Santa Clara Valley Water District

Main Avenue and Madrone Pipeline Restoration Project

Final Initial Study and Mitigated Negative Declaration

Project No. 26564001

Prepared by:

Erika Carpenter
Environmental Planner II

Under the Direction of:

Debra Caldon
Water Resources Planning Unit Manager

MAY 2017

(THIS PAGE INTENTIONALLY LEFT BLANK)

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDIX

LIST OF ACRONYMS

AB	Assembly Bill
AFY	Acre Feet Per Year
AQP	Air Quality Plan
ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CAA	Clean Air Act
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CCR	California Code of Regulations
CFS	Cubic Feet Per Second
CO	Carbon Monoxide
CWA	Federal Clean Water Act
dB	Decibel
dBA	Aweighted sound level
District	Santa Clara Valley Water District
DOC	California Department of Conservation
DPM	Diesel Particulate Matter
DTSC	Department of Toxic Substances and Control
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GHGs	Greenhouse Gases
HCP	Habitat Conservation Plan
HSLA	Hazardous Substance Liability Assessment
L_{Max}	Maximum Noise Level
IS	Initial Study
MBTA	Migratory Bird Treaty Act
MMRP	Mitigation Monitoring and Reporting Program
MND	Mitigated Negative Declaration
MTCO	Metric Ton of Carbon Dioxide Equivalent Per Year
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OEHHA	Office of Health Hazard Assessment
PM_{10}	Fine particulate matter less than 10 micrometers
$PM_{2.5}$	Fine particulate matter less than 2.5 micrometers
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
LSAA	Lake and Streambed Alteration Agreement
SCVWD	Santa Clara Valley Water District
SCC	Santa Clara Conduit
SOI	Sphere of Influence
SWPP	Storm Water Pollution and Prevention Plan
TAC	Toxic Air Contaminants
USFWS	United States Fish and Wildlife Service
VHP	Valley Habitat Plan

KEY TERMINOLOGY

Significance Criteria: A set of criteria used by the lead agency to determine whether an impact would be considered significant. The District relied upon the significance criteria set forth in the CEQA Guidelines and criteria based on the regulatory standards of local, state and federal agencies.

Beneficial Impact: A project impact is considered beneficial if it would result in the enhancement or improvement of an existing physical condition in the environment – no mitigation is required when an impact is determined to be beneficial.

No Impact: This is indicated in the Initial Study where, based on the environmental setting, the stated environmental factor does not apply to the proposed project.

Less-Than-Significant Impact: This is indicated in the Initial Study checklist where the impact does not reach the standard of significance set for that factor and the project would therefore cause no substantial change in the environment - no mitigation is required when an impact is determined to be less-than-significant.

Less-Than-Significant Impact with Mitigation: This is indicated in the Initial Study checklist where the impact is determined to exceed the applicable significance criteria, but for which feasible mitigation measure(s) are available to reduce the impact to a level of less-than-significant.

Potentially Significant Impact: This is indicated in the Initial Study checklist where the project impact may cause a substantial adverse change in the environment, but for which (1) no feasible mitigation is available to reduce the impact to a level of less-than-significant, or (2) feasible mitigation has been identified but the residual impact remains significant after mitigation is applied.

Mitigation Measures: Mitigation includes: (a) Avoiding the impact altogether by not taking a certain action or parts of an action. (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment. (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments.[*]

Best Management Practices: A subset of measures derived from standardized District operating procedures. These practices have been identified as methods, activities, procedures, or other management practices for the avoidance or minimization of potential adverse environmental effects. They have been designed for routine incorporation into project designs, without modification or alteration, and represent the 'state of the art' prevention practices.

[*] Authority cited: Sections 21083 and 21087, Public Resources Code; Reference: Sections 21002, 21002.1, 21081, and 21100(c), Public Resources Code.

SECTION 1: INTRODUCTION

Organization of This Document

This document is organized to assist the reader in understanding the potential impacts that the proposed project may have on the environment and to fulfill the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.). Section 1 indicates the purpose under CEQA, sets forth the public participation process, and summarizes applicable state and federal regulatory requirements. Section 2 describes the location and features of the proposed plan and Section 3 describes the environmental setting. Section 4 evaluates the potential impacts through the application of the CEQA Initial Study Checklist questions to project implementation. Section 5 is the Mitigation Monitoring and Reporting Program (MMRP), Section 6 lists the contributors, and Section 7 lists the references used in preparation of this IS/MND.

Purpose of the Initial Study

The Santa Clara Valley Water District (District), acting as the Lead Agency under CEQA, prepared this Initial Study (IS) and Mitigated Negative Declaration (MND) to provide the public, responsible agencies and trustee agencies with information about the potential environmental effects of the Main and Madrone Pipeline Restoration Project (hereinafter "proposed project").

This Mitigated Negative Declaration was prepared consistent with CEQA, the CEQA Guidelines (Title 14 Code of Regulations 15000 et seq.), and District procedures for implementation of CEQA (Environmental Planning Guidance Q520D01 and W520M01). CEQA requires that public agencies such as the District identify significant adverse environmental effects from their discretionary actions and mitigate those adverse effects through feasible mitigation measures or through selection of feasible alternatives.

In addition to acting as the CEQA Lead Agency for its projects, the District's mission includes objectives to conduct its activities in an environmentally sensitive manner as a steward of Santa Clara Basin watersheds. This MND is intended to allow the public to fully understand the environmental implications of the project and incorporates the CEQA process to achieve District goals, which include the following:

- Providing public accountability for projects it proposes or approves;
- Ensuring interagency cooperation during project planning;
- Allowing full public review and participation in project planning; and
- Integrating environmental considerations into its decisions.

Decision to Prepare a Mitigated Negative Declaration

The Initial Study (Section 4) for the proposed project indicates that there are no significant impacts from implementation of the proposed project with implementation of the mitigation measures incorporated herein. District BMP's have also been included as part of the proposed project to further avoid and minimize effects from the proposed work. The analysis indicates that impacts can be mitigated to a less than significant level with mitigation measures incorporated in this IS/MND; will have a less than significant; or no impact will occur. A Mitigated Negative Declaration is consistent with CEQA Guidelines §15070, which indicates that

a Mitigated Negative Declaration is appropriate when the Initial Study identifies potentially significant impacts but:

a) Revisions to the project plan are made that would avoid, or reduce the effects to a point where clearly no significant effects would occur, and

b) There is no substantial evidence, in light of the whole record, that the project, as revised, may have a significant effect on the environment.

Public Review Process

This IS/MND will be circulated to local, state and federal agencies, interested organizations and individuals who may wish to review and provide comments on the project description, the proposed mitigation measures or other aspects of the report. The publication commenced a minimum 30-day public review period consistent with CEQA Guidelines §15105(b) ~~beginning~~ began on March 2, 2017 and ending on April ~~1~~ 3, 2017.

The draft IS/MND and all supporting documents ~~are~~ were available for review at:

- Santa Clara Valley Water District
  5750 Almaden Expressway
  San Jose, CA 95118

- At the local library reference desk:
  Morgan Hill Public Library
  660 West Main Avenue
  Morgan Hill, CA 95037

- Posted on the District website: www.valleywater.org, or

- Via written request for a copy from the District.

Written comments or questions regarding the draft IS/MND ~~should be~~ were submitted to:

Erika S. Carpenter
Environmental Planner II
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3614
Phone: (408) 630-2729
Fax: (408) 979-5657
e-mail: ecarpenter@valleywater.org

~~Submittal of written comments via e-mail will greatly facilitate the response process~~. The District ~~will~~ considered all comments and ~~make~~ made ~~any~~ necessary changes to the document prior to approval of the final IS/MND by the District Board of Directors.

Interagency Collaboration and Regulatory Review

The CEQA review process is intended to provide both trustee and responsible agencies with an opportunity to provide input into the project. Responsible agencies are those that have some responsibility or authority for carrying out or approving a project; in many instances these public

agencies must make a discretionary decision to issue a permit; provide right-of-way, funding or resources to the project. In this instance the County of Santa Clara, City of Morgan Hill, and the California Department of Fish and Game would likely be responsible agencies for the proposed project. The project would also be subject to the federal Endangered Species Act, and would require take authorization from the United States Fish and Wildlife Service through the Santa Clara Valley Habitat Conservation Plan & Natural Communities Conservation Plan (HCP/NCCP). The District would work with these state and federal agencies to ensure that the proposed project meets applicable policies and requirements.

This IS/MND is intended to assist state and local agencies to carry out their responsibilities for permit review or approval authority over the proposed project. Implementation of the proposed project would likely require specific permitting as summarized in Table 1: Summary of Applicable Regulatory Requirements below.

Table 1: **Summary of Applicable Regulatory Requirements**

Agency	Permit/Review Required
State Water Resources Control Board (SWRCB)	National Pollutant Discharge Elimination System (NPDES) Construction General Permit (General Permit)
United States Fish and Wildlife Service under the Endangered Species Act and the California Department of Fish and Wildlife under the California Endangered Species Act	Incidental Take Authorization for activities in Santa Clara County through the Santa Clara Valley Habitat Conservation Plan & Natural Communities Conservation Plan (HCP/NCCP)
City of Morgan Hill and County of Santa Clara	Local permits: encroachment permits, traffic control plans, etc.
California Department of Fish and ~~Game~~ Wildlife (CDFW)	Fish and Game Code §1602 Lake and Streambed Alteration Agreement (LSAA)

SECTION 2: PROJECT DESCRIPTION

Project Objectives

The purpose of the proposed project is to repair the Main Avenue and Madrone Pipelines and expand the capacity of the pipelines to convey 37 cubic feet per second (cfs) of water from Anderson Reservoir and the Santa Clara Conduit to the Main Avenue Percolation Ponds and the Madrone Channel to meet the current and future groundwater demands in the area.

Project Background

The Main Avenue and Madrone Pipeline network is the main water supply system in south Santa Clara County required for recharging the Llagas groundwater sub-basin, which underlies most of the unincorporated portion of Santa Clara County including the cities of Morgan Hill and Gilroy. The regional location is shown in Figure 1: Regional Location Map and the project vicinity is shown in Figure 2: Project Vicinity. Figure 3: Llagas Groundwater Recharge Area shows the boundaries of the Llagas Groundwater Recharge area within Santa Clara County.

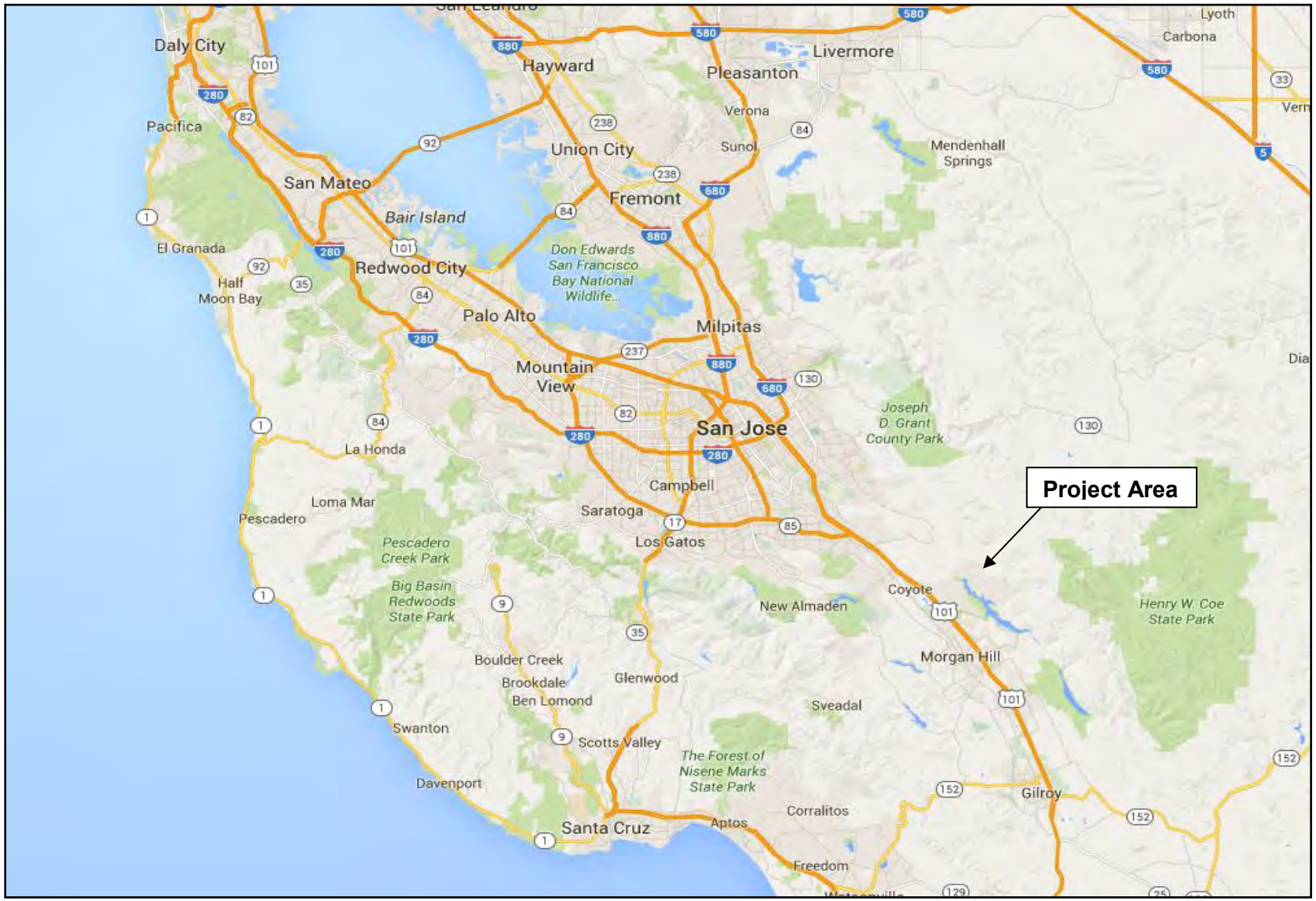
The pipeline network was constructed in 1955 to convey water from the Anderson Dam outlet to the District's Main Avenue Recharge Ponds located near the intersection of Hill Road and East Main Avenue, and to the Madrone Channel, which extends for approximately three miles east of and parallel to U.S. Highway 101 (U.S. 101) in Morgan Hill. In 1989, the District modified the Main Avenue and Madrone Pipeline network to tap into the Santa Clara Conduit (SCC) pipeline to diversify the water source for recharge of the Llagas groundwater subbasin.

