribution of 12 pcf (equivalent fluid pressure, Level II seismic event) may be used in addition to the static earth pressures. This seismic earth pressures may be assumed to act at 0.6H from the bottom of the wall and are applicable for both cantilever and braced conditions. Forces resulting from wall inertia effects are expected to be relatively minor for non-gravity walls and/or walls retaining less than 5 feet of backfill materials, and may be ignored in estimating the seismic lateral earth pressure.

5.6 Trenchless Construction

It is our understanding that, in order to minimize damage to existing hardscape/landscape, trenchless construction methods may be used to install the new sewer laterals. Considering the presence of near-surface granitic bedrock, we do not recommend that trenchless construction method be used to install small diameter lateral connections.

6.0 CONSTRUCTION-RELATED CONSIDERATIONS

6.1 Construction Dewatering

The depth of the local groundwater table is expected to be well below the anticipated depth of the proposed trenched excavations for this project. We therefore do not anticipate the need for dewatering of trenched excavations made during construction. The contractor should, however, anticipate the possible need for sump pumps in the event that localized perched water conditions are encountered during construction. The design, installation, and operation of any construction dewatering measures necessary for the project shall be the sole responsibility of the contractor.

6.2 Temporary Shoring

Since the anticipated pipe invert depths will be more than 4 feet below the ground surface, prevailing Federal and Cal OSHA safety regulations require that the trenched excavation be either sloped (if sufficient construction space or easement is available), shored, braced, or protected with approved sliding trench shield. Limited construction space, the presence of other buried utilities, and the need to avoid excessive community disruption dictate that a shored excavation will be needed along the entire pipeline alignment. Design and construction of temporary shoring should be the sole responsibility of the contractor.

Settlement

Settlement of existing street improvements and/or utilties adjacent to the shoring may occur in proportion to both the distance between shoring system and adjacent structures or utilities and the amount of horizontal deflection of the shoring system. Vertical settlement will be maximum directly adjacent to the shoring system, and decreases as the distance from the shoring increases. At a distance equal to the height of the shoring, settlement is expected to be negligible. Maximum vertical settlement is estimated to be on the order of 75 percent of the horizontal deflection of the shoring system. It is recommended that shoring be designed to limit the maximum horizontal deflection to 1-inch or less where structures or utilities are to be supported.

It is recommended that pre- and post-construction surveys be conducted to document existing site conditions. Documentation should include photographic and video surveys of the existing facilities and site improvements, as well as field surveys of building floors and pavement structures. We further recommend that a weekly survey of existing utilities be performed during the construction phase.

Lateral Earth Pressures

Temporary shoring should be designed to resist the pressure exerted by the retained soils and any additional lateral forces due to loads placed near the top of the excavation. For design of braced shorings supporting fill materials, the recommended lateral earth pressure should be 32H psf, where H is equal to the height of the retained earth in feet. For braced shoring supporting granitic bedrock, the recommended lateral earth pressures may be reduced to 20H psf. Any surcharge loads would

impose uniform lateral pressure of 0.3q, where "q" equals the uniform surcharge pressure. The surcharge pressure should be applied starting at a depth equal to the distance of the surcharge load from the top of the excavation. In the event that the bottom of the excavation is located below the groundwater level, hydrostatic pressure should be added to the lateral loads.

The recommended lateral earth pressures have been prepared based on the assumptions that the shored earth is level at the surface and that the shoring system is temporary in nature.

Lateral Bearing Capacity

Resistance to lateral loads will be provided by passive soil resistance. The allowable passive pressure for the fill materials may be assumed to be equivalent to a fluid weighing 250 pcf. Allowable lateral bearing pressure in fill material should not exceed 2,500 psf. Allowable passive pressure for the granitic bedrock may be assumed to be equivalent to a fluid weighing 350 pcf, with maximum allowable lateral bearing pressure of 3,500 psf.

6.3 Environmental Considerations

The scope of AGE's investigation did not include the performance of a Phase I Environmental Site Assessment (Phase I ESA) to evaluate the possible presence of soil and/or groundwater contamination beneath the project alignment. During our subsurface investigation soil samples were field screened for the presence of volatile organics using a RAE Systems MiniRAE 3000 organic vapor meter (OVM). The field screening did not reveal elevated levels of volatile organics in the samples.

In the event that hazardous or toxic materials are encountered during the construction phase, the contractor should immediately notify the City and be prepared to handle and dispose of such materials in accordance with current industry practices and applicable Local, State and Federal regulations.

7.0 GENERAL CONDITIONS

7.1 Post-Investigation Services

Post-investigation geotechnical services are an important continuation of this investigation, and we recommend that the City retain the services of a qualified geotechnical firm to perform the necessary geotechnical observation and testing services during construction.

Sufficient and timely observation and testing should be performed during excavation, pipeline installation, backfilling and other related earthwork operations. The purpose of the geotechnical observation and testing is to correlate findings of this investigation with the actual subsurface conditions encountered during construction and to provide supplemental recommendations, if necessary.

7.2 Uncertainties and Limitations

The information presented in this report is intended for the sole use of KEH & Associates and other members of the project design team and the City for preliminary project design purposes only and may not provide sufficient data to prepare an accurate bid. The contractor should be required to perform an independent evaluation of the subsurface conditions at the project site prior to submitting his/her bid.

AGE has observed and investigated the subsurface conditions only at selected locations along the project alignment. The findings and recommendations presented in this report are based on the assumption that the subsurface conditions beneath all project alignments do not deviate substantially from those encountered in the exploratory soil borings. Consequently, modifications or changes to the recommendations presented herein may be necessary based on the actual subsurface conditions encountered during construction.

California, including San Diego County, is in an area of high seismic risk. It is generally considered economically unfeasible to build a totally earthquake-resistant project and it is, therefore, possible that a nearby large magnitude earthquake could cause damage at the project site.

Geotechnical engineering and geologic sciences are characterized by uncertainty. Professional judgments and opinions presented in this report are based partly on our evaluation and analysis of the technical data gathered during our present study, partly on our understanding of the scope of the proposed project, and partly on our general experience in geotechnical engineering.

In the performance of our professional services, we have complied with that level of care and skill ordinarily exercised by other members of the geotechnical engineering profession currently practicing under similar circumstances in southern California. Our services consist of professional consultation only, and no warranty of any kind whatsoever, expressed or implied, is made or intended in connection with the work performed. Furthermore, our firm does not guarantee the performance of the project in any respect.

AGE does not practice or consult in the field of safety engineering. The contractor will be responsible for the health and safety of his/her personnel and all subcontractors at the construction site. The contractor should notify the City if he or she considers any of the recommendations presented in this report to be unsafe.

8.0 REFERENCES

Blake, T.F., 2000, EQFAULT and EQSEARCH Version 3.0, updated database 2010.

Boore, D.M., W.B. Joyner, and T.E. Fumal, 1993, "Estimation of Response Spectra and Peak Accelerations from Western North American Earthquakes: An Interim Report", U.S. Geological Survey, Open File Report 93-509.

Boore, D., 2004, Estimating VS30 (or NEHRP Site Classes) from Shallow Velocity Models: Bulletin of the Seismological Society of America, Vol. 94, No. 2, pp. 591–597, April 2004

California Building Standards Commission, "California Building Code", 2013 Edition.

California Department of Transportation ARS Online (Ver. 2.3.06).

Department of Conservation, California Geological Survey Regulatory Hazard Zones Maps for Earthquake Faults, Liquefaction and Landslide Zones, 2009.

Department of Conservation, California Geological Survey Tsunami Inundation Map for Emergency Planning, 2009.

Idriss, I.M., 1991, Empirically-Derived Attenuation Relationships, Report to National Institute of Standards and Technology.

International Conference of Building Officials, 1997, Maps of Known Active Fault Near Source Zones in California and Adjacent Portions of Nevada.

Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000.

KEH & Associates, “Crescent Drive Sewer Improvements, C.I.P. No. 8286”, Level of Completeness 30%, undated.

Kennedy, M.P., et.al., 1975b, Character and Recency of Faulting, San Diego Metropolitan Area, California: California Division of Mines and Geology, Special Report 123.

Lindvall, S.C., and Rockwell, T.K., 1995, “Holocene Activity of the Rose Canyon fault zone in San Diego, California” in Journal of Geophysical Research, v. 100, No. B12, pp. 24,121 - 124,132.

Marshall, M., 1989, "Detailed Gravity Studies and the Tectonics of the Rose Canyon--Point Loma--La Nacion Fault System, San Diego, California" in Proceedings of Workshop on "The Seismic Risk in the San Diego Region: Special Focus on the Rose Canyon Fault System" (Glenn Roquemore, et.al, Editors).

Patterson, R.H., D.L. Schug, and B.E. Ehleringer, 1986, "Evidence of Recent Faulting in Downtown San Diego, California" in Geological Society of America, Abstracts With Programs, v. 18, No. 2, p. 169.

Ohta, Y., and Goto, N., 1978, "Empirical Shear Wave Velocity Equations in Terms of Characteristic Soil Indexes." Earthquake Engineering and Structural Dynamics. 6, pp. 167-187.

Rockwell, T.K., et.al., 1991, "Minimum Holocene Slip Rate for the Rose Canyon Fault in SanDiego, California" in Environmental Perils in the San Diego Region (P.L. Abbott and W.J. Elliott, editors): San Diego Association of Geologists, pp. 37-46.

Tan, S.S and Kennedy, M. P., 1996, " Geologic Map of the Oceanside, San Luis Rey, and San Marcos 7.5' Quadrangles, San Diego County, California", Department of Conservation, Division of Mines and Geology, DMG Open-File Report 96-02.

Treiman, J.A., 1993, "The Rose Canyon Fault Zone, Southern California", California Division of Mines and Geology Open File Report No. 93-02.

Standard Specifications for Public Works Construction ("Green Book"), including the Regional Standards, 2010 Edition.

USGS, Seismic Design Maps, 2014.