Over the past 60 years, the pipeline conveyance capacity has deteriorated due to leakage and invasive tree roots. Temporary fixes such as root removal and patching have been implemented, however, the condition of the pipeline continues to degrade and the capacity continues to decline.

In addition, the current operational capacities of the Main Avenue and Madrone Pipelines are unable to meet future water supply needs of the Llagas subbasin. During development of the District's *Integrated Water Resources Planning Study* (Santa Clara Valley Water District 2003), it was determined that there would be frequent water supply shortages within 25 years in southern Santa Clara County. A later study conducted by the District in collaboration with the cities of Morgan Hill and Gilroy and the County of Santa Clara estimated that water supply shortages range from 4,000 acre feet per year (AFY) to 16,000 AFY by the year 2030. These shortfalls were determined to be more pronounced in the Morgan Hill area due to limited groundwater sub-basin inflows.

The average annual managed recharge for the Madrone Channel is 5,300 AFY and 2,700 AFY for the Main Avenue Percolation Ponds for an average total of 8,000 AFY. The *Integrated Water Resources Planning Study* recommends providing an additional 5,670 AFY of groundwater recharge to meet future demands for the Llagas subbasin. The Main Avenue Percolation Ponds do not have additional recharge capability; however, the Madrone Channel has approximately 5,700 AFY additional recharge capacity. The maximum future recharge capacity for this system is estimated at 14,000 AFY to meet the groundwater demands of the Llagas subbasin.

Figure 1: Regional Location Map



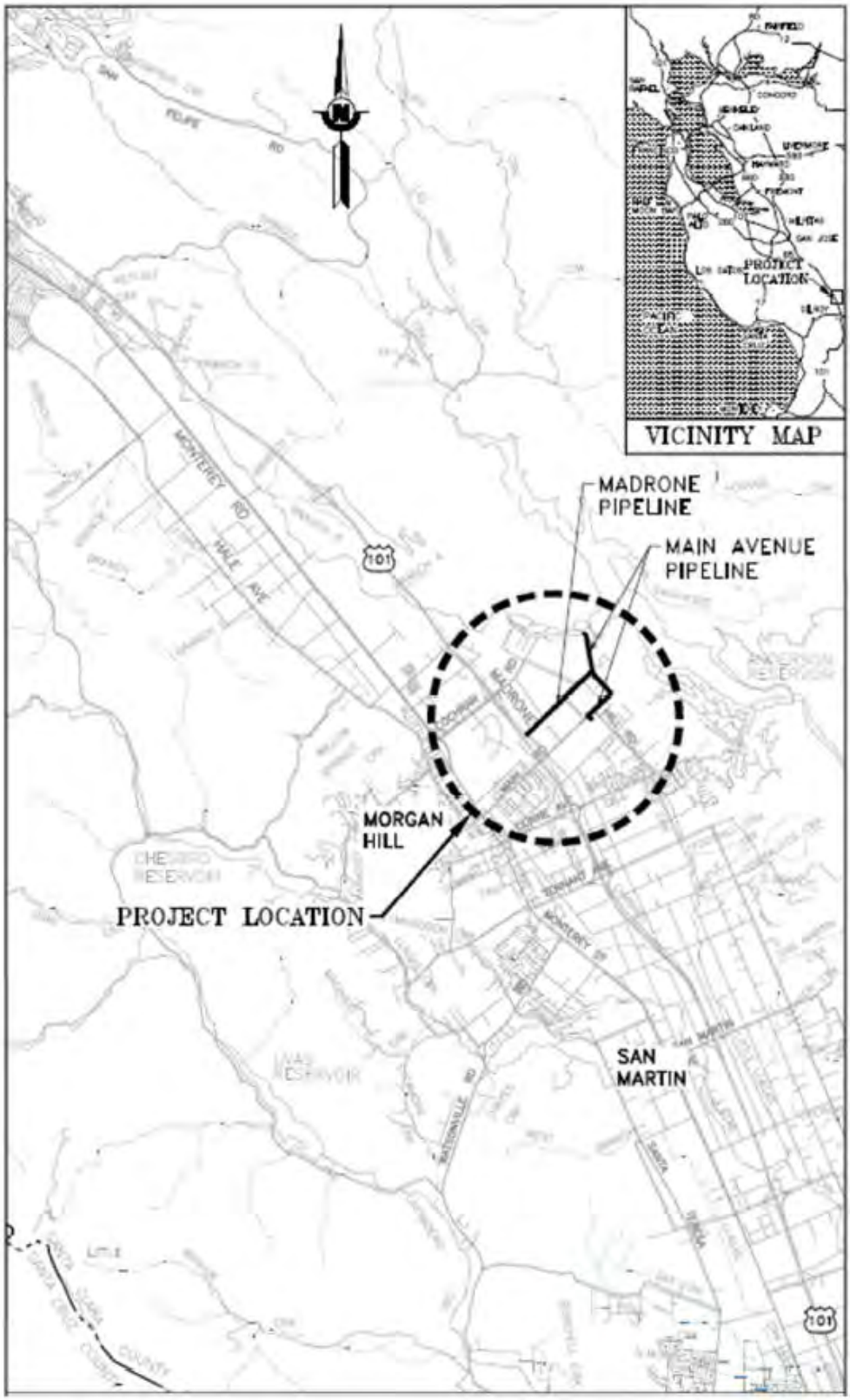


Figure 2: Project Vicinity

Figure 3: Llagas Groundwater Recharge Area

Project Planning

The District examined a variety of approaches to repair the leakage of the Main Avenue and Madrone Pipelines and improve the capacity, which will meet future water supply demands in the area in the Llagas groundwater recharge area. The project's planning phase was performed to confirm the existing conditions, define the problems, and develop project alternatives.

A planning level hydraulic analysis was conducted which determined that to meet the future annual recharge volumes for the recharge ponds, the Main Avenue and Madrone pipelines should be replaced with larger pipes. Three approaches to replace the existing pipelines were evaluated including slip-lining, pipe bursting, and the standard open-trench construction method for pipe replacement. As part of the planning phase, District staff determined that the recommended alternative would be the standard open-trench construction method, which would also be the most cost-effective choice for the proposed project. The staff recommended alternative also includes demolition and reconstruction of an existing chemical feed station.

Project Elements

The proposed project would be implemented along three major segments as described below (see Figure 4a: Site Plan):

- Segment 1 (Main Avenue Pipeline): 2,800 linear feet of 16-inch diameter pipe from the Anderson Reservoir outlet to the Cochrane Road and Half Road intersection will be replaced with 36-inch pipe. During construction of Segment 1, both the Main Avenue Ponds and Madrone Channel recharge facilities will be operational.

- Segment 2 (Main Avenue Pipeline): 4,860 linear feet of 16-inch, 18-inch, and 24-inch diameter pipe from the Cochrane Road and Half Road intersection to the Main Avenue Percolation Ponds will be replaced with 30-inch pipe. Some of the existing pipeline will be abandoned in place. During construction of Segment 2, the Madrone Channel recharge facility will be operational.

- Segment 3 (Madrone Pipeline): 6,300 linear feet of 24-inch diameter and 30-inch diameter pipe from the Cochrane Road and Half Road intersection to the Madrone Channel will be replaced with 30-inch pipe. During construction of Segment 3, the Main Avenue Ponds recharge facility will be operational.

In addition, underground utility vaults would be constructed at the end of the pipelines; the existing discharge pipes at the ~~Main Avenue Percolation Ponds and the~~ Madrone Channel would be upgraded to include an energy dissipater; and an existing chemical feed station on Cochrane Road would be demolished and reconstructed north of Main Avenue near the Main Avenue turnout. The new chemical feed station would occupy approximately ~~299~~ 300 square feet and would be comprised of pre-fabricated concrete materials. It would include a 500-gallon chemical tank, a metering pump, calibration cylinder, and associated equipment and would be connected to the existing East Main Avenue Turnout and to a chemical injection vault located within East Main Avenue with PVC pipe. The proposed energy dissipater at Madrone Channel would require approximately 500 square feet of rip-rap on the bank of Madrone Channel to prevent erosion. The site plan for the chemical feed station is included as Figure 4c: Chemical Feed Station Site Plan and the site plan for the energy dissipater is included as Figure 4d: Energy Dissipater at Madrone Channel. Full size plans for the proposed project are available for review at the Santa Clara Valley Water District at 5750 Almaden Expressway, San Jose, CA 95118.

(THIS PAGE INTENTIONALLY LEFT BLANK)