FIGURES

N

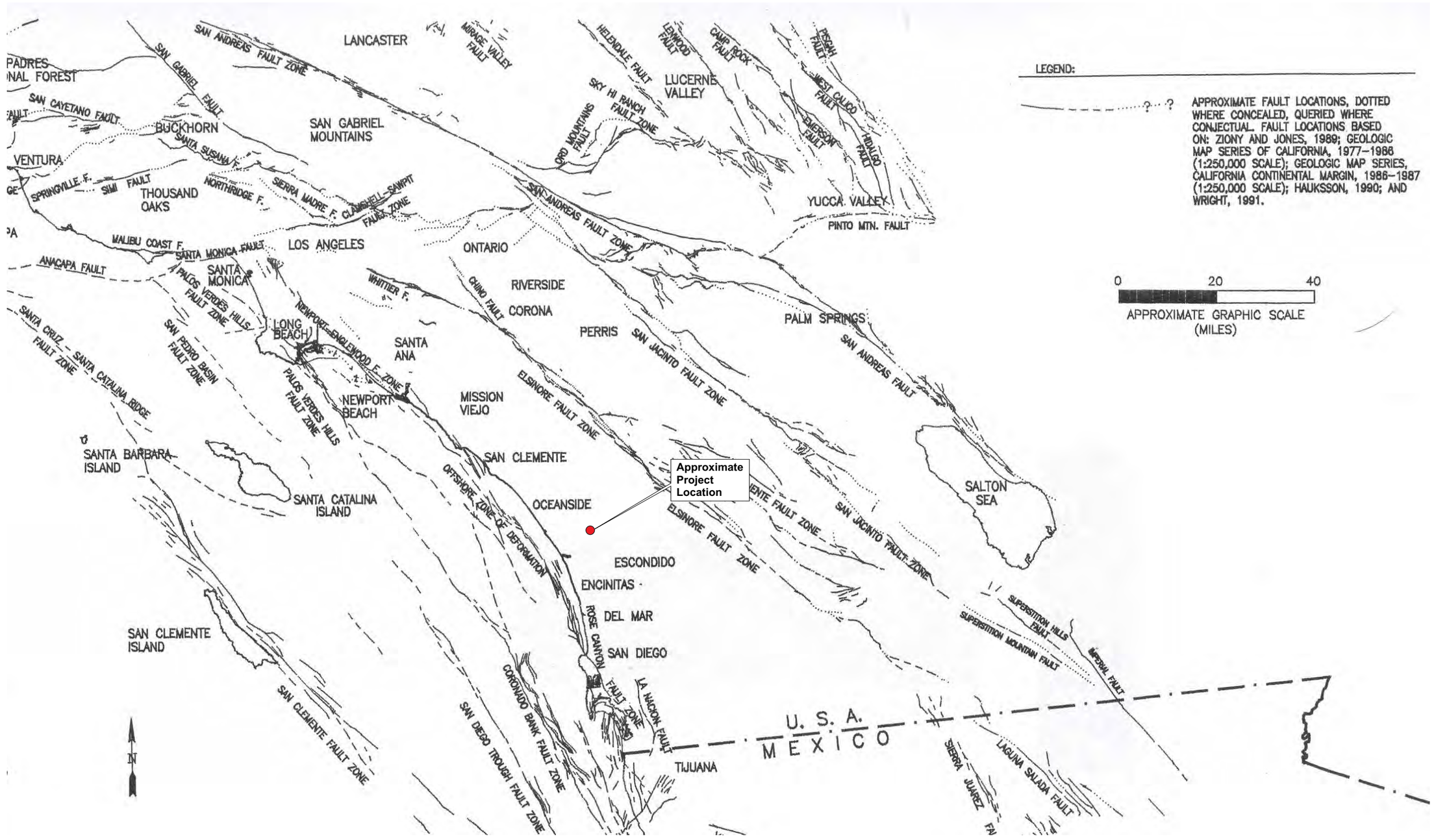
50 FEET

Scale Bar

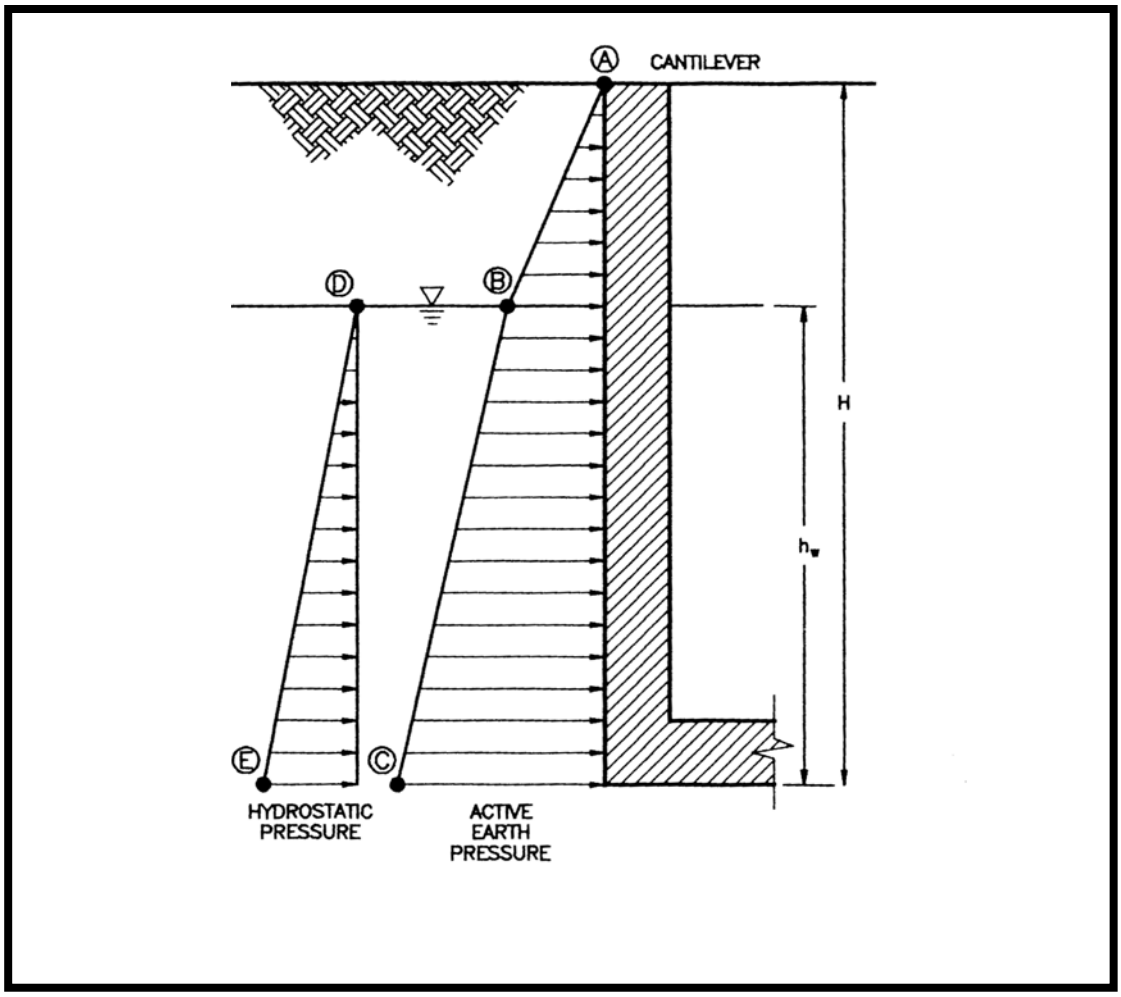
LEGEND

B-1 Approximate Boring Location

CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)	LOCATION MAP	
PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 1



CRESCENT DRIVE SEWER IMPROVEMENTS (CID 8286)	REGIONAL FAULT MAP	
PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 2



NOTES

H = wall height in feet

h_w = water height above bottom of structure in feet

Lateral pressure values presented herein are based on the assumption that non-expansive backfill materials will be used to backfill behind walls

LATERAL PRESSURES

Earth Pressure

Ⓐ = 0

Ⓑ = 35 ($H-h_w$), psf

Ⓒ = 35 ($H-h_w$) + $20h_w$, psf

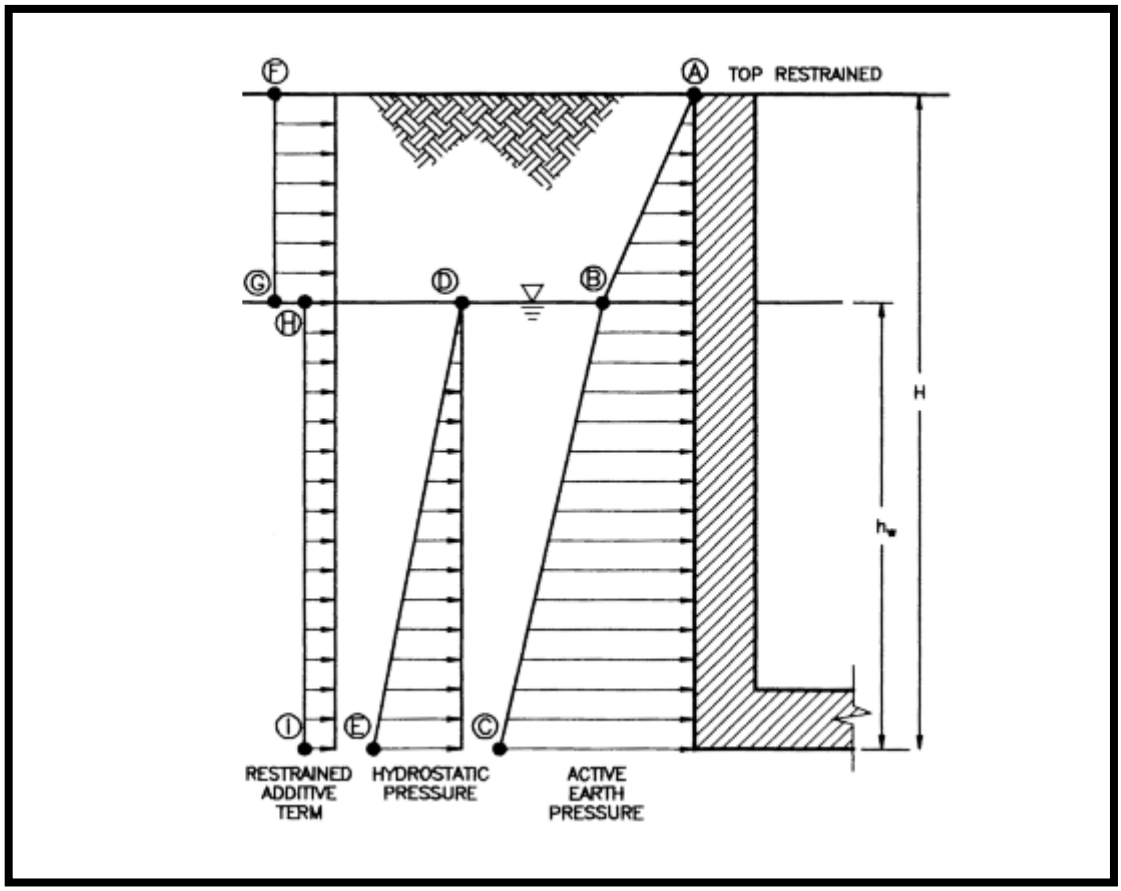
Hydrostatic Pressure

Ⓓ = 0

Ⓔ = $62.4h_w$

LATERAL PRESSURES FOR CANTILEVER WALLS
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 3



NOTES

H = wall height in feet

h_w = water height above bottom of structure in feet

Lateral pressure values presented herein are based on the assumption that non-expansive backfill materials will be used to backfill behind walls

LATERAL PRESSURES

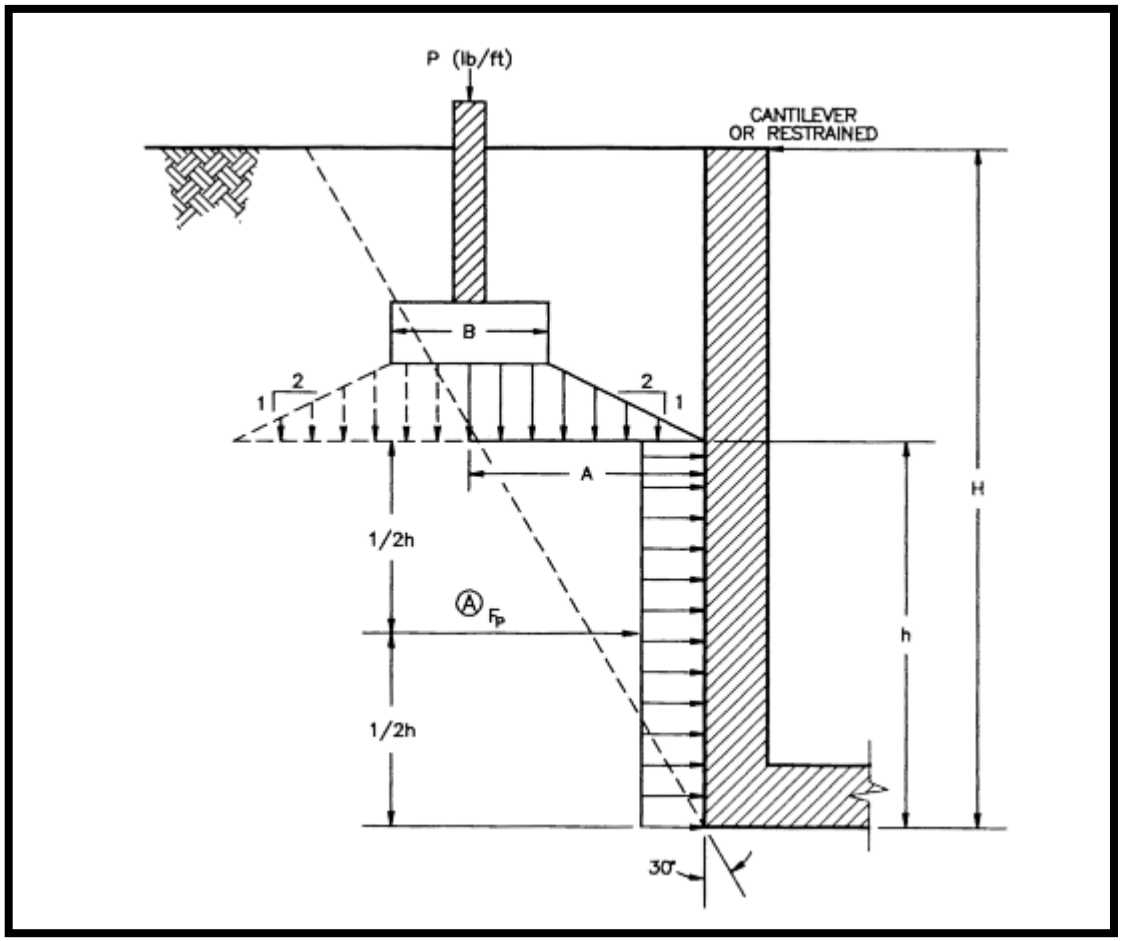
Earth Pressure
Ⓐ = 0
Ⓑ = 35 (H-h_w), psf
Ⓒ = 35 (H-h_w) + 20h_w, psf

Hydrostatic Pressure
Ⓓ = 0
Ⓔ = 62.4h_w

Restrained Additive Term
Ⓕ =Ⓖ= 10H, psf
Ⓗ=Ⓘ= 5H, psf

LATERAL PRESSURES FOR RESTRAINED WALLS
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 4



NON-EXPANSIVE BACKFILL

$F_p = M (A/B) P$, lb/ft

$A = h \tan 30^o$, ft
M = 0.3 for cantilever wall
M = 0.4 for restrained wall

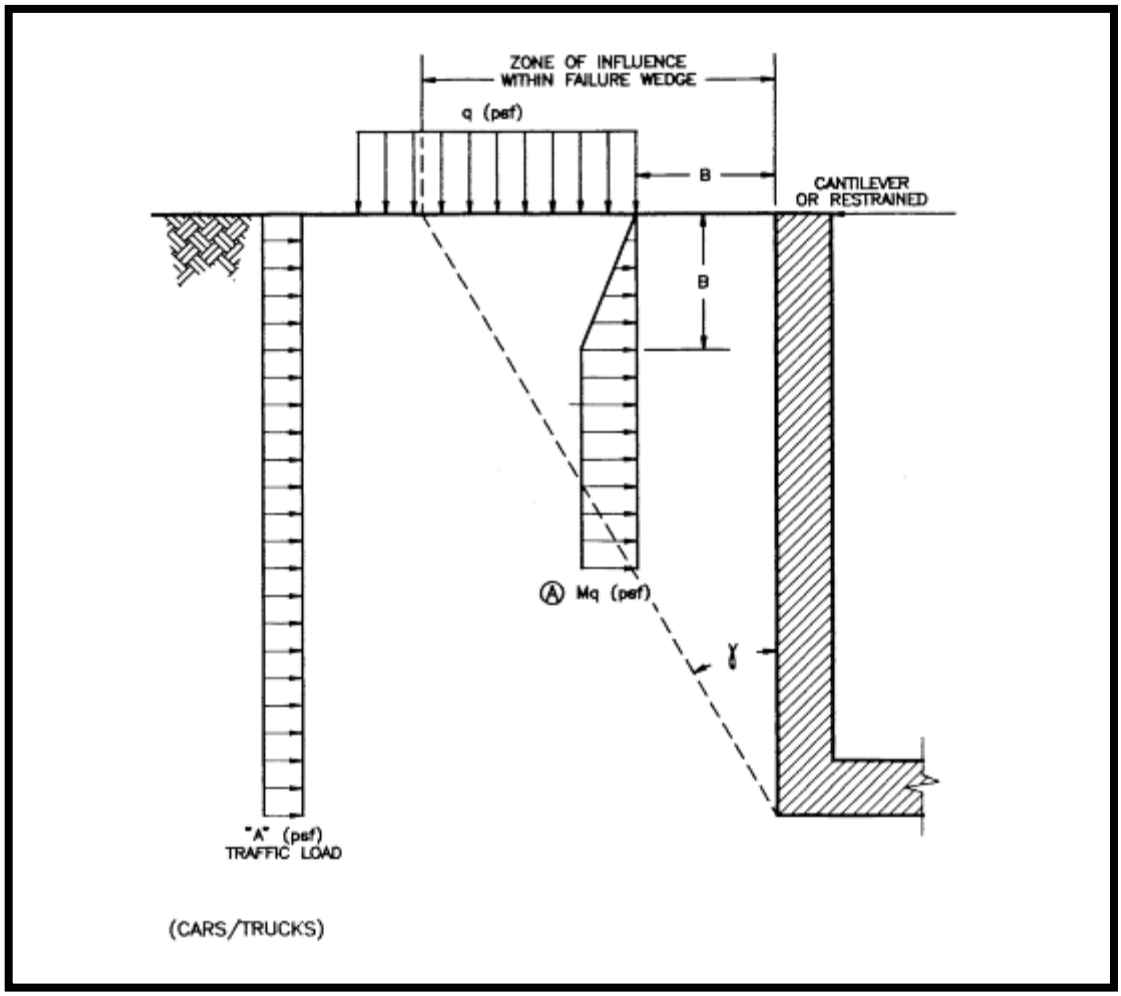
NOTES:

1. Surcharge pressure acting on wall is not affected by groundwater elevation.

2. Surcharge pressures shown are applicable for continuous footing only. Spread footings need to be evaluated individually.

FOUNDATION INDUCED WALL PRESSURES
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 5



NON-EXPANSIVE BACKFILL

q = surcharge load (psf)
B = distance between wall and surcharge load, ft
M = 0.3 for cantilever wall
M = 0.4 for restrained wall
Ⓐ = Mq, psf
"A" = 75 psf
$\gamma = 30^{o}$

NOTE: Surcharge pressure acting on wall is not affected by groundwater elevation.

TRAFFIC AND SURCHARGE PRESSURES
CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE 6

APPENDIX A

FIELD EXPLORATION PROGRAM

APPENDIX A

FIELD EXPLORATION PROGRAM

The field exploration program for this project was performed on September 22 and 23, 2016, and included the performance of a total of four (4) soil borings at the approximate locations shown on Figure 1. The borings were advanced to depths ranging between 5.5 feet and 14 feet below the existing ground surface (bgs) using conventional hollow-stem auger drilling methods. The borings were performed with a CME 95 truck-mounted drill rig. The soil and rock types encountered in the borings were visually classified and logged by a field geologist from our firm. A Key to Logs is presented on Figure A-1 through A-2, and logs of the borings are presented on Figures A-3 through A-6.