Figure 4a: Site Plan

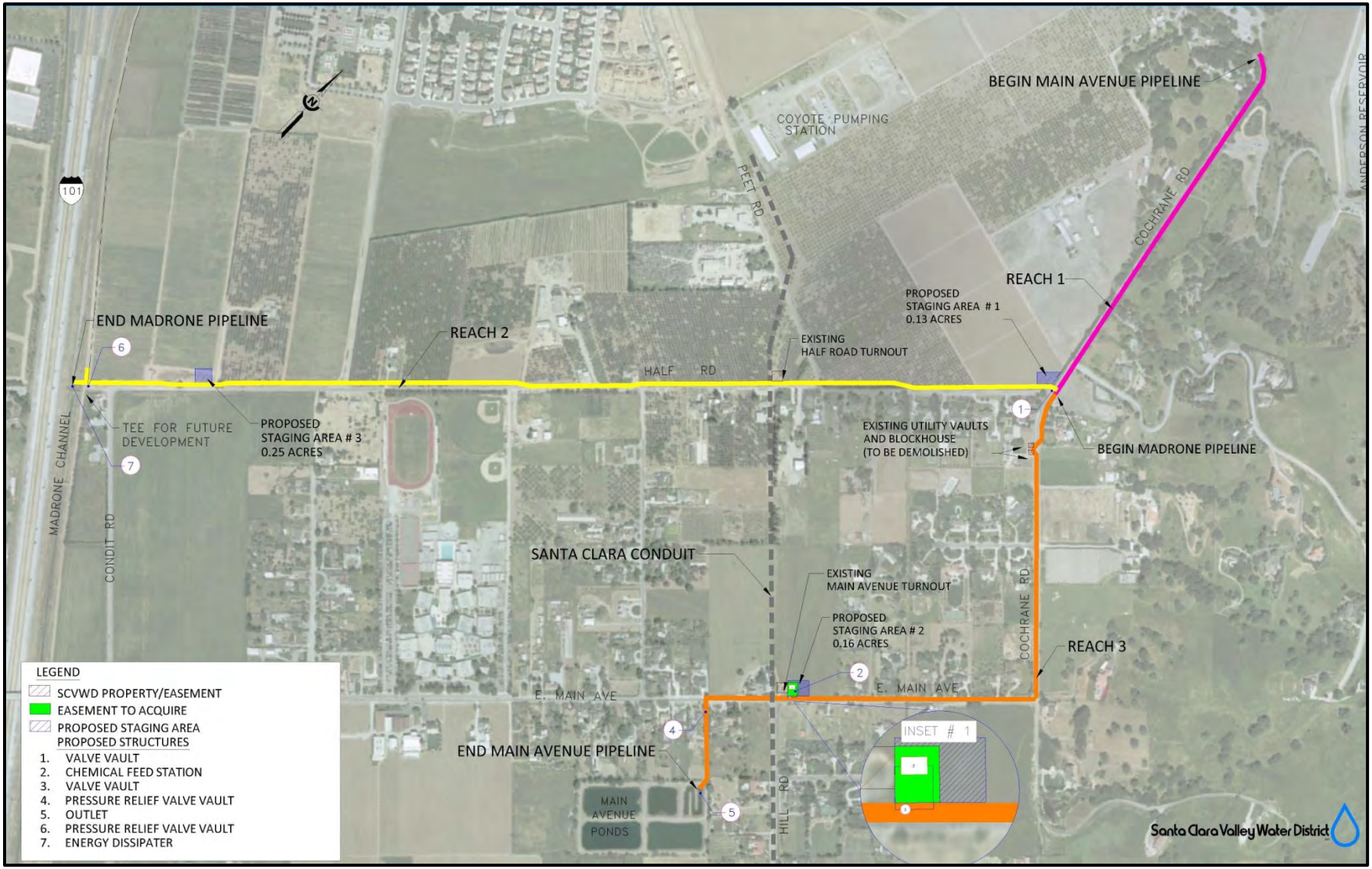


Figure 4b: Site Plan for Chemical Feed Station

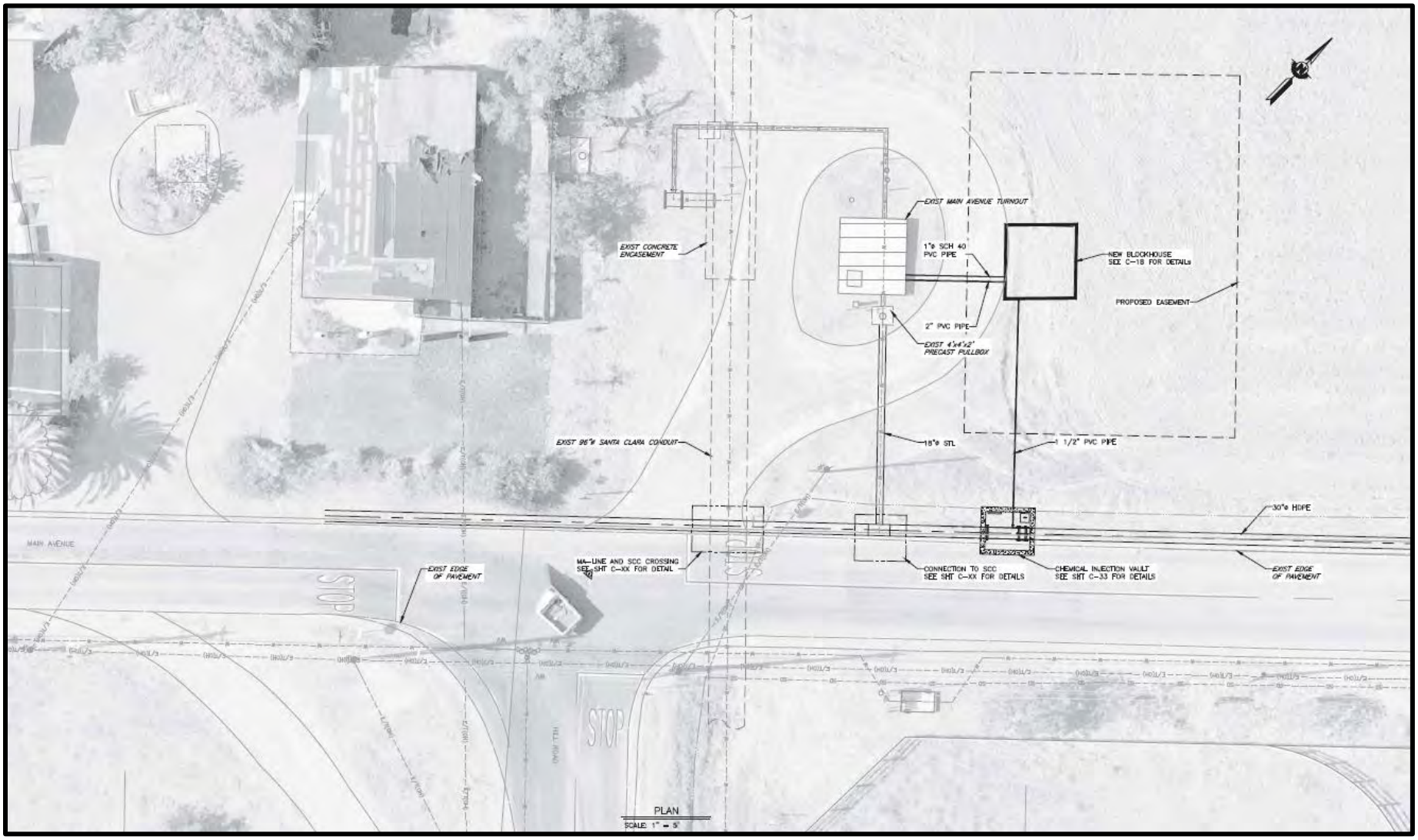
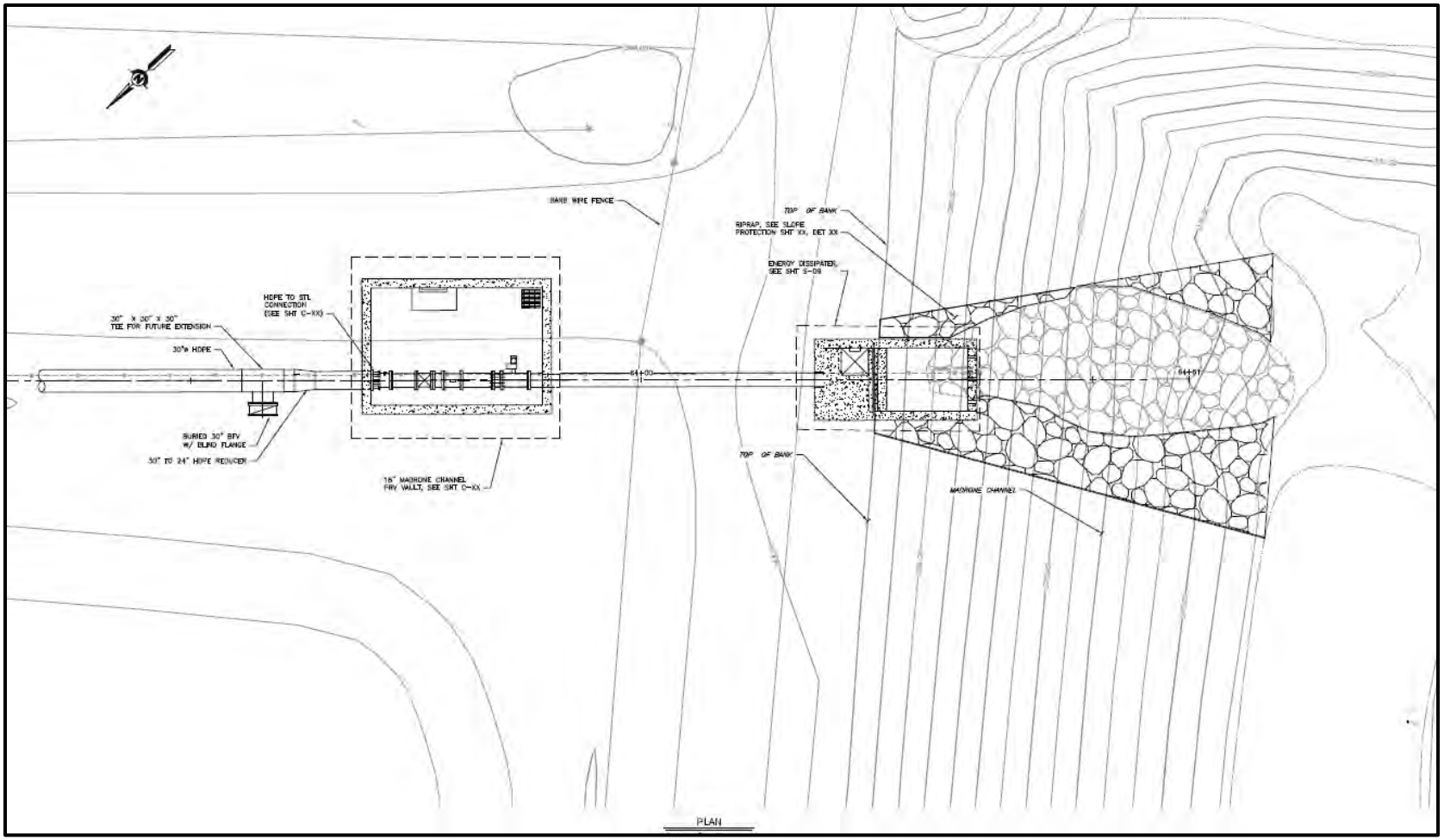


Figure 4c: Site Plan for Energy Dissipater at Madrone Channel



Implementation of the proposed project would deliver the historical annual groundwater recharge volume of 8,000 AFY to the Madrone Channel and Main Avenue Percolation Ponds; deliver the maximum recharge capacity of up to 14,000 AFY to meet future water supply demands in the Llagas subbasin; and would attain a maximum 50-year design life for the pipelines and their appurtenances.

Property Acquisition and Lease Agreements

Implementation of the proposed project would require acquisition of a portion of parcel APN 728-27-008 along East Main Avenue for construction of the chemical feed station, as well as use of the property for a staging area during construction activities. The proposed project would also include execution of leasing agreements for the two additional staging areas located on Assessor's Parcel Numbers: 728-30-009 and 728-34-030. An easement along Assessor's Parcel Number 728-33-005 would also be required for construction of the pipeline along Half Road as the County of Santa Clara only has a surface easement on the existing roadway.

Construction Activities

Construction Phasing and Days/Hours of Operation

Construction would occur over a 17-month period beginning in approximately July 2017 and concluding in November 2018. Construction hours would typically be Monday through Friday between 8:00 AM to 5:00 PM. No construction is planned on weekends or holidays. Construction phases would include: excavation and pipeline demolition; material hauling; pipeline installation and backfill; and paving. Several of the phases of the proposed project may occur simultaneously.

The existing pipeline alignment would be excavated and the old pipe removed. Following excavation, the project would be constructed using the open trench method, which would involve lowering 40-foot long pipe barrels into the trench using a hydraulic excavator. Each pipe would be aligned and joined to the previously installed pipe in the trench. Construction activities would require traffic control measures (e.g. lane detours, signs, barricades, fences, gates, etc.) for each segment of the proposed project that is under construction. The proposed project would remove approximately 28,889 cubic yards of soil and asphalt, which would be replaced with approximately 12,742 linear feet of pipeline, 6,614 cubic yards of bedding, and 14,603 cubic yards of backfill. Once soil is excavated, it will either be used on-site or hauled off-site.

Construction Vehicle Trips and Equipment

Construction vehicle trips would include the following: (1) employee commute trips; (2) construction vehicles traveling to and from staging areas during construction; and (3) off-site material-hauling trips. Approximately 25 employees would be required for construction activities during each phase. The project is anticipated to result in an average of 162 vehicle trips per day.

Table 2: Construction Equipment presents the amount of construction equipment required during each phase of construction and the expected hours per day. Equipment would be maintained and stored within three proposed staging areas (see details below) and the limits of the construction activities. The following construction equipment would be required during each phase of construction.

Table 2: Construction Equipment

Construction Phase	Equipment Type	Quantity	Hours per Day
Excavation and Pipeline Demolition	Backhoe Loader	1	8
	Hydraulic Excavator	1	8
	Material Handler	1	8
On-Site Material Hauling	Dump Truck	1	8
	Wheel Dozer	1	8
	Material Handler	2	8
Pipeline Installation and Backfill	Hand Equipment	3	8
	Road Sweeper	1	8
	Crane	1	8
Paving	Compactor	1	8
	Motor Graders	1	8
	Paving Equipment	2	8

Off-Site Material Hauling

Off-site material-hauling trips would haul the pipeline and other materials that are not part of the backfill to a landfill or material recovery facility throughout the workday. The proposed project would require hauling approximately 100 tons of demolished pipes; 27,632 cubic yards of soil; and 1,257 cubic yards of asphalt to the landfill. This would require approximately 12,750 truckloads of material over the course of 17 months, which is approximately 80 round-trip truckloads per day. The material hauling trips would travel north to the Cochrane Road on-ramp.

Staging Areas

The proposed project includes three staging areas within the project area on active and fallow agricultural land that has been previously disturbed by agricultural activities (e.g. tiling) and/or used for equipment storage for farming equipment. The staging areas are proposed on the following parcels:

1. Staging Area 1 (0.13 of an acre) is located at the corner of Cochrane Road and Half Road on Assessor's Parcel Number (APN) 728-34-030.

2. Staging Area 2 (0.16 of an acre) is located on East Main Avenue near the Main Avenue Percolation Ponds on APN 728-27-008.; and

3. Staging Area 3 (0.25 of an acre) is located on Half Road at the corner of Saint Louise Drive near the Madrone Channel on APN 728-30-009.

As part of the project plans, equipment would be placed in staging areas and surrounded by orange cones or caution tape during construction activities. Site preparation is not proposed and once staging has been completed, the sites would be restored to their prior condition.

Dewatering

If dewatering of the pipeline is necessary and/or if groundwater is encountered within the planned depth of excavation during construction activities, the dewatered water would be

drained, pumped and discharged to adjacent agricultural fields based on agreements with surrounding landowners, any adjacent storm drains, and/or pumped to the Madrone Channel or the Main Avenue Percolation Ponds based on the location within the construction area. The water in the pipeline is untreated/raw water. As the amount of water in the pipelines is not known, the analysis is conservative and assumes the existing capacity of 2.6 million gallons or 8,000 acre feet of raw water would be discharged within the project area during construction activities. Water quality of the discharged water will be monitored consistent with applicable requirements.

For installation of the energy dissipater structures at the Madrone Channel and the Main Avenue Percolation Ponds, water levels at both facilities would be lowered consistent with District maintenance practices.

Site Restoration

The proposed project would require approximately 10,238 square yards of pavement for repaving the roads once construction activities are complete.

SECTION 3: ENVIRONMENTAL SETTING

Project Location

The proposed project is in the eastern portion of the City of Morgan Hill (City) and in unincorporated Santa Clara County within the City's Sphere of Influence (SOI). The boundaries of the project area are generally east of U.S. 101, south of Cochrane Road, and north of Half Road. Project activities would primarily occur within Cochrane Road, East Main Avenue, and Half Road along the Main Avenue and Madrone Pipelines. The regional location is shown in Figure 1: Regional Location Map and the project vicinity is shown in Figure 2: Project Vicinity. The jurisdictional boundaries of the City of Morgan Hill and County of Santa Clara are shown in Figure 5: Jurisdictional Boundaries. Photographs of the project area are shown in Figures 6a and 6b.

Surrounding Land Uses

Surrounding uses include primarily low-density residential and agricultural uses, as well as Live Oak High School, which is located less than 1,000 feet from Reach 2 of the proposed project along Half Road. U.S. Highway 101 is located to the west and Anderson Reservoir is located to the east of the project area.

Physical Environment

The project area consists of existing pipelines located within paved roadways along Cochrane Road, East Main Avenue, and Half Road. The Main Avenue Pipeline extends from the base of Anderson Reservoir and runs primarily along Cochrane Road and East Main Avenue to the District's Main Avenue Recharge Ponds. The Madrone Pipeline runs primarily along Half Road from Cochrane Road to the District's Madrone Channel.