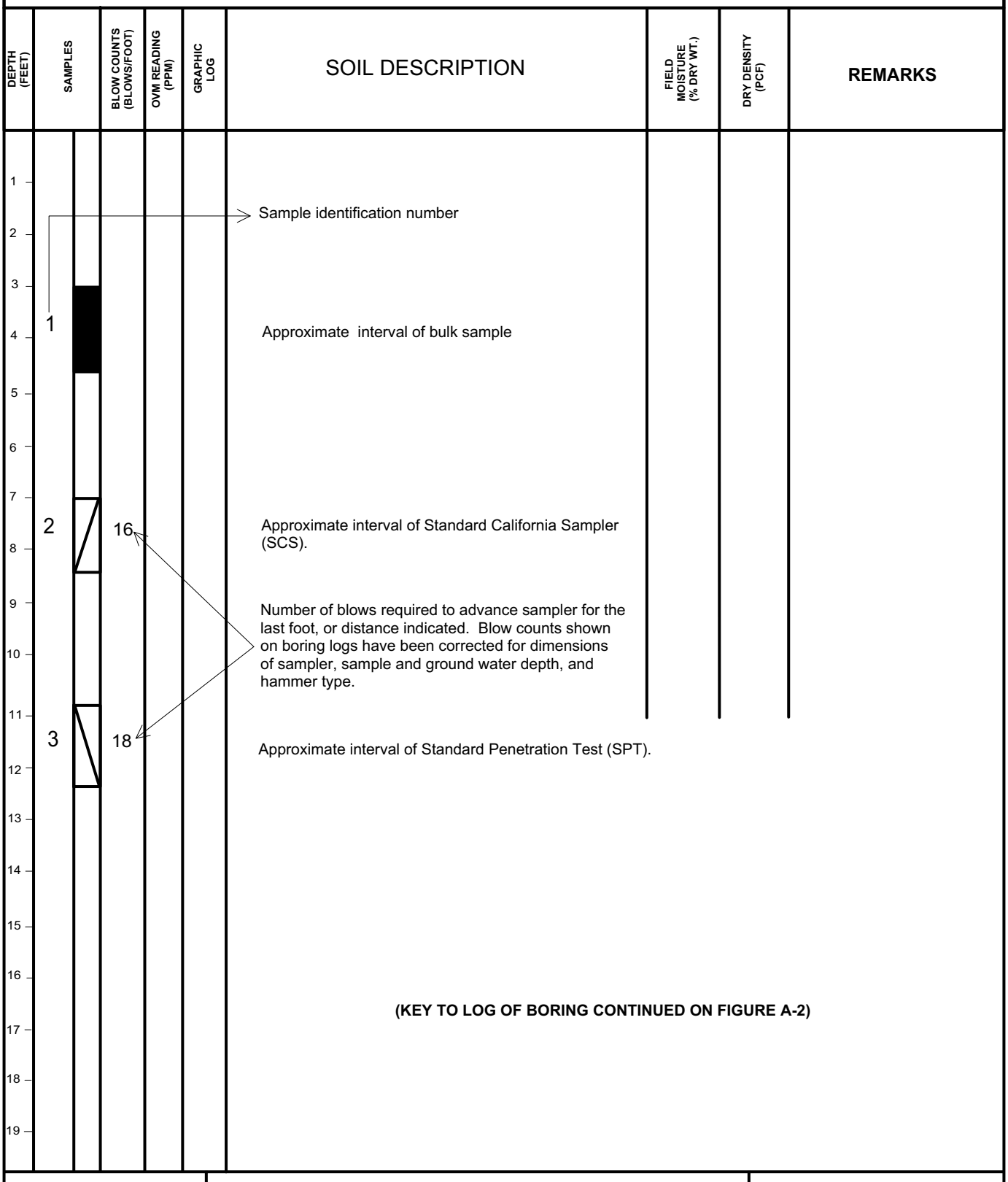
Prior to commencement of the field exploration activities, several site visits were performed to observe existing conditions and to select suitable locations for the borings. Subsequently, Underground Service Alert (USA) was contacted to coordinate clearance of the proposed boring locations with respect to existing buried utilities. Traffic control permits were obtained from the City of Vista to perform the borings.

During drilling, Standard Penetration Tests (SPT) were performed at selected depth intervals. The SPT tests involve the use of a specially manufactured "split spoon" sampler which is driven into the soils at the bottom of the borehole by dropping a 140-pound weight from a height of 30 inches. The number of blows required to penetrate each 6-inch increment was counted and recorded on the field logs, and have been used to evaluate the relative density and consistency of the materials. The blow counts were subsequently corrected for sample type, hammer model, groundwater and surcharge. The corrected blow counts are shown on the boring logs.

Relatively undisturbed samples were obtained by driving a 3-inch (OD) diameter standard California sampler with a special cutting tip and inside lining of thin brass rings into the soils at the bottom of the borehole. The sampler is driven a distance of 12 inches into the soils at the bottom of the borehole by dropping a 140-pound weight from a height of 30 inches. A 6-inch long section of the soil samples that were retained in the brass rings were extracted from the sampling tube and transported to our laboratory in close-fitting, waterproof containers. The samples were field screened for the presence of volatile organics using a RAE Systems MiniRAE 3000 organic vapor meter (OVM). The OVM readings are indicated on the boring logs.

Following completion of the drilling and sampling activities, the borings were backfilled using bentonite chips mixed with the soil cuttings generated from the drilling operations to approximately 12 inches below the ground surface. Borings B-1, B-2 and B-3 which were performed in dirt shoulders were capped with soil cuttings. Boring B-4 was capped with hot-mix asphalt to match the adjacent pavement surface. Excess soil cuttings from the drilling operations were removed from the site.

KEY TO LOG OF BORING



(KEY TO LOG OF BORING CONTINUED ON FIGURE A-2)

PROJECT NO. 11D4-A	**ALLIED GEOTECHNICAL ENGINEERS, INC.**	**FIGURE A-1**

KEY TO LOG OF BORING (CONTINUED)

DEPTH (FEET)	SAMPLES	BLOW COUNTS (BLOWS/FOOT)	OVM READING (PPM)	GRAPHIC LOG	SOIL DESCRIPTION	FIELD MOISTURE (% DRY WT.)	DRY DENSITY (PCF)	REMARKS
1					–?- —— —?– APPROXIMATE GEOLOGIC CONTACT			
2					FILL			
3					SAND			
4					SILT			
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

GENERAL NOTES

1. Approximate elevation and location of borings is based on GoogleEarth 2016.
2. Soil descriptions are based on visual classification made during the field exploration and, where deemed appropriate, have been modified based on the results of laboratory tests.
3. Descriptions on the boring logs apply only at the specific boring locations and at the time the borings were performed. They are not warranted to be representative of subsurface conditions at other locations or times.

BORING NO. B-1

DATE OF DRILLING: SEPTEMBER 22, 2016 | TOTAL BORING DEPTH: 5.5 FEET

GENERAL LOCATION: EAST SHOULDER OF ORANGE GROVE AVENUE, APPROXIMATELY 180 FEET NORTH OF CRESCENT DRIVE

APPROXIMATE SURFACE ELEV.: +425 FEET MSL | DRILLING CONTRACTOR: TRI-COUNTY DRILLING. INC..

DRILLING METHOD: 8 INCH HSA | LOGGED BY: NICK BARNES

DEPTH (FEET)	SAMPLES	BLOW COUNTS BLOWS/FOOT	OVM READING (PPM)	GRAPHIC LOG	SOIL DESCRIPTION	FIELD MOISTURE % DRY WT.	DRY DENSITY LBS./CU. FT.	REMARKS
1					**FILL -** Yellowish brown, damp, silty sand (SM).			
2					**GREEN VALLEY TONALITE**			
3					Yellowish brown to strong brown, damp, very dense, silty sand (SM). Rock is moderately to highly weathered.			
4	1							
5	2	100						No sample recovery

NOTES:

Refusal at 5.5 feet on slightly weathered bedrock.

No groundwater or seepage encountered during drilling operations.

BORING NO. B-2

DATE OF DRILLING: SEPTEMBER 22, 2016 | TOTAL BORING DEPTH: 5.5 FEET

GENERAL LOCATION: NORTH SHOULDER OF CRESCENT DRIVE APPROXIMATELY 95 FEET EAST OF ORANGE GROVE AVENUE

APPROXIMATE SURFACE ELEV.: +418 FEET MSL | DRILLING CONTRACTOR: TRI-COUNTY DRILLING. INC..

DRILLING METHOD: 8 INCH HSA | LOGGED BY: NICK BARNES

DEPTH (FEET)	SAMPLES	BLOW COUNTS BLOWS/FOOT	OVM READING (PPM)	GRAPHIC LOG	SOIL DESCRIPTION	FIELD MOISTURE % DRY WT.	DRY DENSITY LBS./CU. FT.	REMARKS
1					**FILL -** Yellowish brown, damp, silty sand (SM).			
2					**GREEN VALLEY TONALITE**			
3					Yellowish brown to strong brown, damp, very dense, silty sand (SM). Rock is moderately to highly weathered.			
4	1							
5	2	100+	0.0			2.8		

NOTES:

Refusal at 5.5 feet on slightly weathered bedrock.

No groundwater or seepage encountered during drilling operations.

BORING NO. B-3

DATE OF DRILLING: SEPTEMBER 22, 2016 | TOTAL BORING DEPTH: 7 FEET

GENERAL LOCATION: NORTH SHOULDER OF CRESCENT DRIVE APPROXIMATELY 60 FEET WEST OF AVALON DRIVE

APPROXIMATE SURFACE ELEV.: +420 FEET MSL | DRILLING CONTRACTOR: TRI-COUNTY DRILLING. INC..

DRILLING METHOD: 8 INCH HSA | LOGGED BY: NICK BARNES

DEPTH (FEET)	SAMPLES	BLOW COUNTS BLOWS/FOOT	OVM READING (PPM)	GRAPHIC LOG	SOIL DESCRIPTION	FIELD MOISTURE % DRY WT.	DRY DENSITY LBS./CU. FT.	REMARKS
1				?	**FILL -** Yellowish red to strong brown, damp, silty sand (SM).			?
2					?			
3	1				**GREEN VALLEY TONALITE**			
4	2				Yellowish brown to reddish yellow, damp, very dense, silty sand (SM). Rock is moderately to highly weathered.			
5	3	75	0.0			3.9	107.6	
6								
7								

NOTES:

Refusal at 7 feet on slightly weathered bedrock.

No groundwater or seepage encountered during drilling operations.

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE A-4

BORING NO. B-4

DATE OF DRILLING: SEPTEMBER 23, 2016	TOTAL BORING DEPTH: 14 FEET
GENERAL LOCATION: EAST SIDE OF AVALON DRIVE, APPROXIMATELY 175 FEET NORTH OF CRESCENT DRIVE	
APPROXIMATE SURFACE ELEV.: +438 FEET MSL	DRILLING CONTRACTOR: TRI-COUNTY DRILLING. INC..
DRILLING METHOD: 8 INCH HSA	LOGGED BY: NICK BARNES

DEPTH (FEET)	SAMPLES	BLOW COUNTS BLOWS/FOOT	OVM READING (PPM)	GRAPHIC LOG	SOIL DESCRIPTION	FIELD MOISTURE % DRY WT.	DRY DENSITY LBS./CU. FT.	REMARKS
					EXISTING PAVEMENT: 4" A.C. and no base.			
1–2					**FILL** Yellowish brown to strong brown, damp, silty sand (SM).			
3	1			?	? ?			?
4–6	2	100+			**GREEN VALLEY TONALITE** Yellowish brown to olive brown, damp, very dense, silty sand (SM). Rock is fine to medium-grained, and moderately to highly weathered.			No sample recovery
7–9	3							
10	4	75	0.0			2.5		
11–14								

NOTES:

Refusal at 14 feet on slightly weathered bedrock.

No groundwater or seepage encountered during drilling operations.