Figure 5: Jurisdictional Boundaries

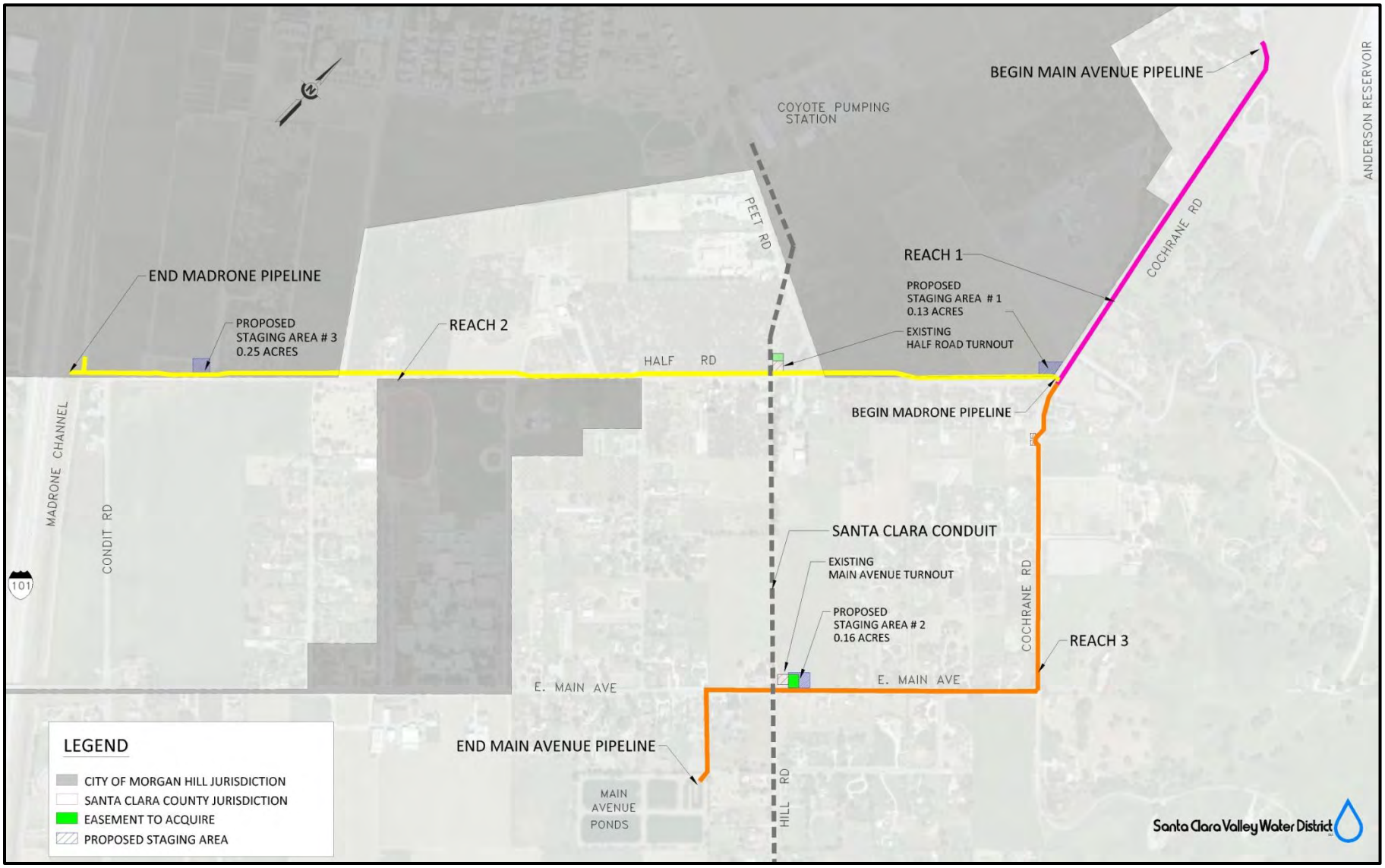


Figure 6a: Photographs of the Project Area

Photo 1. *Existing chemical feed station located on Cochrane Road.*

Photo 2. *View of existing roadway and surrounding land uses along Half Road.*

Figure 6b: Photographs of the Project Area

***Photo 3**. View of U.S.101 and the Madrone Channel in the southwestern portion of the project area near where the energy dissipater is proposed.*

***Photo 4**. View of the Main Avenue Percolation Ponds in the southern portion of the project area where installation of the energy dissipater is proposed.*

Environmental Protection Measures

Best Management Practices

Best Management Practices (BMPs) are standard operating procedures to prevent, avoid, or minimize effects associated with construction and other activities. The District routinely incorporates a wide range of BMPs into project design as described in detail in its Best Management Practices Handbook (District 2011). The proposed project would include the applicable District BMPs as summarized in Table 3.

Santa Clara Valley Habitat Plan

The proposed project is a covered activity in the *Santa Clara Valley Habitat Plan* (VHP), which is a joint habitat conservation plan and natural communities conservation plan developed to serve as the basis for the issuance of incidental take permits and authorizations pursuant to Section 10 of the federal Endangered Species Act and the California Natural Community Conservation Planning Act. The District would adhere to all applicable VHP conditions including Conditions 1, 3, 12, and 17. These conditions are summarized in Table 3.

Table 3: District Best Management Practices and Santa Clara Valley Habitat Plan (VHP) Conditions Incorporated into the Proposed Project

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
Air Quality		
AQ-1	Use Dust Control Measures	The following Bay Area Air Quality Management District (BAAQMD) Dust Control Measures will be implemented: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day; 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered; 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited; 4. Water used to wash the various exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, etc.) will not be allowed to enter waterways; 5. All vehicle speeds on unpaved roads shall be limited to 15 mph; 6. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used; 7. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations), and this requirement shall be clearly communicated to

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		construction workers (such as verbiage in contracts and clear signage at all access points); 8. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications, and all equipment shall be checked by a certified visible emissions evaluator; 9. Correct tire inflation shall be maintained in accordance with manufacturer's specifications on wheeled equipment and vehicles to prevent excessive rolling resistance; and, 10. Post a publicly visible sign with a telephone number and contact person at the lead agency to address dust complaints; any complaints shall be responded to and take corrective action within 48 hours. In addition, a BAAQMD telephone number with any applicable regulations will be included.
AQ-2	Avoid Stockpiling Odorous Materials	Materials with decaying organic material, or other potentially odorous materials, will be handled in a manner that avoids impacting residential areas and other sensitive receptors, including: 1. Avoid stockpiling potentially odorous materials within 1,000 feet of residential areas or other odor sensitive land uses; and 2. Odorous stockpiles will be disposed of at an appropriate landfill.
Biological Resources		
BI-1	Nesting birds are protected by state and federal laws.	The District will protect nesting birds and their nests from abandonment, loss, damage, or destruction. Nesting bird surveys will be performed by a qualified biologist prior to any activity that could result in the abandonment, loss, damage, or destruction of birds, bird nests, or nesting migratory birds. Inactive bird nests may be removed with the exception of raptor nests. Birds, nests with eggs, or nests with hatchlings will be left undisturbed.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
BI-2	Avoid Animal Entry and Entrapment	All pipes, hoses, or similar structures less than 12 inches in diameter will be closed or covered to prevent animal entry. All construction pipes, culverts, or similar structures, greater than 2-inches diameter, stored at a construction site overnight, will be inspected thoroughly for wildlife by a qualified biologist or properly trained construction personnel before the pipe is buried, capped, used, or moved. If inspection indicates presence of sensitive or state- or federally-listed species inside stored materials or equipment, work on those materials will cease until a qualified biologist determines the appropriate course of action. To prevent entrapment of animals, all excavations, steep-walled holes or trenches more than 6-inches deep will be secured against animal entry at the close of each day. Any of the following measures may be employed, depending on the size of the hole and method feasibility: 1. Hole to be securely covered (no gaps) with plywood, or similar materials, at the close of each working day, or any time the opening will be left unattended for more than one hour; or 2. In the absence of covers, the excavation will be provided with escape ramps constructed of earth or untreated wood, sloped no steeper than 2:1, and located no farther than 15 feet apart; or In situations where escape ramps are infeasible, the hole or trench will be surrounded by filter fabric fencing or a similar barrier with the bottom edge buried to prevent entry.
BI-3	Minimize Predator-Attraction	Remove trash daily from the worksite to avoid attracting potential predators to the site.
Cultural Resources		
CU-1	Accidental Discovery of Archaeological Artifacts or Burial Remains	If historical or unique archaeological artifacts are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Work at the location of the find will halt immediately within 30 feet of the find. A “no work” zone shall be established utilizing appropriate flagging to delineate the boundary of this zone. A Consulting Archaeologist will visit the discovery site as soon as practicable for identification and evaluation pursuant to Section 21083.2 of the Public Resources Code and Section 15126.4 of the California Code of Regulations. If the archaeologist determines that the artifact is not significant, construction may resume. If the archaeologist determines that the artifact is significant, the archaeologist will determine if the artifact can be avoided and, if so, will detail avoidance procedures. If the artifact cannot be avoided, the archaeologist will develop within 48 hours an

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		Action Plan which will include provisions to minimize impacts and, if required, a Data Recovery Plan for recovery of artifacts in accordance with Public Resources Code Section 21083.2 and Section 15126.4 of the CEQA Guidelines. If burial finds are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Upon discovering any burial site as evidenced by human skeletal remains, the County Coroner will be immediately notified and the field crew supervisor shall take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent. No further excavation or disturbance within 30 feet of the site or any nearby area reasonably suspected to overlie adjacent remains may be made except as authorized by the County Coroner, California Native American Heritage Commission, and/or the County Coordinator of Indian Affairs.
Hazards and Hazardous Materials		
HM-1	Restrict Vehicle and Equipment Cleaning to Appropriate Locations	Vehicles and equipment may be washed only at approved areas. No washing of vehicles or equipment will occur at job sites.
HM-2	Ensure Proper Vehicle and Equipment Fueling and Maintenance	No fueling or servicing will be done in a waterway or immediate flood plain, unless equipment stationed in these locations is not readily relocated (i.e., pumps, generators). 1. For stationary equipment that must be fueled or serviced on-site, containment will be provided in such a manner that any accidental spill will not be able to come in direct contact with soil, surface water, or the storm drainage system. 2. All fueling or servicing done at the job site will provide containment to the degree that any spill will be unable to enter any waterway or damage riparian vegetation. 3. All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will be prevented. 4. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Maintenance, repairs, or other necessary actions will be taken to prevent or repair leaks, prior to use. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be done in a channel or flood plain.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
HM-3	Ensure Proper Hazardous Materials Management	Measures will be implemented to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means. 1. Prior to entering the work site, all field personnel will know how to respond when toxic materials are discovered. 2. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers with appropriate secondary containment to prevent any spillage or leakage. 3. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials will not contact soil and not be allowed to enter surface waters or the storm drainage system. 4. All toxic materials, including waste disposal containers, will be covered when they are not in use, and located as far away as possible from a direct connection to the storm drainage system or surface water. 5. Quantities of toxic materials, such as equipment fuels and lubricants, will be stored with secondary containment that is capable of containing 110% of the primary container(s). 6. The discharge of any hazardous or non-hazardous waste as defined in Division 2, Subdivision 1, Chapter 2 of the California Code of Regulations will be conducted in accordance with applicable State and federal regulations. In the event of any hazardous material emergencies or spills, personnel will call the Chemical Emergencies/Spills Hotline at 1-800-510-5151.
HM-4	Utilize Spill Prevention Measures	Prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water following these measures: 1. Field personnel will be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills; 2. Equipment and materials for cleanup of spills will be available on site, and spills and leaks will be cleaned up immediately and disposed of according to applicable regulatory requirements; 3. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means; 4. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations), and all field personnel will be advised of these locations; and,

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		5. The work site will be routinely inspected to verify that spill prevention and response measures are properly implemented and maintained.
HM-5	Incorporate Fire Prevention Measures	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. An extinguisher shall be available at the project site at all times when welding or other repair activities that can generate sparks (such as metal grinding) is occurring. Smoking shall be prohibited except in designated staging areas and at least 20 feet from any combustible chemicals or vegetation.
Hydrology and Water Quality		
WQ-1	Conduct Work from the Top of Bank	For work activities that will occur in the channel, work will be conducted from the top of the bank if access is available and there are flows in the channel.
WQ-2	Limit Impacts From Staging and Stockpiling Materials	1. To protect on-site vegetation and water quality, staging areas should occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation. Similarly, all equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. 2. Building materials and other project-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains. 3. No runoff from the staging areas may be allowed to enter water ways, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, swale, hay wattles or bales, silt screens). 4. The discharge of decant water to water ways from any on-site temporary sediment stockpile or storage areas is prohibited. 5. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control. During the dry season; exposed, dry stockpiles will be watered, enclosed, covered, or sprayed with non-toxic soil stabilizers.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
WQ-3	Stabilize Construction Entrances and Exits	Measures will be implemented to minimize soil from being tracked onto streets near work sites: 1. Methods used to prevent mud from being tracked out of work sites onto roadways include installing a layer of geotextile mat, followed by a 4-inch thick layer of 1 to 3-inch diameter gravel on unsurfaced access roads. Access will be provided as close to the work area as possible, using existing ramps where available and planning work site access so as to minimize disturbance to the water body bed and banks, and the surrounding land uses.
WQ-4	Use Seeding for Erosion Control, Weed Suppression, and Site Improvement	Disturbed areas shall be seeded with native seed as soon as is appropriate after activities are complete. An erosion control seed mix will be applied to exposed soils down to the ordinary high water mark in streams. 1. The seed mix should consist of California native grasses, (for example *Hordeum brachyantherum*; *Elymus glaucus*; and annual *Vulpia microstachyes*) or annual, sterile hybrid seed mix (e.g., Regreen™, a wheat x wheatgrass hybrid). 2. Temporary earthen access roads may be seeded when site and horticultural conditions are suitable, or have other appropriate erosion control measures in place.
WQ-5	Maintain Clean Conditions at Work Sites	The work site, areas adjacent to the work site, and access roads will be maintained in an orderly condition, free and clear from debris and discarded materials on a daily basis. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust into storm drains or waterways. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged. Any materials and equipment left on the site overnight will be stored to avoid erosion, leaks, or other potential impacts to water quality Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the work site.
WQ-6	Prevent Water Pollution	Oily, greasy, or sediment laden substances or other material that originate from the project operations and may degrade the quality of surface water or adversely affect aquatic life, fish, or wildlife will not be allowed to enter, or be placed where they may later enter, any waterway.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		The project will not increase the turbidity of any watercourse flowing past the construction site by taking all necessary precautions to limit the increase in turbidity as follows: 1. where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases will not exceed 5 percent; 2. where natural turbidity is greater than 50 NTU, increases will not exceed 10 percent; 3. where the receiving water body is a dry creek bed or storm drain, waters in excess of 50 NTU will not be discharged from the project. Water turbidity changes will be monitored. The discharge water measurements will be made at the point where the discharge water exits the water control system for tidal sites and 100 feet downstream of the discharge point for non-tidal sites. Natural watercourse turbidity measurements will be made in the receiving water 100 feet upstream of the discharge site. Natural watercourse turbidity measurements will be made prior to initiation of project discharges, preferably at least 2 days prior to commencement of operations.
WQ-7	Prevent Stormwater Pollution	To prevent stormwater pollution, the applicable measures from the following list will be implemented: 1. Soils exposed due to project activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality protected prior to significant rainfall. In creeks, the channel bed and areas below the Ordinary High Water Mark are exempt from this BMP. 2. The preference for erosion control fabrics will be to consist of natural fibers; however, steeper slopes and areas that are highly erodible may require more structured erosion control methods. No non-porous fabric will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would be impacted by the application. 3. Erosion control measures will be installed according to manufacturer's specifications. 4. To prevent stormwater pollution, the appropriate measures from, but not limited to, the following list will be implemented: • Silt Fences • Straw Bale Barriers • Brush or Rock Filters

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		• Storm Drain Inlet Protection • Sediment Traps or Sediment Basins • Erosion Control Blankets and/or Mats • Soil Stabilization (i.e., tackified straw with seed, jute or geotextile blankets, etc.) • Straw mulch. 5. All temporary construction-related erosion control methods shall be removed at the completion of the project (e.g., silt fences). 6. Surface barrier applications installed as a method of animal conflict management, such as chain link fencing, woven geotextiles, and other similar materials, will be installed no longer than 300 feet, with at least an equal amount of open area prior to another linear installation.
WQ-8	Manage Sanitary and Septic Waste	Temporary sanitary facilities will be located on jobs that last multiple days, in compliance with California Division of Occupational Safety and Health (Cal/OSHA) regulation 8 California Code of Regulations 1526. All temporary sanitary facilities will be located where overflow or spillage will not enter a watercourse directly (overbank) or indirectly (through a storm drain).
Traffic and Transportation		
TR-1	Incorporate Public Safety Measures	Fences, barriers, lights, flagging, guards, and signs will be installed as determined appropriate by the public agency having jurisdiction, to give adequate warning to the public of the construction and of any dangerous condition to be encountered as a result thereof.
Santa Clara Valley Habitat Plan Conditions		
Condition 1	Avoid Direct Impacts on Legally Protected Plant and Wildlife Species	Compliance with Condition 1 within the project area would necessitate avoiding take of nesting white-tailed kites either by implementing repairs during the non-breeding season (1 September to 31 January) or by conducting pre-construction surveys and maintaining appropriate buffers around kite nests that contain eggs or young as noted on pages 6-7 and 6-8 of the VHP.
Condition 3	Maintain Hydrologic Conditions and Protect Water Quality	Compliance with Condition 3 necessitates implementing applicable measures listed in Chapter 6 (Table 6-2) of the VHP. These measures are BMPs to protect water quality and avoid other adverse effects, such as source and treatment control measures to prevent pollutants from leaving the construction site and minimizing site erosion and local sedimentation during construction. Many of

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		these measures overlap or are similar to the District's BMPs.
Condition 12	Wetland and Pond Avoidance	Compliance with Condition 12 helps to minimize impacts on wetlands and ponds and avoid impacts on high quality wetlands and ponds by prescribing vegetated stormwater filtration features, proper disposal of cleaning materials, and other requirements. The proposed project will be required to implement the avoidance and minimization measures listed in Chapter 6 on pages 6-56 through 6-58 of the VHP.
Condition 17	Tricolored Blackbird	Condition 17 is to avoid direct impacts of covered activities on nesting tricolored blackbird colonies. This condition in the VHP is required as it is located within 250 feet of a riparian cover type. If a project meets this criterion, a qualified biologist is required to conduct a field investigation to identify and map potential nesting substrate as described on pages 6-70 and 6-71 of the VHP. Nesting substrate includes flooded, thorny or spiny vegetation.

SECTION 4: ENVIRONMENTAL EVALUATION

Initial Study Checklist

In accordance with CEQA, the following Initial Study Checklist analyzes the project's potential environmental effects to determine the appropriate level of environmental review needed. Answers to the checklist questions provide factual evidence and District rationale for determinations of the potential significance of impacts resulting from the proposed project.

ENVIRONMENTAL CHECKLIST FORM

Project Title:	Main Avenue and Madrone Pipeline Restoration Project
Lead Agency Name and Address:	Santa Clara Valley Water District 5750 Almaden Expressway San Jose CA 95118
Contact Person and Phone Number:	Erika S. Carpenter, Environmental Planner II (408) 630-2729
Project Location:	The proposed area is in the eastern portion of the City of Morgan Hill and in unincorporated Santa Clara County within the City's Sphere of Influence (SOI). The boundaries of the project area are generally east of U.S. 101, south of Cochrane Road, and north of Half Road. Project activities would primarily occur within Cochrane Road, East Main Avenue, and Half Road along the Main Avenue and Madrone Pipelines. The regional location is shown in Figure 1: Regional Location Map and the project vicinity is shown in Figure 2: Project Vicinity. The jurisdictional boundaries of the City of Morgan Hill and County of Santa Clara are shown in Figure 5: Jurisdictional Boundaries. Photographs of the project area are shown in Figures 6a and 6b.
Project Sponsor's Name	Santa Clara Valley Water District 5750 Almaden Expressway San Jose CA 95118
General Plan Designation:	According to the *City of Morgan Hill General Plan*, surrounding land use designations in the project area include: Rural County and Single Family Low (1 to 3 dwelling units per acre) in the northeastern portion of the project area along Cochrane Road; "Rural County," "Residential Estate (0 to1 dwelling units per acre)," "Public Facilities," "Multi-Family Low (5 to 14 dwelling units per acre)," and "Industrial" from east to west along Half Road; and "Rural County" along East Main Avenue. Per the *County of Santa Clara General Plan*, the portions of the project area in unincorporated Santa Clara County in the City's SOI are designated "Agricultural Medium Scale."
Zoning:	According to the *City of Morgan Hill Zoning Map*, for the portions of the project area located within the City of Morgan Hill parcels to the northeast of Cochrane Road are zoned Residential Estate 40,000 district (RE-40,000) RPD and Single Family Medium Density 20,000 district (R1-20,000) RPD and parcels along Half Road in the vicinity of U.S. 101 are zoned Medium Density Residential, 3,500 district (R2-3,500) and Planned Unit Development (PUD) to the north and

	Public Facility district (PF) at the Live Oak High School located south of Half Road. Per the *County of Santa Clara Zoning Map*, the remaining parcels located in unincorporated Santa Clara County are designated Exclusive Agriculture (A-20).
Description of the Project:	The proposed project would be implemented along three major segments as described below (see Figure 4a: Site Plan): • Segment 1 (Main Avenue Pipeline): 2,800 linear feet of 16-inch diameter pipe from the Anderson Reservoir outlet to the Cochrane Road and Half Road intersection will be replaced with 36-inch pipe. During construction of Segment 1, both the Main Avenue Ponds and Madrone Channel recharge facilities will be operational. • Segment 2 (Main Avenue Pipeline): 4,860 linear feet of 16-inch, 18-inch, and 24-inch diameter pipe from the Cochrane Road and Half Road intersection to the Main Avenue Percolation Ponds will be replaced with 30-inch pipe. Some of the existing pipeline will be abandoned in place. During construction of Segment 2, the Madrone Channel recharge facility will be operational. • Segment 3 (Madrone Pipeline): 6,300 linear feet of 24-inch diameter and 30-inch diameter pipe from the Cochrane Road and Half Road intersection to the Madrone Channel will be replaced with 30-inch pipe. During construction of Segment 3, the Main Avenue Ponds recharge facility will be operational. In addition, underground utility vaults would be constructed at the end of the pipelines; the existing discharge pipes at the ~~Main Avenue Percolation Ponds and the~~ Madrone Channel would be upgraded to include an energy dissipater; and an existing chemical feed station on Cochrane Road would be demolished and reconstructed north of Main Avenue near the Main Avenue turnout. The new chemical feed station would occupy approximately ~~299~~ 300 square feet and would be comprised of pre-fabricated concrete materials. It would include a 500-gallon chemical tank, a metering pump, calibration cylinder, and associated equipment and would be connected to the existing East Main Avenue Turnout and to a chemical injection vault located within East Main Avenue with PVC pipe. The proposed energy dissipater at Madrone Channel would require approximately 500 square feet of rip-rap on the bank of Madrone Channel to prevent erosion. The site plan for the chemical feed station is included as Figure 4c: Chemical Feed Station Site Plan and the site plan for the energy dissipater is included as Figure 4d: Energy Dissipater at Madrone Channel.
Surrounding Land Uses	Surrounding uses include low-density residential and agricultural uses, as well as Live Oak High School, which is located less than 1,000 feet from the segment of the proposed project along Half Road. U.S. Highway 101 is located to the west and Anderson Reservoir is located east of the project area.

Other public agencies whose approval is likely required:	• City of Morgan Hill and County of Santa Clara – Local permits: encroachment permits, traffic control plans, etc. • State Water Resources Control Board – National Pollutant Discharge Elimination System (NPDES) Construction General Permit (General Permit) • California Department of Fish and Game (CDFW) - Fish and Game Code §1602 Lake and Streambed Alteration Agreement (LSAA) • U.S. Fish and Wildlife and CDFW - Incidental Take Authorization for activities in Santa Clara County through the Santa Clara Valley Habitat Conservation Plan & Natural Communities Conservation Plan (HCP/NCCP)

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agricultural 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	☐	Tribal Cultural Resources	☐	Utilities / Service Systems
☐	Mandatory Findings of Significance				

On the basis of this initial evaluation:

The District finds that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
The District finds that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	✓
The District finds that the proposed project MAY have a significant effect on the environment and an ENVIRONMENTAL IMPACT REPORT is required.	
The District finds that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	
The District finds that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

Signature

February 27, 2017
Date

Erika Carpenter
Environmental Planner II
Santa Clara Valley Water District

1. AESTHETICS

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista or designated scenic highway?				✓
b) Substantially damage publicly visible scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings?				✓
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?				✓

ENVIRONMENTAL SETTING

The visual character of the project area is rural in nature and is characterized by primarily rural residential uses, agricultural uses (e.g., fruit orchards), and Live Oak High School. The proposed project would be primarily located within the existing roadways of Cochrane Road, Half Road, and East Main Avenue. The northeastern portion of the project area includes a dense cover of Coast Live Oak, Blue Oak and Valley Oak trees that line both sides of Cochrane Road near the County Park entrance at Anderson Reservoir. The remaining trees within the project area are either landscape ornamentals or a naturalized species (e.g., Lombardy poplar and Black Walnut trees). A distinctive visual characteristic in the southern portion of the project area includes 53 Red ironbark trees, which border Live Oak High School on the south side of Half Road just west of Elm Road.

Regulatory Framework

The *City of Morgan Hill General Plan* includes goals and policies to protect visual resources and identifies specific gateways into the City in order to enhance the visual integrity of the city. These gateways include the Madrone area north of Cochrane Road, the Cochrane Road/Monterey Road intersection, Monterey Road south of Watsonville Road, the Cochrane, Dunne and Tennant freeway interchanges, and the railroad station located near Downtown Morgan Hill.

One of the primary strategies in the *County of Santa Clara General Plan* with respect to visual resources is the preservation of the rural character in the unincorporated areas of the County. The project area is not located within one of the designated gateways or scenic vistas identified in the *City of Morgan Hill General Plan* or the *County of Santa Clara General Plan*.

DISCUSSION

a) ***No Impact.*** The proposed project would replace the existing pipelines within the right-of-way of existing roadways including Half Road, Cochrane Road, and East Main Avenue, as well as demolition of a chemical feed station on Cochrane Road and reconstruction of the chemical feed station on East Main Avenue near the Main Avenue turnout. The proposed project would be visible from adjacent residential uses and public roadways in the project vicinity. However, the equipment required for pipeline demolition and

installation would only be visible temporarily during construction activities and would not result in a permanent change to the rural character of the project area.

After construction, the majority of the project elements (e.g., pipelines) would be underground within existing roadways and out of view. The project area is not located within one of the designated gateways identified in the *City of Morgan Hill General Plan* or the *County of Santa Clara General Plan*. As no scenic vistas or gateways have been identified in the project area, project elements such as the chemical feed station that are located above ground would not block or impair any scenic vistas in the project area. Therefore, the proposed project would have no impact on scenic vistas within the project area.

b) ***No Impact.*** Portions of the project area are visible from U.S. Highway 101. However, according to the *Caltrans Scenic Highway Program*, Highway 101 is not a designated or eligible state scenic highway in the vicinity of the project site (Caltrans 2016). Furthermore, the project area is not located adjacent to a scenic corridor designated in the *City of Morgan Hill General Plan* or *County of Santa Clara General Plan*. Therefore, the proposed project would have **no impact** to scenic resources within a state scenic highway.

c) ***Less than Significant Impact.*** Construction activities associated with the proposed project would be visible from adjacent residential uses and public roadways in the project vicinity. However, the equipment required for pipeline demolition and installation would only be visible temporarily during construction activities over approximately 17 months. The proposed project includes the demolition of an existing chemical feed station located along Cochrane Road and reconstruction of the structure along East Main Avenue near the Main Avenue turnout. The 299 square foot chemical feed station would result in a very small change in the visual character of the project area due to its size and surrounding rural character.

Construction activities would be adjacent to approximately 80 Coast Live Oak, Blue Oak and Valley Oak trees that align the east and west sides of Cochrane Road from Barnard Road to the northeastern limit of construction near the entrance to Anderson Reservoir. These trees contribute to the visual character of the project area. The proposed project does not include plans to remove the trees from the project area and is therefore not anticipated to substantially degrade the existing visual character of quality of the site and its surroundings, which would be considered a **less than significant impact**. In addition, Mitigation Measure BIO-1 (Implementation of Tree Protection Measures) has been proposed (See Subsection 4: Biological Resources) to further reduce and minimize any construction impact to trees such as root loss. This measure would require the incorporation of tree protection measures (e.g. establishing a tree protection zone from the tree base to the drip-line of the canopy) during construction activities to protect the trees from compaction and the removal of significant roots during pipeline installation

d) ***No Impact.*** Streetlights, vehicle head and tail lights, and lighting associated with existing development are the primary sources of light and glare in the project area. The proposed project would replace the existing pipelines within the right-of-way of existing roadways including Half Road, Cochrane Road, and East Main Avenue, as well as demolition of a chemical feed station on Cochrane Road and reconstruction of the chemical feed station on East Main Avenue near the Main Avenue turnout. Therefore, the proposed project would not install structures or appurtenances that would generate light or glare.

Construction activities would occur during the daytime from Monday through Friday from 8:00 AM to 5:00 PM. Therefore, the proposed project would not result in substantial light or glare which would adversely affect day or nighttime views in the area and therefore the proposed project would have **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP)

None required.

2. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	**Potentially Significant Issues**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, 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?				✓

ENVIRONMENTAL SETTING

The project area is rural in nature and is comprised of primarily rural residential and agricultural uses, including fruit orchards. The majority of the project area is located in the urban limit line of the City of Morgan Hill and the remainder is located in unincorporated Santa Clara County within the City's SOI. The proposed project would be primarily located within the existing roadways of Cochrane Road, Half Road, and East Main Avenue.
Regulatory Framework

California Farmland Mapping Program

The California Department of Conservation (DOC) established the *Farmland Mapping and Monitoring Program* (FMMP) in 1982 to assess the location, quantity, and quality of agricultural lands and conversion of these lands to other uses. Every even-numbered year, FMMP issues a Farmland Conversion Report. FMMP data are used in elements of some county and city general plans, in regional studies on agricultural land conversion, and in environmental documents as a way of assessing project-specific impacts on Prime Farmland.

According to the *Santa Clara County Important Farmlands Map,* prime farmland in the vicinity of the project area is located north of Half Road and east of Cochrane Road between Half Road and East Main Avenue. The remainder of the project area is classified as "Urban and Built-Up Land" and "Other Land" (Department of Conservation 2010).

Williamson Act

The Williamson Act, or California Land Conservation Act (California Government Code Section 51200 et seq.), is designed to preserve agricultural and open space land. It allows private landowners to enroll in contracts that voluntarily restrict land to agricultural and open space uses. In return, Williamson Act parcels receive a lower property tax rate consistent with agricultural and open space use instead of their market rate value.

According to the County of Santa Clara, there are no parcels under the Williamson Act in the project area (County of Santa Clara 2016).

California Timberland Productivity Act

The California Timberland Productivity Act (TPA) of 1982 (Government Code Sections 51100 et seq.) was enacted to help preserve forest resources. Similar to the Williamson Act, this program gives landowners tax incentives to keep their land in timber production. There are approximately 2,450 acres of land designated as a Timberland Production Zone (TPZ) in Santa Clara County (Department of Forestry and Fire Protection, 2002). The project area is not located forest land, timberland, or timberland zoned for timberland production.

DISCUSSION

a) ***No Impact.*** The proposed project would replace the existing pipelines within the right-of-way of existing roadways including Half Road, Cochrane Road, and East Main Avenue, as well as demolishing and reconstructing a chemical feed station on East Main Avenue near the Main Avenue Percolation Ponds. The proposed project includes three staging areas that would be located within fallow agricultural land along East Main Avenue near the Main Avenue Percolation Ponds; at the corner of Cochrane Road and Half Road; and

along Half Road near the end of the Madrone Pipeline near the Madrone Channel. With the exception of the staging area along East Main Avenue near the Main Avenue Percolation Ponds, which is the location of the proposed chemical feed station, the staging areas would be used temporarily and would not permanently affect any land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the proposed project would have **no impact** on prime farmland.

b) ***No Impact***. There are no parcels under a Williamson Act contract within the project area. Construction of the proposed chemical feed station would be located on a parcel that is designated for Agricultural use on the *County of Santa Clara Zoning Map*. However, the purpose of the proposed project is to provide groundwater recharge via the Main Avenue Recharge Ponds and the Madrone Channel, which benefits agricultural uses within the project area. In addition, the proposed chemical feed station would not prohibit surrounding agricultural uses from continuing to operate as it would not put sensitive receptors (e.g. residential, schools or other sensitive uses) in the vicinity of agricultural operations. Therefore, there would be ***no impact*** relating to conflict with existing zoning for agricultural use or a Williamson Act contract.

c - d) ***No Impact.*** The project area is not located on forest land, timberland, or timberland zoned as a TPZ. Therefore, **no impact** to forest lands would occur.

e) ***No Impact.*** The project area is rural in nature with agricultural uses (e.g. fruit orchards) and does not include any forestry uses in the project vicinity. The majority of the proposed project would occur within the existing roadways with exception of the reconstruction of a 299-square foot chemical feed station, which would occur on fallow agricultural land near the Main Avenue Percolation Ponds designated for Agricultural use on the *County of Santa Clara Zoning Map*. However, the purpose of the proposed project is to provide groundwater recharge via the Main Avenue ~~Recharge~~ Percolation Ponds and the Madrone Channel, which benefits agricultural uses within the project area. In addition, the proposed chemical feed station would not prohibit surrounding agricultural uses from continuing to operate as it would not put sensitive receptors (e.g. residential, schools or other sensitive uses) in the vicinity of agricultural operations. Therefore, the proposed project would have **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP)

None required.

3. AIR QUALITY

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of applicable air quality plan?				✓
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				✓
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?			✓	

An air quality and greenhouse gas analysis report was prepared by LSA in September 2016 to evaluate whether the proposed project would cause significant air quality or greenhouse gas impacts. The air quality and greenhouse gas analysis report is incorporated herein and included as Appendix A.

ENVIRONMENTAL SETTING

The project area is located within the San Francisco Bay Air Basin, which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). Regional and local air quality in the basin is impacted by topography, dominant airflows, atmospheric inversions, location, and season.

Both State and federal governments have established health-based Ambient Air Quality Standards for six criteria air pollutants including carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Reactive organic gases (ROG) are formed from combustion of fuels and evaporation of organic solvents. ROG is an ozone precursor and a prime component of the photochemical reaction that forms ozone. NO_x refers to the compounds of NO_2, a reddish-brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. NO_x is a primary component of the photochemical smog reaction. Fine suspended particulate matter ($PM_{2.5}$) has an aerodynamic diameter of 2.5 microns or less, and particulate matter (PM_{10}) which refers to coarse particles that are larger than 2.5 microns but smaller than 10 microns.

Toxic air contaminants (TACs) are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources from industrial plants to motor vehicles emit TACs. TACs are generally regulated through State and local risk management programs designed to eliminate, avoid, or minimize the risk of adverse health effects from exposure to TACs. The two TACs of concern for the proposed project are naturally occurring

asbestos (NOA) and diesel particulate matter (DPM). These are regulated by CARB with various airborne toxic control measures (ATCMs). These ATCMs are aimed at minimizing the risk of exposure.

Sensitive Receptors

Those who are considered sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. Therefore, sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. The nearest sensitive receptors include single family residential homes that are located approximately 40 feet from the proposed limits of construction, as well as Live Oak High School, which has classrooms/buildings located approximately 1,000 feet southeast of the construction area along Half Road.

Attainment Status

The California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A nonattainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An unclassified designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. Environmental Protection Agency (USEPA) also designates areas as attainment, nonattainment, or classified. The San Francisco Bay Area is classified as non-attainment under the State and Federal 8-hour ozone standard; non-attainment for both the annual arithmetic mean and the 24-hour standard for course particulate matter standard (PM_{10}) under the state standard; and non-attainment for fine particulate matter ($PM_{2.5}$) under the annual arithmetic mean under the state standard and non-attainment under the federal 24-hour standard.

Regulatory Framework

The USEPA and CARB regulate direct emissions from motor vehicles. The BAAQMD is the regional agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as monitoring ambient pollutant concentrations.

Federal Clean Air Act. The 1970 Federal Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

***California Clean Air Act*.** In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain CAAQS for carbon monoxide, ozone, sulfur dioxide and nitrogen dioxide by the earliest practical date. The California Clean Air Act provides districts

with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan (CAP) shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

Bay Area Air Quality Management District. In June 2010, the BAAQMD adopted significance thresholds for agencies to use to assist with environmental review of projects under the CEQA. These thresholds were designed to establish the level at which BAAQMD believed air pollutant emissions would cause significant impacts under CEQA. The BAAQMD's recommended significance thresholds are the subject of ongoing litigation. BAAQMD is no longer recommending that their thresholds be used as a generally applicable measure of project's significant air quality impacts; BAAQMD recommends that lead agencies determine appropriate air quality thresholds of significance based on substantial evidence in the record. (http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed January19, 2017).

The District has independently reviewed BAAQMD recommended thresholds from June 2010 including BAAQMD's Justification Report which explains the agency's reasoning for adopting the thresholds, and determined that they are supported by substantial evidence and are appropriate for use to determine significance in the environmental review of this project. Specifically, the District has determined that the BAAQMD thresholds are well-founded grounded on air quality regulations, scientific evidence, and scientific reasoning concerning air quality and greenhouse gas emissions. The BAAQMD recommended significance thresholds are provided in Table 4-1: BAAQMD Thresholds of Significance below.

Table 4-1: **BAAQMD Thresholds of Significance**

Emission Sources	**Pollutants (pounds/day)**			
	ROG	NOx	PM_{10}	$PM_{2.5}$
BAAQMD Thresholds of Significance	54	54	82	54
Source: BAAQMD 2012				

DISCUSSION

a) ***No Impact.*** The applicable air quality plan for the project area is the BAAQMD's 2010 *Clean Air Plan,* which was adopted on September 15, 2010. The Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defines a control strategy to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions to protect the climate. Consistency with the BAAQMD *Clean Air Plan* can be determined if the project does the following: 1) supports the goals of the Clean Air Plan; 2) includes applicable control measures from the Clean Air Plan; and 3) would not disrupt or hinder implementation of any control measures from the *Clean Air Plan*. Consistency with the transportation and

mobile source control measures, land use and local impact measures, and energy measures is described below:

- *Transportation and Mobile Source Control Measures*. The BAAQMD identifies control measures as part of the *Clean Air Plan* to reduce ozone precursor emissions from stationary, area, mobile, and transportation sources. The Transportation Control Measures are designed to reduce emissions from motor vehicles by reducing vehicle trips and vehicle miles traveled (VMT) in addition to vehicle idling and traffic congestion. The proposed project would repair and replace portions of the Main Avenue and Madrone pipelines and would not result in an increase in operational VMT once construction is complete. Therefore, the proposed project would not conflict with the transportation and mobile source control measures from the Clean Air Plan.

- *Land Use and Local Impact Measures.* The *Clean Air Plan* includes Land Use and Local Impacts Measures (LUMs) to achieve the following: promote mixed-use, compact development to reduce motor vehicle travel and emissions; and ensure that planned growth is focused in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. The proposed project would not conflict with the LUMs identified in the Clean Air Plan.

- *Energy Measures.* The *Clean Air Plan* also includes Energy and Climate Control Measures, which are designed to reduce ambient concentrations of criteria pollutants and reduce emissions of CO_2. Implementation of these measures is intended to promote energy conservation and efficiency in buildings, promote renewable forms of energy production, reduce the "urban heat island" effect by increasing reflectivity of roofs and parking lots, and promote the planting of (low-VOC-emitting) trees to reduce biogenic emissions, lower air temperatures, provide shade, and absorb air pollutants. The energy measures of the *Clean Air Plan* are not applicable to the proposed project.

As discussed above, implementation of the proposed project would not disrupt or hinder implementation of the applicable measures outlined in the *Clean Air Plan*, including Transportation and Mobile Source Control Measures, Land Use and Local Impact Measures, and Energy Measures and the proposed project would have **no impact**.

b) ***Less than Significant Impact.*** During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by demolition, excavation, hauling, and other activities. In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly. These emissions would be temporary and limited to the immediate area surrounding construction activities.

Construction-related effects on air quality from the proposed project would be greatest during the excavation, pipeline demolition, and paving phases. Construction emissions were calculated using RoadMod, which includes emission factors from CARB's EMFAC2011 and OFFROAD2011. Construction related emissions are presented in Table 4-2: Construction Emissions Associated with the proposed project.

Table 4-2: Construction Emissions Associated with the Proposed Project

Project Construction	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
	(pounds/day)			
Average Daily Emissions	3.1	32.5	40.4	0.4
BAAQMD Thresholds	54.0	54.0	82.0	54.0
Exceed BAAQMD Thresholds	No	No	No	No

Source: LSA Associates, Inc. 2016

As shown in Table 4-2: Construction Emissions Associated with the Proposed Project, construction emissions for ROG, NO_x, PM_{10} and $PM_{2.5}$ would be below BAAQMD thresholds of significance. Therefore the proposed project would result in a **less than significant impact**. The *BAAQMD's Air Quality Guidelines* recommend that projects reduce emissions of fugitive dust to less than significant levels through application of Fugitive Dust Control Best Management Practices. The proposed project includes implementation of District's BMP AQ-1 (Dust Control Measures) as included in Section 3 (Table 3), which would require dust control measures are implemented during construction activities associated with the proposed project.

Operational Emissions

Long-term air emission impacts are those associated with area sources and mobile sources involving any change related to the proposed project. Once the proposed project is operational, maintenance activities would remain the same as existing conditions and therefore the proposed project would not result in the generation of additional air emissions beyond the current baseline. Therefore, the proposed project would result in **no impact** to operational emissions.

Localized Carbon Monoxide

The proposed project would not generate additional vehicle trips over existing conditions for maintenance once the proposed project is operational. In addition, the proposed project would not conflict with the *Santa Clara Valley Transportation Authority's Congestion Management Plan* or other agency plans. Therefore, the proposed project would not result in localized CO concentrations that exceed State or federal standards, which would be considered a **less than significant impact**.

d) ***Less than Significant Impact.*** Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter (DPM) and substantial pollutant concentrations are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to DPM. Exposure from diesel exhaust associated with construction activity could contribute to both cancer and chronic non-cancer health risks.

During construction, various diesel-powered vehicles and equipment would be in use. In 1998, the ARB identified particulate matter from diesel-fueled engines as a TAC. The CARB has completed a risk management process that identifies potential cancer risks for a range of activities using diesel- fueled engines. High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (e.g.,

distribution centers and truck stops) were identified as having the highest associated risk.

Health risks from TACs are a function of both concentration and duration of exposure. Unlike the above types of sources, construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks, whereas health risks are based on a 70-year risk duration. Additionally, construction-related sources are mobile and transient in nature, and the emissions occur within the project area. The nearest sensitive receptors include low density residential homes located approximately 40 feet from the construction area, as well as Live Oak High School, which has buildings located approximately 1,000 feet southeast of the construction area along Half Road. Construction of the proposed project would be expected to occur for a duration of 17 months, which is considered relatively short relative to the 70 year health risk exposure analysis period, especially given that each receptor would only be exposed during a small period during the overall construction activities. In addition, as shown in Table 4-2, project construction PM_{10} exhaust emissions (the primary source of construction TAC emissions) would be 40.4 pounds per day which is below the BAAQMD's threshold for PM_{10} exhaust emissions. Implementation of the District's BMP AQ-1 (Dust Control Measures) as included in the project description in Section 3 (Table 3), would further reduce health risks from construction emissions of diesel particulate by limiting the amount of idling that would occur.