PROJECT NO. 11D4-A	**ALLIED GEOTECHNICAL ENGINEERS, INC.**	**FIGURE A-5**

APPENDIX B

LABORATORY TESTING

APPENDIX B

LABORATORY TESTING

Selected soil samples were tested in the laboratory to verify visual field classifications and to evaluate certain engineering characteristics. The testing was performed in accordance with the American Society for Testing and Materials (ASTM) or other generally accepted test methods, and included the following:

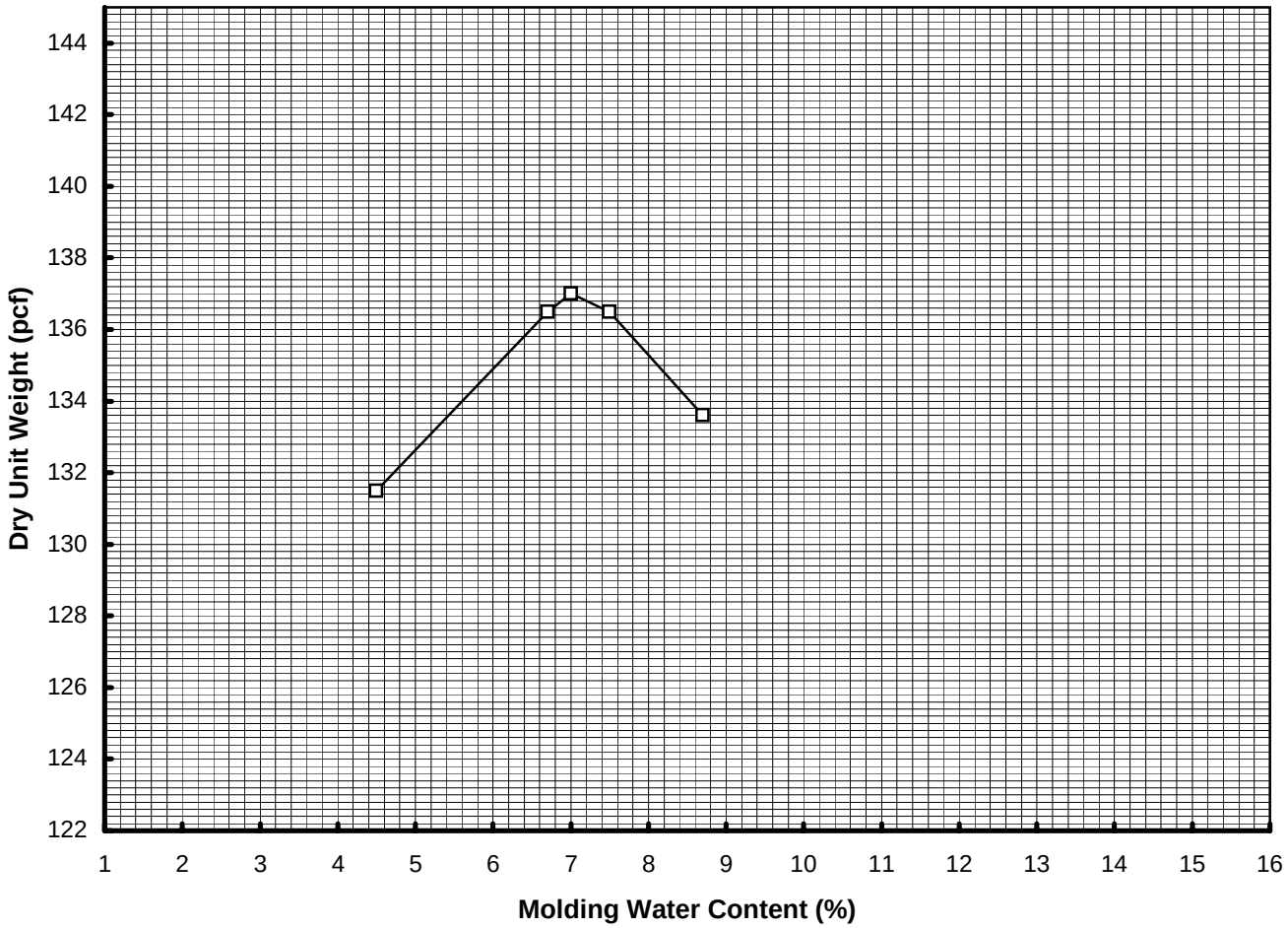
- Determination of in-place moisture content (ASTM D2216). The final test results are presented on the boring logs;
- Determination of in-place dry density and moisture content (ASTM D2937) based on relatively undisturbed drive samples. The final test results are presented on the boring logs;
- Maximum density and optimum moisture content (ASTM D1557). The final test results are presented on Figure B-1; and
- Sieve analyses (ASTM D422). The final test results are plotted as gradation curves on Figure B-2.

In addition, representative samples of the onsite soil materials were delivered to Clarkson Laboratory and Supply, Inc. for analytical (chemical) testing to determine soil pH and resistivity, soluble sulfate and chloride concentrations, and bicarbonate content. Copies of Clarkson's laboratory test data reports are included herein.

COMPACTION CURVE

Test Method: ASTM D 1557

Compaction Procedure: [B] Specimen Preparation Method: [X] Moist or [ ] Dry



5

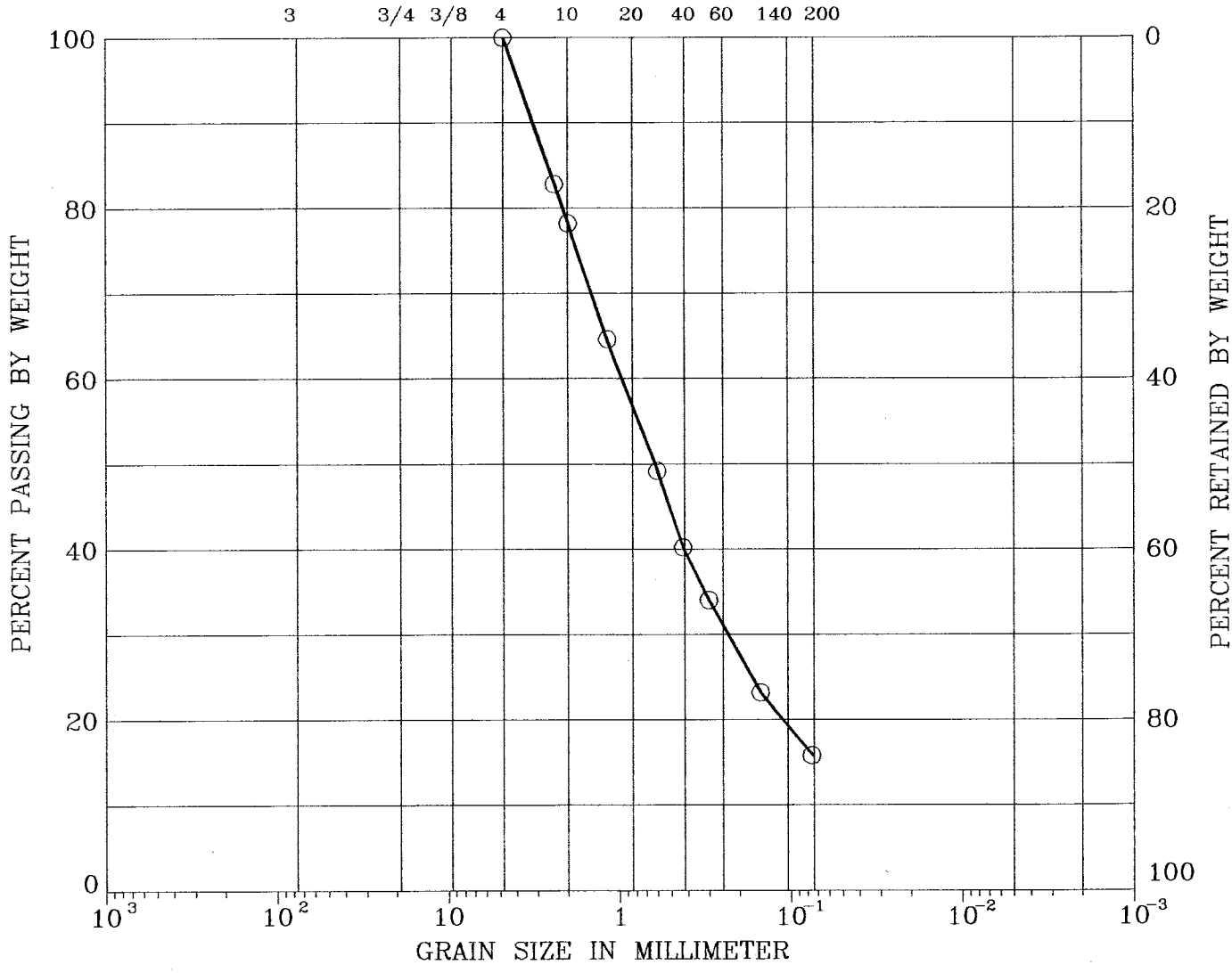
Sample I.D.	Sample Type	Depth (ft)	OPT. WC (%)	MAX. DUW (pcf)	LL	PI	Description and/or Classification
B-7 #1	Bulk	2-4	7.0	137.0			Olive Silty Sand

CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)
CITY OF SAN DIEGO

PROJECT NO. 11D4-A	ALLIED GEOTECHNICAL ENGINEERS, INC.	FIGURE B-1

UNIFIED SOIL CLASSIFICATION

COBBLES	*GRAVEL*		*SAND*			*SILT OR CLAY*
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
○	B-3#2	6-9			SILTY SAND

Remark :

Project 11D4-B	CRESCENT DRIVE SEWER IMPROVEMENTS (CIP 8286)
ALLIED GEOTECHNICAL ENGINEERS, INC.	GRAIN SIZE DISTRIBUTION Figure B-2

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: October 6, 2016
Purchase Order Number: 11D4
Sales Order Number: 32966
Account Number: ALLG
To:

Allied Geotechnical Engineers
1810 Gillespie Way Ste 104
El Cajon, CA 92020
Attention: Sani Sutanto

Laboratory Number: SO6157-3 Customers Phone: 449-5900
Fax: 449-5902
Sample Designation:

One soil sample received on 10/03/16 at 9:20am,
taken on 10/03/16 from Delpy Ditch Sewer Replacement
Project No. 11D4 marked as B-2 #1 @ 4'-5'

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.4

Water Added (ml)	Resistivity (ohm-cm)
10	4500
5	2800
5	2000
5	1800
5	1600
5	1900
5	2100

37 years to perforation for a 16 gauge metal culvert.
48 years to perforation for a 14 gauge metal culvert.
67 years to perforation for a 12 gauge metal culvert.
85 years to perforation for a 10 gauge metal culvert.
104 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.008% (78 ppm)

Water Soluble Chloride Calif. Test 422 0.006% (64 ppm)

Bicarbonate (as $CaCO_3$) 10 ppm
(In a 1:3 water extraction)

Laura Torres
LT/dbb

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: October 6, 2016
Purchase Order Number: 11D4
Sales Order Number: 32966
Account Number: ALLG
To:

Allied Geotechnical Engineers
1810 Gillespie Way Ste 104
El Cajon, CA 92020
Attention: Sani Sutanto

Laboratory Number: SO6157-4 Customers Phone: 449-5900
Fax: 449-5902
Sample Designation:

One soil sample received on 10/03/16 at 9:20am,
taken on 10/03/16 from Delpy Ditch Sewer Replacement
Project No. 11D4 marked as B-4 #1 @ 3'-4'

Analysis By California Test 643, 1999, Department of Transportation Division of Construction, Method for Estimating the Service Life of Steel Culverts.

pH 8.6

Water Added (ml)	Resistivity (ohm-cm)
10	7500
5	5800
5	4800
5	4500
5	4300
5	4500
5	4800

56 years to perforation for a 16 gauge metal culvert.
72 years to perforation for a 14 gauge metal culvert.
100 years to perforation for a 12 gauge metal culvert.
128 years to perforation for a 10 gauge metal culvert.
156 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.003% (27 ppm)

Water Soluble Chloride Calif. Test 422 0.001% (11 ppm)

Bicarbonate (as $CaCO_3$) 20 ppm
(In a 1:3 water extraction)

Laura Torres
LT/dbb

Appendix C

Noise Technical Report

HELIX
Environmental Planning

Crescent Drive Sewer Improvements Project

Noise Technical Report

January 2020 | KEH-01

Prepared for:

KEH and Associates
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Prepared by:

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

Crescent Drive Sewer Improvements Project

Noise Technical Report

Prepared for:

KEH and Associates
570 Rancheros Drive, Suite 200
San Marcos, CA 92069

Prepared by:

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

January 2020 | KEH-01

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
CEQA	California Environmental Quality Act
City	City of Vista
County	County of San Diego
CNEL	Community Noise Equivalent Level
CSMP	Comprehensive Sewer Master Plan
dB	decibel
dBA	A-weighted decibels
Hz	Hertz
in/sec	inches per second
kHz	kilohertz
L_{DN}	Day-Night level
L_{EQ}	equivalent sound level
L_{MAX}	maximum noise level
mPa	micro-Pascals
NSLU	noise-sensitive land use
PPV	peak particle velocity
PVC	polyvinylchloride
RCNM	Roadway Construction Noise Model
SPEIR	Supplemental Program Environmental Impact Report
SPL	sound pressure level
USDOT	U.S. Department of Transportation
VCP	vitrified clay pipe

This page intentionally left blank

EXECUTIVE SUMMARY

This report presents an assessment of potential construction noise impacts associated with the Crescent Drive Sewer Improvements Project (project). The project is located within the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties in the city of Vista. The project consists of abandoning 450 feet of existing 6-inch vitrified clay pipe (VCP) sewer and installing 712 feet of new 8-inch polyvinylchloride (PVC) pipe and would install and connect 11 new 4-inch sewer laterals from private properties to the new sewer pipeline.

The analysis within this report tiers from the 2017 Comprehensive Sewer Master Plan Final Supplemental Program Environmental Impact Report.

Anticipated construction would generate elevated noise levels for nearby residences along the project alignment. With the project's use of temporary noise barriers for the use of a concrete saw and through implementation of the mitigation measure NV-1 of the 2017 Comprehensive Sewer Master Plan Final Supplemental Program Environmental Impact Report, noise levels from construction would not exceed the noise limits set by the City and impacts would be less than significant. Ground-borne vibration generated during construction would be minimal and would not affect nearby residences.

During construction, the project would minor add traffic to nearby roadways, but transportation noise impacts to off-site land uses would be less than significant.

Noise generated during the project's occasional operational maintenance would be insubstantial and would not exceed noise limits set by the City.

Based on the distances from the project site to the nearest airports, no effects related to airport noise would occur at the project site.

This page intentionally left blank

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential noise and vibration impacts associated with the proposed Crescent Drive Sewer Improvements Project (project). The analysis includes a description of existing conditions in the project vicinity and an assessment of potential impacts associated with project construction. Analysis within this report tiers from the 2017 Comprehensive Sewer Master Plan (CSMP) Final Supplemental Program Environmental Impact Report (SPEIR; City of Vista 2017) that was certified in October 2017.

1.2 PROJECT LOCATION

The project is located within the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties in the city of Vista. See Figure 1, *Regional Location*, and Figure 2, *Aerial Photograph*.

1.3 PROJECT DESCRIPTION

The project consists of abandoning 450 feet of existing 6-inch vitrified clay pipe (VCP) sewer and installing 712 feet of new 8-inch polyvinylchloride (PVC) pipe within the public rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way. The existing VCP sewer is located in an easement that runs along the northern portions of multiple private properties on Crescent Drive, which presents maintenance challenges and creates substantial disturbance for the residents located along the sewer alignment. The project would require the installation and connection of 11 new 4-inch sewer laterals from private properties to the new sewer pipeline.

Project construction would involve trenching, installing the new pipeline, backfilling, and repaving affected portions of the street and private properties. Construction activities would occur in the rights-of-way of Crescent Drive, Avalon Drive, and Sabrina Way, as well as within multiple private residential properties zoned R-1B (Single Family Residential). The existing sewer main and manholes would be protected in place until the new sewer is tested, approved, and placed into service. All existing landscaping and hardscaping that conflicts with the installation or proper function of the proposed improvements would be removed, and/or relocated upon installation of the proposed sewer main and laterals.

The project would require trenching excavation activities requiring the use of a concrete saw. A temporary moveable 6-foot noise barrier would be utilized between the concrete saw and residences for the duration that the concrete saw is within 120 feet of residences. The temporary barriers used would be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps through or below the wall. Any seams or cracks would be filled or caulked. If wood is used, it would be tongue and groove or close butted seams and would be at least 3/4-inch thick or have a surface density of at least 3.5 pounds per square foot.

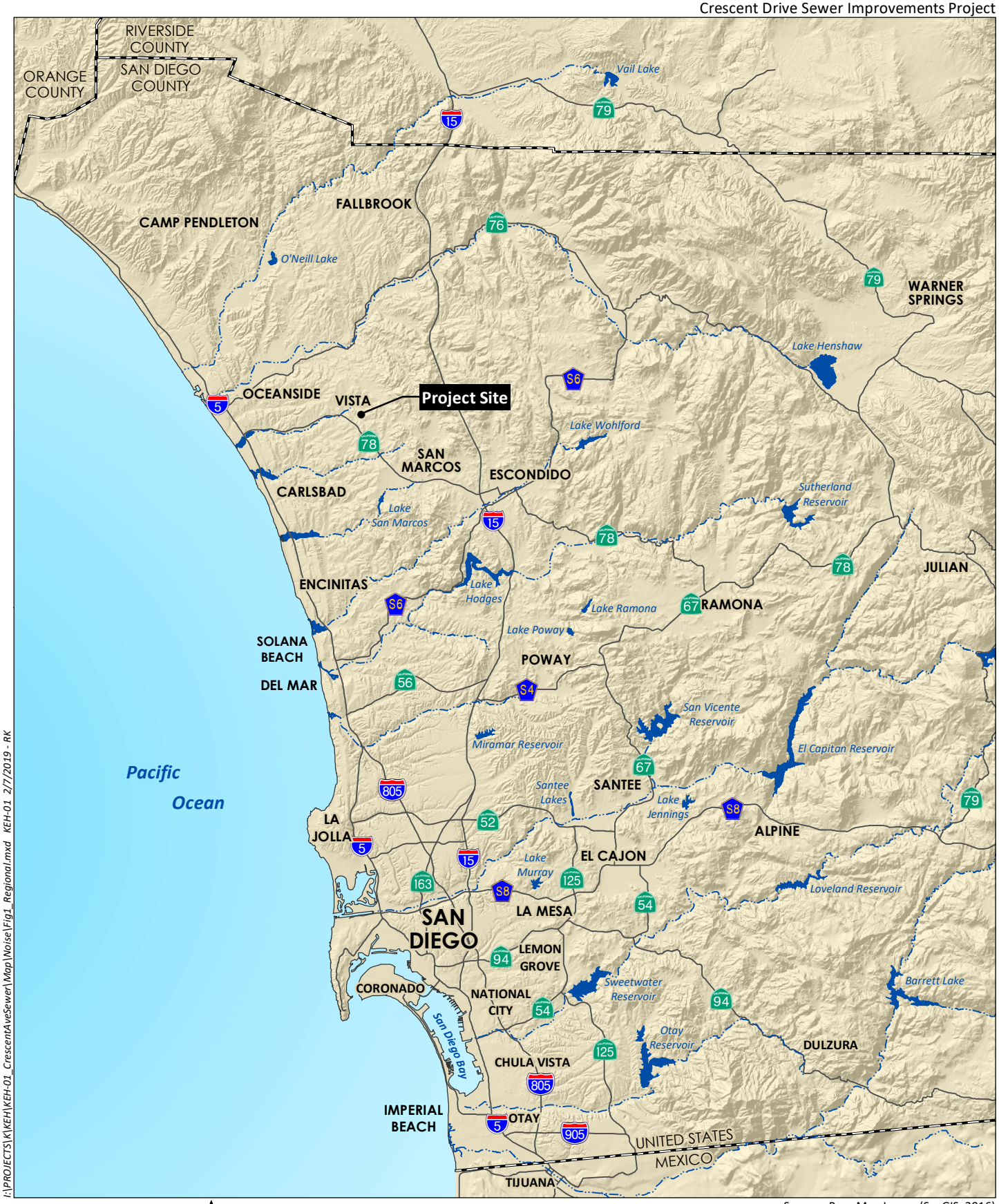
1.4 IMPACTS AND MITIGATION MEASURES IDENTIFIED IN THE SPEIR

The SPEIR identified potentially significant impacts associated with construction noise and implemented mitigation measure NV-1 to reduce construction-related noise impacts to a less-than-significant level

(refer to Appendix A, Mitigation, Monitoring, and Reporting Program, of the CSMP Final SPEIR). Mitigation measure NV-1 would be implemented as part of the proposed project, as applicable.

NV-1 **Construction Noise Reduction Measures.** The Construction Contractor shall demonstrate to the satisfaction of the City Engineer that the following noise control techniques are implemented during the clearing, demolition, grading and construction phases of projects identified in the 2017 CSMP within 200 feet of noise-sensitive land uses.