The proposed project includes demolition of the existing chemical feed station along Cochrane Road. Demolition of existing buildings is required to comply with BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing), which is intended to limit asbestos emissions from demolition or renovation of structures. This regulation requires that the BAAQMD be notified of any regulated renovation or demolition activity and includes a description of structures and methods utilized to determine whether asbestos-containing materials are potentially present. All asbestos-containing material found on the site must be removed prior to demolition or renovation activity, including specific requirements for surveying, notification, removal, and disposal of material containing asbestos. Therefore, as the proposed project would comply with applicable regulations regarding asbestos, any asbestos containing materials would be disposed of appropriately and safely and would result in a **less than significant impact** to nearby sensitive receptors.

The geotechnical report prepared for the proposed project does not identify any serpentine aggregate samples and based on the California Department of Conservation's *General Location Guide for Ultramafic Rocks in California,* the proposed project does is not located in an area likely to contain naturally occurring asbestos.

The BAAQMD Stationary Source Screening Analysis Tool was used to identify stationary sources and estimated risk and hazards to workers in the project vicinity. The screening analysis identified a nursery within 1,000 feet of the project construction areas, which was found to result in a cancer risk well below the BAAQMD toxic air contaminant thresholds. Therefore, workers within the project area would not be exposed to toxic air contaminants during construction activities, which would be a **less than significant impact.**

e) ***Less than Significant Impact****.* Odors are generally regarded as an annoyance rather than a health hazard and the ability to detect odors varies considerably and overall is

considered subjective. Once operational, the proposed project does not include any activities that would generate objectionable odors. However, during construction activities within the project area, odors may occur related to decaying organic material disturbed during the excavation or construction equipment, which would occur over a period of approximately 17 months. These odors are expected to be short-term and dispersed over a wide area. In addition, District BMP AQ-2 (Dust Control Measures) as included in the project description in Section 3 (Table 3) would require that odorous materials are handled in a manner that avoids impacting the surrounding receptors (e.g. single family homes or Live Oak High School). Therefore, the proposed project would not create objectionable odors affecting a substantial number of people and the impact would be considered **less than significant**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

AQ-1: Dust Control Measures
AQ-2: Avoid Stockpiling of Odorous Materials

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None required.

4. BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as 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 U.S. 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?		✓		

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

An evaluation of potential impacts to biological resources within the project area is based on a biological resources report conducted by H.T. Harvey and Associates that was prepared in October 2016 to evaluate whether any sensitive biological resources are located at the project site or vicinity (Appendix B). An assessment of trees along the project alignment was also conducted by a District certified arborist in September 2016.

ENVIRONMENTAL SETTING

The majority of the project area is located along developed roads (e.g. Half Road, Cochrane Road, East Main Avenue) for the replacement of existing pipelines. Potentially sensitive biological areas are located near the Main Avenue Percolation Ponds and the Madrone Channel, as well as in the northeastern portion of the project area where there are significant number of trees that line Cochrane Road.

Habitat

Habitat and land cover types within the project area are based upon the mapping conducted for the VHP with modifications based upon site conditions observed during the field survey conducted by H.T. Harvey and Associates in March 2016. Three biotic habitats and land uses were identified within the project area including the following:

- Grain, row-crop, hay and pasture, disked/short-term fallowed;
- Urban-suburban; and
- Pond.

The approximate area of each habitat type is shown in Table 4-3: Summary of Existing Land Cover Types Within the Project Area. The only aquatic features within the project area are the Main Avenue Percolation Ponds and the Madrone Channel.

Table 4-3: Summary of Existing Land Cover Types Within the Project Area

Existing Land Cover Types	Approximate Area (acres)
Grain, row-crop, hay and pasture, disked/short-term fallowed	1.13
Urban-suburban	8.11
Pond[2]	0.19
Total	**9.43**

Source: H.T. Harvey and Associates 2016

The dominant and characteristic plant and animal species for each of these habitats/land cover types are described below.

Grain, Row-crop, Hay and Pasture, Disked/Short-Term Fallowed. The grain, row-crop, hay and pasture, and disked/short-term fallowed land cover type is included under the "agriculture developed" natural community in the VHP. It encompasses irrigated and non-irrigated areas of tilled land that alternately are planted with row-crops or grains or are fallow. Non-native forbs and grasses (i.e. ruderal plant species) may begin to colonize areas that have been left as fallow during the growing season or remain barren for successive years.

Agricultural areas within the project area provide habitat for wildlife species similar to surrounding nonnative grassland habitats in the region, except that agricultural habitats are highly cultivated for specific species and regularly disturbed by farming activities. Small mammals such as Botta's pocket gophers (*Thomomys bottae*), California ground squirrels (*Spermophilus beecheyi*), and California mice (*Peromyscus californicus*) breed and forage in these fields, especially where the ground has not been recently disturbed and they can establish burrow complexes. These small mammals provide prey for red-tailed hawks (*Buteo jamaicensis*), barn owls (*Tyto alba*), grey foxes (*Urocyon cinereoargenteus*), gopher snakes (*Pituophis catenifer*), northern Pacific rattlesnakes (*Crotalus oreganus*), and other predators. Birds such as Canada geese (*Branta canadensis*), finches, sparrows, and blackbirds will forage on seeds in these fields, and red-winged blackbirds (*Agelaius phoeniceus*) may breed in fallow fields. However, the repeated disturbance causes these communities to change frequently, and the animal communities present will depend upon the management of individual fields.

Urban-Suburban. The urban-suburban land cover type is included under the "developed" natural community in the VHP. It encompasses areas where the majority of naturally occurring vegetation has been cleared for commercial, industrial, transportation, or recreational structures; in addition to associated paved and impermeable surfaces. The urban-suburban land cover type within the project area includes paved, dirt, and gravel roads. These areas may support a very low cover of non-native, ruderal vegetation, similar to that which occurs within adjacent rural residential; grain, row-crop, hay and pasture, and disked/short-term fallowed; and orchard land cover types.

[2] Main Avenue Percolation Ponds and Madrone Channel

Paved, dirt, and gravel roads do not provide high-quality wildlife habitat; however, snakes and lizards may bask on these surfaces and a wide variety of wildlife cross or move along these roads on the way to other habitats.

Pond. The five Main Avenue Percolation Ponds are located southwest of the corner of East Main Avenue and Hill Road. These man-made ponds are used by the District for groundwater recharge purposes, and the District can raise and lower water levels within the ponds and at times the ponds are drained dry or to very low levels for maintenance purposes. The District releases water into the ponds annually to recharge the groundwater basin. The ponds are periodically drained for maintenance purposes. The banks of this pond are steep and poorly vegetated.

The Main Avenue Percolation Ponds support several species of aquatic invertebrates such as backswimmers (*Notonectidae*), mayfly nymphs (*Ephemeroptera)*, dragonfly nymphs (*Anisoptera*), ramshorn snails (*Planobarius* spp.), and Belostomatid beetles. Common amphibians including Sierran chorus frogs (*Pseudacris sierrae*) and western toads (*Anaxyrus boreas*) breed in these ponds, and fish present include the prickly sculpin (*Cottus asper*) and inland silverside (*Menidia beryllina*). In addition, some emergent vegetation is present to provide nesting and foraging habitat for birds such as the marsh wren (*Cistothorus palustris*) and song sparrow (*Melospiza melodia*). The open water at the ponds provides foraging habitat for several species of ducks including the mallard (*Anas platyrhynchos*) and bufflehead (*Bucephala albeola*).

The Madrone Channel is a man-made channel is used by the District for groundwater recharge purposes. The District can raise and lower water levels within this channel to dry or to very low levels for maintenance purposes. The Madrone Channel is generally devoid of vegetation; however, non-native, ruderal plant species are present above the ordinary high water marks.

When water is present, the aquatic habitat in this channel may provide functions and values for aquatic wildlife, including aquatic invertebrates such as backswimmers, aquatic beetles, mayfly nymphs, dragonfly nymphs, leeches (subclass *Hirudinea*), and aquatic snails, as well as amphibians, such as the Sierran chorus frog, and fish. If water is allowed to remain in the channel for several months, amphibians such as the Sierran chorus frog and western toad may breed there.

Special Status Plant Species

The only special status plant species that had the potential for occurrence within the project area was Congdon's tarplant (*Centromadia parryi ssp. congdonii*), which is categorized as California Native Plant Society as Rank 1B:1. Congdon's tarplant is an annual herb in the composite family (*Asteraceae*) that is endemic to California. It has a variable blooming period extending from May through November and occurs in valley and foothill grassland habitat, floodplains, and swales. A focused survey for Congdon's tarplant was conducted within the project area on August 2, 2016 within suitable habitat and it was not detected. Therefore, this species is determined to be absent from the project area.

Special Status Animal Species

Bay checkerspot butterfly (*Euphydryas editha bayensis*), Central California Coast steelhead (*Oncorhynchus mykiss*), least Bell's vireo (*Vireo bellii pusillus*), San Joaquin kit fox (*Vulpes macrotis mutica*), Townsend's big-eared bat (*Corynorhinus townsendii*), Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*), foothill yellow-legged frog (*Rana boylii*),

Swainson's hawk (*Buteo swainsoni*), long-eared owl (*Asio otus*), short-eared owl (*Asio flammeus*), yellow-breasted chat (*Icteria virens*), grasshopper sparrow (*Ammodramus savannarum*), San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), western red bat (*Lasiurus blossevillii*), and ringtail (*Bassariscus astutus*) are absent from the project area due to a lack of suitable habitat.

The Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus cooperi*), northern harrier (*Circus cyaneus*), loggerhead shrike (*Lanius ludovicianus*), and yellow warbler (*Setophaga petechia*), are considered California species of special concern when nesting and may occur within the project area as nonbreeding transients, foragers, or migrants. However, none of these species has been recorded nesting in or within close proximity to the project area and they do not typically breed in the habitat types present within the project area. Because these species are only considered species of special concern when nesting, they are not "special-status species" when they occur as non-breeding visitors.

The bank swallow (*Riparia riparia*), bald eagle (*Haliaeetus leucocephalus*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), western red bat (*Lasiurus blossevillii*), golden eagle (*Aquila chrysaetos*), and American peregrine falcon (*Falco peregrinus anatum*) are state listed and/or state fully protected year-round and may occasionally occur within the project area as non-breeding migrants, transients, or foragers, but they are not known or expected to breed, to occur regularly, or to occur in large numbers within the project area. Because these species occur within the project area only infrequently and/or in small numbers, and as nonbreeders, they are not considered potentially occurring in the area.

Special status species that are known to breed or could potentially breed on or in the project vicinity include the following: California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), tricolored blackbird (*Agelaius tricolor*), western pond turtle (*Actinemys marmorata*), American badger (*Taxidea taxus*), pallid bat (*Antrozous pallidus*), and white-tailed kite (*Elanus leucurus*).

Trees

The District prepared a tree assessment of the project area in September 2016. As shown in Table 4-4: Tree Species in the Project Area, there are 152 trees located in the project area that were evaluated by the District's Certified Arborist. Tree species in the project area include a mixture of California natives, landscape ornamentals, and naturalized/invasive species. Coast live oak was the most common species encountered during the assessment, while red ironbark, the second most common, was only found in the western portion of the project area on Half Road adjacent to Live Oak High School.

Table 4-4: Tree Species in the Project Area

Common Name	Scientific Name	Total by Species
Native Trees		
Coast live oak	*Quercus agrifolia*	81
Blue oak	*Quercus douglasii*	4
Valley oak	*Quercus lobata*	9
Non-native Trees		
Red ironbark	*Eucalyptus tricarpa*	53
Lombardy poplar	*Populus nigra*	3
Olive	*Olea europaea*	1
Black walnut	*Juglans* sp.	1
	Total	152

Regulatory Framework

Biological resources within the project area are protected by numerous federal and state regulations, including the Clean Water Act, Federal Endangered Species Act, Migratory Bird Treaty Act, California Endangered Species Act, Native Plant Protection Act, and California Fish and Game Code. Regulations for biological resources are also established at the local level by the Santa Clara Valley Habitat Plan, the City of Morgan Hill, and the County of Santa Clara.

Federal Endangered Species Act (FESA). The FESA (16 U.S. Government Code (USC) Sec. 1531 et seq.) protects fish and wildlife species that are listed as threatened or endangered and their habitats. Endangered refers to species, subspecies, or distinct population segments that are in danger of extinction in all or a significant portion of their range. Threatened refers to species, subspecies, or distinct population segments that are considered likely to become endangered in the future. The FESA is administered by the USFWS for terrestrial and freshwater species and by the National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NMFS) for marine species and anadromous fishes. The FESA prohibits "take" of any fish or wildlife species listed by the federal government as endangered or threatened.

Santa Clara Valley Habitat Plan (VHP). The proposed project is a covered activity in the *Santa Clara Valley Habitat Plan* (VHP), which is a joint habitat conservation plan and natural communities conservation plan developed to serve as the basis for the issuance of incidental take permits and authorizations pursuant to Section 10 of the federal Endangered Species Act and the California Natural Community Conservation Planning Act. To certify take for covered species, activities associated with the proposed project must be implemented consistent with conditions and avoidance and minimization measures (AMMs) outlined in the VHP.

Migratory Bird Treaty Act (MBTA). The MBTA (16 USC Sec. 703–712 et seq.) enacted the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate take of migratory birds. The MBTA is administered by USFWS. It establishes seasons and bag limits for hunted species, and renders taking, possession, import, export, transport, sale, purchase, and barter of migratory birds, their occupied nests, and their eggs illegal except where authorized under the terms of a valid federal permit. Activities for which permits may be issued include scientific collecting; falconry and raptor propagation; "special purposes," which include rehabilitation, education, migratory game bird propagation, and miscellaneous other activities; control of

depredating birds; taxidermy; and waterfowl sale and disposal. More than 800 species of birds are protected under the MBTA. Specific definitions of migratory bird are discussed in each of the international treaties; in general, however, species protected under the MBTA are those that migrate to complete different stages of their life history or to take advantage of different habitat opportunities during different seasons.