- Heavy equipment repair and contractor staging shall be conducted at sites as far as practical from nearby residences.
- Construction equipment, including vehicles, generators and compressors, shall be maintained in proper operating condition and shall be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, acoustical lagging, and/or engine enclosures).
- Temporary sound barriers (or curtains), stockpiles of excavated materials, or other effective shielding or enclosure techniques shall be used where construction noise would exceed 90 dBA within less than 50 feet from a noise sensitive receptor.
- Construction work, including on-site equipment maintenance and repair, shall be limited to the hours specified in the noise ordinance of the affected jurisdiction(s).
- Electrical power shall be supplied from commercial power supply, wherever feasible, in order to avoid or minimize the use of engine-driven generators.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible.
- Unnecessary idling of internal combustion engines (i.e., in excess of five minutes) shall be prohibited.
- Operating equipment shall be designed to comply with all applicable local, state, and federal noise regulations.
- Construction site and access road speed limits shall be established and enforced during the construction period.
- If lighted traffic control devices are to be located within 500 feet of residences, the devices shall be powered by batteries, solar power, or similar sources, and not by an internal combustion engine.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- No project-related public address or music system shall be audible at any adjacent sensitive receptor.
- The construction contractors shall provide advance notice, between 2 and 4 weeks prior to construction, by mail to all residents or property owners within 200 feet of the



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Noise\Fig1_RegionalLmxd KEH-01 2/7/2019 - RK

0 8 Miles

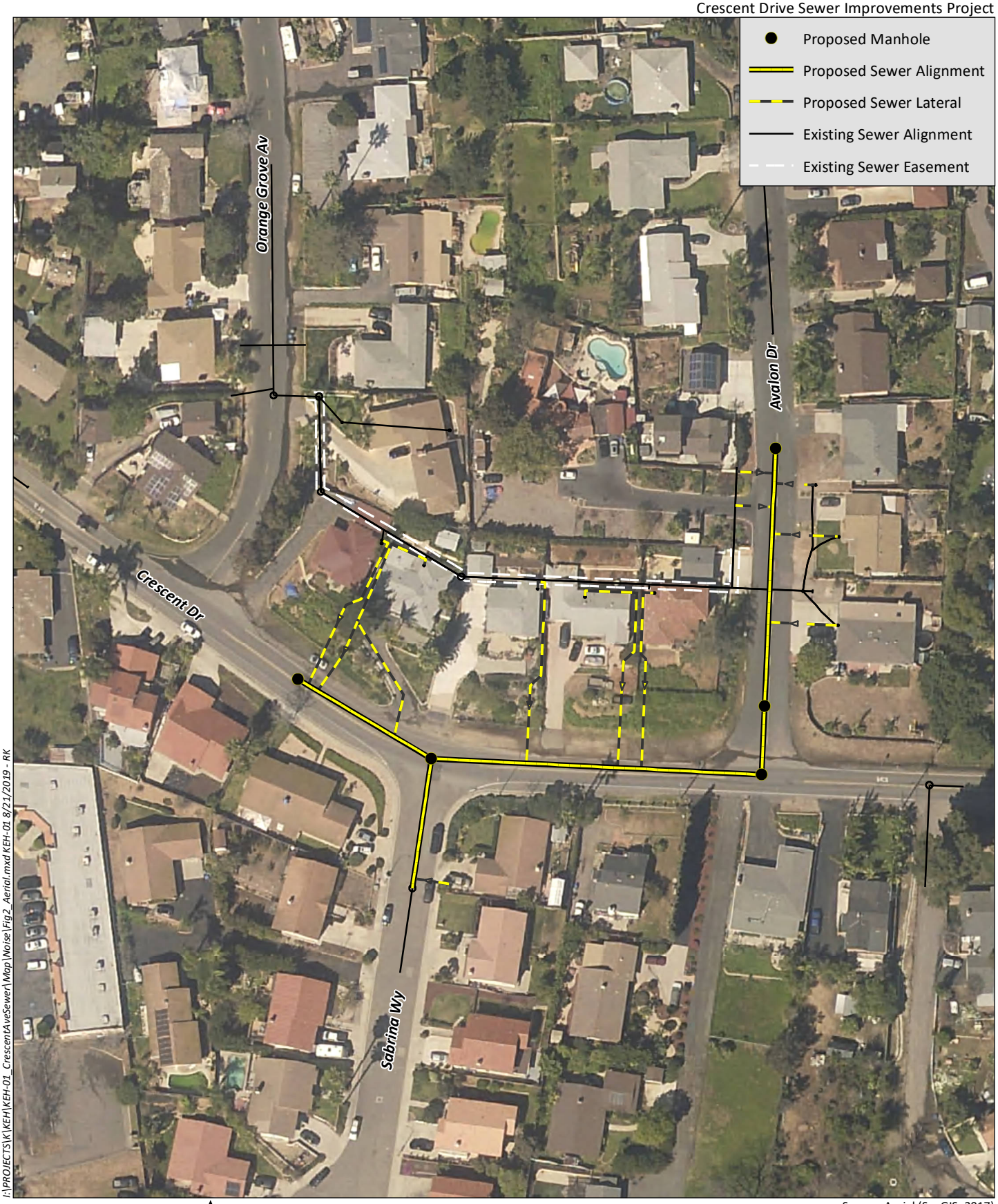
Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1

Crescent Drive Sewer Improvements Project



I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Noise\Fig2_Aerial.mxd KEH-01 8/21/2019 - RK

0 100 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Aerial Photograph

Figure 2

alignment. The announcement shall state specifically where and when construction will occur in the area. If construction delays more than seven days occur, an additional notice shall be made, either in person or by mail. The City shall publish a notice of impending construction on the City website, stating when and where construction will occur.

- The construction contractors shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise and other construction disturbance. The construction contractors shall also establish a program for receiving questions or complaints during construction and develop procedures for responding to callers. Procedures for reaching the public liaison officer via telephone or in person shall be included in notices distributed to the public is accordance with the information above.

1.5 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

1.5.1 Descriptors

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

1.5.2 Terminology

1.5.2.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

1.5.2.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes

more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this wide range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 mPa.

1.5.2.3 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than from one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

No known studies have directly correlated the ability of a healthy human ear to discern specific levels of change in traffic noise over a 24-hour period. Many ordinances, however, specify a change of 3 dBA CNEL as the significant impact threshold. This is based on the concept of a doubling in noise energy resulting in a 3 dBA change in noise, which is the amount of change in noise necessary for the increase to be perceptible to the average healthy human ear.

1.6 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors are individual locations that may be affected by noise. NSLUs in the project vicinity are single-family residences immediately adjacent the project alignment.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2006) are considered “vibration-sensitive.” The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive

levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Vibration-sensitive land uses in the project area include the adjacent single-family residences.

1.7 REGULATORY FRAMEWORK

1.7.1 California Noise Control Act

The California Noise Control Act is a section within the California Health and Safety Code that describes excessive noise as a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

1.7.2 California Noise Insulation Standards [California's Title 24 Noise Standards, Cal. Adm. Code Title 24, Chap. 2-35]

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for multi-family residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior dBA CNEL (or L_{DN}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior dBA CNEL (or L_{DN}) of at least 45 dBA.

1.7.3 City of Vista General Plan, Noise Element

The Noise Element of the City's General Plan includes a noise/land use compatibility matrix for assessing the suitability of different categories of planned land uses based on exterior noise level exposure (Table NE-3 from the City General Plan). For the project's land use (Commercial Neighborhood), the Noise Element specifies exterior noise levels up to 65 dBA CNEL as normally acceptable and up to 75 dBA CNEL is conditionally acceptable. Noise levels exceeding 75 dBA CNEL are generally unacceptable for commercial neighborhood uses.

In addition, the City defines specific maximum noise levels that shall not be exceeded for both interior and exterior use areas. A proposed project shall not generate noise levels that exceed these standards. The City extends the provisions of the State of California Noise Insulation Standards (Title 24), limiting interior noise levels to 45 dBA CNEL for multi-family residential development. Table 1, *Interior and Exterior Noise Guidelines*, provides limits for various types of land uses.

Table 1
INTERIOR AND EXTERIOR NOISE GUIDELINES

Land Use	Maximum Noise Level (L_{DN} or CNEL, dBA)	
	Interior[1,2]	Exterior
Residential – Single Family, Multi-family, Duplex	45	65[3]
Residential – Nursing Homes, Hospital	45	65[3]
Private Offices, Church Sanctuaries, Libraries, Board Rooms, Conference Rooms, Theaters, Auditoriums, Concert Halls, Meeting Halls, etc.	45	-
Schools	45	65[4]
General Offices, Reception, Clerical, etc.	50	-
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	60	-
Manufacturing, Kitchen, Warehousing, etc.	65	-
Parks, Playgrounds, etc.	-	65[4]
Golf Courses, Outdoor Spectator Sports, Amusement Parks, etc.	-	70[4]

Notes:

[1] Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.

[2] Indoor environment excluding bathrooms, toilets, closets, and corridors.

[3] Outdoor environment limited to rear yard of single-family homes, multi-family patios and balconies (with a depth of 6 feet or more) and common recreation areas.

[4] Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.

L_{DN}=Day-Night Level; CNEL=Community Noise Equivalent Level; dBA=A-weighted decibel

1.7.4 City of Vista Noise Ordinance (Municipal Code, Chapter 8.32, Noise Control)

Sections 8.32.010 through 8.32.060 of the City of Vista Municipal Code pertain to City noise requirements and enforcement of violations. The City has adopted the County of San Diego (County) Noise Ordinance for the purpose of controlling excessive noise levels, including noise from construction activities.

Table 2, *Applicable Exterior Property Line Noise Limits,* lists the applicable exterior property line noise limits. This table is specific to the City of Vista and replaces the table in Section 36.404 of the County noise ordinance. It is unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level at any point on or beyond the boundaries of the property exceeds these limits. The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones.

Table 2
APPLICABLE EXTERIOR PROPERTY LINE NOISE LIMITS

Zone	Time	Applicable Limit One-hour Average Sound Level (decibels)
A-1, E-1, O, OSR	7:00 a.m. – 10:00 p. m.	50
R-1B, MHP	10:00 p.m. – 7:00 a. m.	45
R-M	7:00 a.m. – 10:00 p.m.	55
	10:00 p.m. – 7:00 a.m.	50
C-1, C-2, O-3, C-T, OP, M-U and Downtown Specific Plan	7:00 a.m. – 10:00 p.m.	60
	10:00 p.m. – 7:00 a.m.	55
M-1, I-P, all areas of the Vista Business Park Specific Plan and Specific Plan 14	Any time	70

Source: City of Vista Municipal Code Section 8.32.40
A-1 = Agricultural; C-1 = Commercial; C-2 = Commercial; C-T = Commercial Transient; E-1 = Estate; I-P = Industrial; MHP = Mobile Home Park; M-U = Mixed Use; O = Open Space; O-3 = Office Park; OP = Office Professional; OSR = Open Space Residential; R-1B = Single Family Residence (6,000 square feet); R-M = Multi-Residential

The project would occur within public right-of-way and within properties zoned R-1B (Single Family Residential).

The adopted County of San Diego Noise Ordinance also stipulates controlling construction noise. San Diego County Code Sections 36.408 and 36.409, Construction Equipment, state that, except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

A. Between 7:00 p.m. and 7:00 a.m.

B. On Sunday or a holiday. For the purposes of this section, a holiday means January 1, the last Monday in May, July 4, the first Monday in September, December 25, and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence or for the purpose of construction of a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limits in Sections 36.409 and 36.410.

C. Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 dBA for an 8-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410 of the County's ordinance provides additional limitation on construction equipment beyond Section 36.404 pertaining to impulsive noise. Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3*, Maximum Sound Levels (Impulsive)*, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period.

Table 3
MAXIMUM SOUND LEVELS (IMPULSIVE)

Occupied Property Use	Decibels (dBA) L_{MAX}
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

Source: County of San Diego Municipal Code Section 36.410

The minimum measurement period for any measurements is one hour. During the measurement period, a measurement must be conducted every minute from a fixed location on an occupied property. The measurements must measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

2.0 ENVIRONMENTAL SETTING

2.1 SURROUNDING LAND USES

Single family residences immediately surround the project alignment. A commercial/office center is located to the southwest of the alignment, separated from the alignment by a row of single-family residences.

2.2 EXISTING NOISE ENVIRONMENT

The existing noise environment is dominated by vehicular traffic noise on Crescent Drive, as well as, to a lesser extent, vehicular traffic on Civic Center Drive. The project is subject to some distant aircraft noise, though the site is not located near any active airports. The nearest airports are McClellan-Palomar Airport, located five miles to the southwest, Oceanside Municipal Airport, located seven miles to the west, and Marine Corps Air Station Camp Pendleton, located 10 miles to the northwest.

2.2.1 Ambient Noise Survey

One measurement was taken at the project site for the ambient noise survey. The measurement was recorded adjacent to the project alignment along the southern sidewalk of Crescent Drive, west of Sabrina Way (see Figure 3, *Noise Measurement Location*, and Appendix A, *Site Survey Measurement Sheet*, for survey notes). The measured noise level is shown in Table 4, *Noise Measurement Results*.

Crescent Drive Sewer Improvements Project

I:\PROJECTS\K\KEH\KEH-01_CrescentAveSewer\Map\Noise\Fig3_Measurement_Locations.mxd KEH-01 8/21/2019 - RK

0 75 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Noise Measurement Location

Figure 3

Table 4
NOISE MEASUREMENT RESULTS

Measurement 1 - Ambient	
Date:	July 10, 2018
Conditions:	Temperature: 80°F. Wind Speed: 5 mph. 15% humidity. Partly cloudy.
Time:	1:13 p.m. – 1:24 p.m.
Location:	Adjacent to 603 Sabrina Way, on Crescent Drive sidewalk. Coordinates: 33°11'50.75"N, 117°13'57.84"W.
Measured Noise Level:	61.6 dBA L_{EQ}
Notes:	Noise from Crescent Drive is the dominant noise source. Distant traffic noise is from Civic Center Drive. Measurement paused once to speak with neighbor. Most noise is from automobiles passing by.

3.0 ANALYSIS, METHODOLOGY, AND ASSUMPTIONS

3.1 METHODOLOGY

3.1.1 Ambient Noise Survey

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis LXT Noise Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

3.1.2 Noise Modeling Software

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would involve trenching, installing the new pipeline, backfilling, and repaving affected portions of the street. Standard equipment for these is activities is assumed to include a concrete saw, backhoe, and paver. Equipment would not operate simultaneously at a given location. It is assumed for this analysis that equipment would be located in front of a given residence for three hours in a day, based on a typical work rate of 20 feet per hour for the given equipment along a linear alignment.

Based on a street width of approximately 30 feet and additional setback distances to residential properties, construction activities within the rights-of-way are anticipated to occur 30 feet from residential property lines.

Installation of the sewer laterals would partially occur within the property lines of private residences. It is assumed that trenching, pipeline installation, backfilling, and other ground restoration activities within the private property would be conducted with hand tools and not require heavy motorized equipment.

3.3 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines and the thresholds of significance presented in the SPEIR, implementation of the project would result in a significant adverse impact if it would:

Threshold 1: *Temporarily or permanently expose persons to or generate noise levels in excess of standards established in the Vista General Plan or noise ordinance.*

Per the Vista Noise Ordinance, impacts would be significant if the project would generate operational noise levels at a common property line with a residential zone that would exceed the following one-hour average exterior noise levels: 50 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m.

Construction activity would be considered significant for nearby residences if it exceeds an 8-hour average exterior noise level of 75 dBA, or a maximum impulsive noise level of 82 dBA on an occupied residential use. The ordinance prohibits construction and building work between the hours of 7:00 p.m. and 7:00 a.m. of the next day, on Sundays, or on a holiday.

Threshold 2: *Expose persons to or generation of excessive ground-borne vibration or ground-borne noise levels.*

Excessive ground-borne vibration is defined as equal to or in excess of 0.2 inches per second (in/sec) peak particle velocity (PPV).

Threshold 3**:** *For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public use airport or private airstrip, expose people residing or working in the project area to excessive noise*.

Excessive noise exposure is defined as noise levels that exceed the standards in the Vista General Plan Noise Element for the associated land use.

4.0 IMPACTS

4.1 ISSUE 1: EXCESSIVE NOISE LEVELS

Would the project temporarily or permanently expose persons to or generate noise levels in excess of standards established in the City of Vista General Plan or noise ordinance?

4.1.1 Temporary Construction Noise

4.1.1.1 Construction Equipment

The loudest activities associated with pipeline construction would be from a concrete saw cutting existing pavement and from a backhoe digging the trench for the new pipeline. Both activities would occur as close as 30 feet to adjacent residential properties but would not operate simultaneously at a given location. Furthermore, based on a typical work rate of 20 feet per hour for a concrete saw and backhoe along a linear alignment, construction equipment would not be located within 30 feet from a given residence for more than 3.5 hours over the course of an 8-hour workday. For this analysis it is assumed that equipment would operate at an average distance of 50 feet from a given residence over the course of an 8-hour workday. At a distance of 50 feet, a concrete saw would generate a noise level of 82.6 dBA L_{EQ} and a backhoe would generate a noise level of 73.6 dBA L_{EQ}. Use of a backhoe would be in compliance with the applicable noise limit; however, use of a concrete saw would generate noise levels at adjacent residences in excess of the 75 dBA L_{EQ} noise limit. The project would include the use of a temporary moveable 6-foot noise barrier to be utilized between the concrete saw and residences for the duration that the concrete saw is within 120 feet of residences. Impacts from construction equipment would be less than significant. Additionally, mitigation measure NV-1 of the SPEIR (refer to Section 1.4 of this report) would help to minimize construction noise to less than significant levels.

4.1.1.2 Construction Traffic

Project construction would generate vehicle trips associated with material delivery and worker commutes. Due to the limited number of trips and low speeds posted on the residential streets, however, noise generated from construction-related vehicles would be minimal and impacts would be less than significant.

4.1.2 Permanent Operational Noise

Operational noise from the project would be associated with periodic maintenance. The noise generated by on-site maintenance and associated vehicle trips would be infrequent and of short duration and would not be substantially different from existing maintenance and repair activities. In addition, the new sewer line would be located further from the residences on Crescent Drive than where it is currently located, and noise levels associated with operational maintenance activities would likely be reduced at these residential receivers. As such, noise generated by on-site maintenance activities is not anticipated to exceed noise limits for residential properties established in the City's Noise Ordinance and would not expose sensitive receptors to excessive noise. Impacts would be less than significant.

4.2 ISSUE 2: EXCESSIVE VIBRATION

Would the project expose persons to or generate excessive ground-borne vibration or noise levels?

4.2.1 Construction Vibration

Construction activities known to generate excessive ground-borne vibration include pile driving and the use of a vibratory roller for soil compaction. A vibratory roller can generate ground-borne vibration levels of 0.210 in/sec PPV at a distance of 25 feet (Caltrans 2013). Pile driving would not be required for the project and a vibratory roller would not be used due to trench size constraints. A small vibratory plate compactor or tamping rammer would likely be used. These are handheld units and would have no measurable vibration beyond 10 to 15 feet. Other construction equipment to be used would generate substantially less ground-borne vibration; therefore, equipment to be used for project construction would not generate ground-borne vibration levels of 0.2 in/sec PPV or greater at the adjacent residences. Impacts would be less than significant.

4.3 ISSUE 3: AIRPORT NOISE EXPOSURE

Would the project expose people residing or working in the project area to excessive noise from a nearby public use airport or private airstrip?

4.3.1 Airport Noise

The project is subject to some distant aircraft noise, though the site is not located near an active airport. The nearest airports are McClellan-Palomar Airport, located five miles to the southwest, Oceanside Municipal Airport, located seven miles to the west, and Marine Corps Air Station Camp Pendleton, located 10 miles to the northwest. At these distances, no effects related to airport noise would occur at the project site, and impacts would be less than significant.

5.0 LIST OF PREPARERS

Hunter Stapp, Noise Analyst
Charles Terry, Senior Acoustic Specialist
Joanne M. Dramko, AICP, Senior Technical Specialist, QA/QC

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

6.0 REFERENCES

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September.

Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. May.

U.S. Department of Transportation. 2008. Roadway Construction Noise Model.

Vista, City of. 2017. 2017 Comprehensive Sewer Master Plan Final Supplemental Program Environmental Impact Report. October.

2014. City of Vista Municipal Code, Section 8.32, Noise Control. April

2012. City of Vista General Plan, Noise Element.

This page intentionally left blank

Appendix A

Site Survey Measurement Sheet

Site Survey

Job # KEH-01	Project Name: Crescent Dr Sewer		
Date: 7/10/2018	Site #: 1	Engineer: J. Runyan	
Address: Adjacent to 603 Sabrina Way - on Crescent Drive sidewalk			
Meter: LD LXT	Serial #: 1741	Calibrator: CAL250	Serial #: 4371

Notes: Partly Cloudy. Noise from Crescent Drive dominating. Some distant traffic noise @ Civic Ctr. Dr. - Paused once to speak with neighbor. Most noise from auto pass bys.

Sketch:

Temp: 80° F	Wind Spd: ~5 mph	Humidity: 15 %
Start of Measurement: 1313	End of Measurement: 1324	61.6 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

Construction Noise Modeling Outputs

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	89.6	N/A	N/A	N/A	78.4	#	30.0	82.8	#	75	73.5
Concrete Saw	89.6	20%	3	8	78.4	#	30.0	82.8	#	75	73.5

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	77.6	N/A	N/A	N/A	69.4	#	30.0	73.8	#	75	26.1
Backhoe	77.6	40%	3	8	69.4	#	30.0	73.8	#	75	26.1