***The Bald and Golden Eagle Protection Act*.** The Bald and Golden Eagle Protection Act (16 USC Sec. 668 et seq.) makes it unlawful to import, export, take, sell, purchase, or barter any bald eagle or golden eagle, or their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbance. Exceptions may be granted by the USFWS for scientific or exhibition use, or for traditional and cultural use by Native Americans. However, no permits may be issued for import, export, or commercial activities involving eagles

***California Endangered Species Act (CESA)*.** CESA protects wildlife and plants listed as threatened and endangered by the California Fish and Game Commission, as well as species identified as candidates for such listing. It is administered by the CDFW. CESA requires state agencies to conserve threatened and endangered species (Sec. 2055) and thus restricts all persons from taking listed species except under certain circumstances. CESA defines take as any action or attempt to "hunt, pursue, catch, capture, or kill." Under certain circumstances, CDFW may authorize limited take, except for species designated as fully protected (see discussion of fully protected species under California Fish and Game Code below). The requirements for an application for an incidental take permit under CESA are described in Section 2081 of the California Fish and Game Code and in final adopted regulations for implementing Sections 2080 and 2081.

***California Fish and Game Code*.** The California Fish and Game Code provides protection from take for a variety of species, separate from and in addition to the protection afforded under CESA. The Code defines take as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Species identified in the Code as fully protected may not be taken except for scientific research. Fully protected species are listed in various sections of the Code. For instance, fully protected birds in general are protected under Section 3511, nesting birds under Sections 3503.5 and 3513, and eggs and nests of all birds under Section 3503. Birds of prey are addressed under Section 3503.5. All other birds that occur naturally in California and are not resident game birds, migratory game birds, or fully protected birds are considered non-game birds and are protected under Section 3800. Section 3515 lists protected fish species and Section 5050 lists protected amphibians and reptiles. Section 4700 identifies fully protected mammals.

***Tree Ordinances*.** Tree ordinances in the County of Santa Clara and City of Morgan Hill would be applicable to the proposed project.

- *County of Santa Clara Municipal Code. Title C, Division C16: Tree Preservation and Removal* of the *County of Santa Clara Municipal Code* defines the tree removal process in unincorporated Santa Clara County. Trees subject to the Municipal Code include the following: trees that have a main trunk or stem measuring 12 inches or more in diameter at a height of 4.5 feet above ground level, or in the case of multi-trunk trees a total of 24 inches or more of the diameter of all trunks on parcels that are zoned "Hillsides" within the planning area.

- *City of Morgan Hill Municipal Code.* Section 12.32.030 of the *City of Morgan Hill Municipal Code* defines the tree removal permit process in the City. Trees subject to the Municipal Code include the following: existing trees rising above the ground with a single stem or trunk of a circumference of 40 inches or more for non-indigenous species and 18 inches or more for indigenous species (native to Morgan Hill region, including oaks, California bay, madrone, sycamore, and alder) measured at four and one-half feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes; trees of any size within the public right-of-way; and/or trees that are important to the historical or visual aspect of Morgan Hill.

DISCUSSION

a) ***Less than Significant Impact.*** Special status species that are known to breed or could potentially breed on or in the project vicinity include: California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), tricolored blackbird (*Agelaius tricolor*), western pond turtle (*Actinemys marmorata*), American badger (*Taxidea taxus*), pallid bat (*Antrozous pallidus*), and white-tailed kite (*Elanus leucurus*). Impacts of the proposed project on these species is described below:

California Tiger Salamander. The California tiger salamander (CTS) is a "threatened" species under FESA, a "Species of Special Concern" under CESA and is a covered species in the VHP. Suitable breeding habitat for CTS consists of temporarily ponded environments (e.g., vernal pool, ephemeral pool, or human-made pond) that hold water for a minimum of three to four months and that are surrounded by uplands supporting small mammal burrows. There is no evidence that CTS breed in the Main Avenue Percolation Ponds or the Madrone Channel regularly or that they have bred in these ponds in recent years and the VHP does not map the Main Avenue Percolation Ponds or the Madrone Channel as suitable breeding habitat for CTS. However, a desiccated juvenile tiger salamander was found in the bottom of one of the Main Avenue Percolation Ponds in 2010. Therefore, there is the possibility that CTS may occasionally breed or disperse in the Main Avenue Percolation Ponds and the Madrone Channel may provide suitable breeding habitat for CTS when it contains water. However, they are not expected to breed in the channel due to a lack of evidence of previous breeding and a lack of potential breeding ponds within suitable dispersal distance (i.e., 1.3 miles).

The VHP maps portions of the project area as suitable upland dispersal and refugial habitat for CTS and there is some potential for the species to occur in the grain, row-crop, hay, and pasture, disked/short-term fallowed habitat in Staging Area 1 near the Anderson Lake County Park. However, due to the regular disturbance of the agricultural fields, these areas and all three staging areas do not provide large numbers of subterranean refugia for CTS.

The majority of the proposed project would occur on paved roadways, which does not provide suitable upland or aquatic habitat for CTS. Due to the low quality of potential breeding habitat and the low number of subterranean refugia within the project area, the proposed project would not affect large numbers of individuals or habitat. However, if CTS are present during construction activities, individuals could be at risk for injury or mortality. The proposed project would comply with VHP Condition 3: Maintain Hydrologic Conditions and Protect Water Quality, which requires implementation of numerous aquatic avoidance and minimization measures (Table 6-2 of the VHP) such as source and treatment control to prevent pollutants from leaving the construction site and minimizing site erosion. The proposed project also incorporates District BMPs, including:

BI-2 (Avoid Animal Entry and Entrapment), which requires that all pipes, hoses, or similar structures less than 12 inches in diameter are closed or covered to prevent animal entry; BI-3 (Minimize Predator Attraction), which requires that trash is removed daily from the worksite to avoid attracting potential predators; WQ-2 (Limit Impacts from Staging and Stockpiling Materials), which requires conditions to avoid runoff from stockpiles during construction; and WQ-6 (Prevent Water Pollution), which requires measures to prevent stormwater pollution and erosion within the project area. Implementation of the District BMPs as part of the proposed project would ensure that the impact to CTS would be **less than significant**.

California Red-Legged Frog. California red-legged frog (CRLF) is a "threatened" species under FESA and "threatened" under CESA. CRLF typically inhabit perennial freshwater pools, streams, and ponds, but their preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters, as well as shallow benches to act as nurseries for juveniles. Non-breeding frogs are typically found adjacent to streams and ponds in grasslands and woodlands and may travel up to two miles from their breeding locations across a variety of upland habitats.

The Main Avenue Percolation Ponds and ponded areas of the Madrone Channel may provide suitable breeding habitat for CRLF and the Main Avenue Percolation Ponds are mapped as potential breeding habitat for this species by the VHP. However, aquatic surveys in 2012 and 2014 of the Main Avenue Percolation Ponds did not detect any individuals of this species. Potentially breeding ponds are located at the base of Anderson Reservoir and near Cochrane Road within dispersal distance of the project area. However, CRLF are not expected to disperse from the base of Anderson Reservoir within the project area due to the surrounding highly disturbed agricultural habitat and roadways present between activity areas. Thus, CRLF are determined to be absent from the Main Avenue Percolation Ponds and Madrone Channel and the species is not expected to breed within the project area.

Due to the low likelihood that CRLF occur within the project area, the lack of potential breeding habitat, and low number of subterranean refugia, the proposed project is not expected to affect high-quality CRLF habitat, nor would it affect large numbers of individuals. In the unlikely event that CRLF are present during construction activities, individual CRLF may be harmed or killed. As described above, the proposed project incorporates VHP Condition 3: Maintain Hydrologic Conditions and Protect Water Quality, which requires implementation of numerous aquatic avoidance and minimization measures (Table 6-2 of the VHP). In addition, the proposed project incorporates District BMPs including BI-2 (Avoid Animal Entry and Entrapment), BI-3 (Minimize Predator Attraction), WQ-2 (Limit Impacts from Staging and Stockpiling Materials), and WQ-6 (Prevent Water Pollution). Implementation of these measures as part of the proposed project would ensure that the impact to CRLF would be **less than significant**.

Western Pond Turtle. Western Pond Turtle (WPT) is considered a "Species of Special Concern" by CDFW. Suitable habitat for the western pond turtle (WPT) consists of ponds or in-stream pools (i.e., slack water environments) with available basking sites, nearby upland areas with clay or silty soils for nesting, and shallow aquatic habitat with emergent vegetation and invertebrate prey for juveniles. The VHP maps the Main Avenue Percolation Ponds as primary habitat and surrounding agricultural areas as secondary habitat for WPT, but does not identify the Madrone Channel as habitat.

The Main Avenue Percolation Ponds may provide relatively deep perennial aquatic foraging habitat for WPT. The Madrone Channel also provides potential deep foraging

habitat for WPT when it contains water. However, the managed status of these ponds over the long-term (i.e., subject to raised or lowered water levels depending on management needs) reduces the suitability of these habitats. Western pond turtles are not known to occur in the Main Avenue Percolation Ponds or the Madrone Channel, and focused surveys of these habitats conducted in 2012 did not detect the species, likely due to the isolation of these ponds from other occurrences of the species in the area. The nearest record of WPT in the vicinity of the project area is at Anderson Reservoir, approximately 0.1 of a mile from the northernmost end of the project area to 1.6 miles from the Madrone Channel from the southernmost end of the project area. Western pond turtles are not expected to disperse from this location to the Main Avenue Percolation Ponds or the Madrone Channel due to the highly disturbed agricultural habitat and roadways present between these areas. Nevertheless, although the project area is not expected to support breeding populations of western pond turtles, they cannot be ruled out for potentially occurring at the Main Avenue Percolation Ponds of the Madrone Channel within the project area.

In the unlikely event that WPT are present during construction activities, individual turtles may be harmed or killed. Although western pond turtles are widespread in the project region, the species is not particularly abundant, and the loss of individuals could reduce the viability of a population to the extent that it would be eliminated. As described above, the proposed project incorporates VHP Condition 3: Maintain Hydrologic Conditions and Protect Water Quality, which requires implementation of numerous aquatic avoidance and minimization measures (Table 6-2 of the VHP), as well as District BMPs including: BMP BI-2 (Avoid Animal Entry and Entrapment), BI-3 (Minimize Predator Attraction) WQ-2 (Limit Impacts from Staging and Stockpiling Materials) and BMP WQ-6 (Prevent Water Pollution. Implementation of these measures as part of the proposed project would ensure that the impact to western pond turtle would be **less than significant**.

American Badger. There is a low probability of the American badger, which is a California species of special concern, occurring within the project area. If individuals do occur within the project area during construction activities, there is some potential for individuals to suffer injury or mortality during the construction process. However, the potential is low due to the lack of high-quality, undisturbed grassland in the project vicinity. As a result, the probability of injury or mortality of any badgers during construction is very low. Therefore, the proposed project would not have substantial effects on regional populations of badgers and this impact is determined to be **less than significant**.

Pallid Bat. The pallid bat, which is a California species of special concern, may be present on the project area as an occasional forager, but it is not expected to breed due to a lack of artificial structures with suitable roost sites or trees with suitably large cavities for roosting. A maternity colony supporting between 160 and170 individuals in a barn southwest of Cochrane Road near the base of Anderson Dam has been monitored since 1998, and individuals from this colony could potentially forage within the project area in open areas. In addition, an old barn adjacent to Staging Area 3 on East Main Avenue provides potential roosting habitat for this species.

Minor impacts on agricultural habitats within the project area would result in the loss of some foraging habitat and prey production areas for pallid bat. However, given the extent of such habitats regionally, the proposed project would not substantially affect local or regional pallid bat habitat and populations during construction activities. Therefore, this impact would be considered **less than significant**.

White tailed kite and Non-Breeding Special Status Bird Species. The only special status bird species that has the potential to nest in the project vicinity is the white-tailed kite, which is a state fully protected species. The proposed project would result in a very minor loss of upland habitats within the project area that provide suitable nesting habitat for white-tailed kite. This habitat represents a small proportion of the habitats that support this species regionally. Therefore, the loss of potential nesting habitat would be considered a **less than significant impact**.

Other special status bird species that may also occur in the project area as non-breeding migrants, transients, and foragers (e.g. bank swallows, Bryant's savannah sparrow, American peregrine falcon, golden eagle, and tricolored blackbird), which could potentially nest and forage in the project area. The bank swallow (state listed as endangered) is not expected to nest within the project area due to a lack of suitable habitat, but may occur as a rare migrant. Bryant's savannah sparrow (a California species of special concern) is not expected to breed within the project area due to a lack of suitable breeding habitat. However, during the non-breeding season, individuals may forage in open areas. The golden eagle and American peregrine falcon (both fully protected species) are not expected to breed within the project area due to a lack of suitable nesting habitat. Individuals of these species may occasionally occur within the project area while foraging, but are not expected to occur regularly.

The VHP maps potentially suitable nesting habitat for tricolored blackbirds in the Main Avenue Percolation Ponds. However, the species is not known to nest at this location. Further, only very narrow strips of emergent vegetation are present on the edges of these ponds due to regular District maintenance activities and this vegetation is not sufficient to support a nesting colony of this species. Therefore, the tricolored blackbird is not expected to nest within the project area. Individual tricolored blackbirds may forage throughout the site in small numbers during the non-breeding season, although no high-quality foraging habitat is present.

However, construction activities would occur during the nesting season (February 1 to August 31), which have the potential to affect nesting white-tailed kites or other non-breeding special status birds by causing adults to abandon eggs or recently hatched young. The proposed project includes implementation of District BMP BI-1 (Nesting birds are protected by state and federal laws) to avoid and minimize impacts to these special status bird species as described in Section 3 (Table 3). BMP BI-1 entails conducting a nesting bird survey prior to the start of construction in order to protect active nests if present during construction. If active bird nests that are protected by the Migratory Bird Treaty Act and/or California Fish and Game code (which includes active white-tailed kite nests) are found during the surveys, a construction free buffer will be established and maintained around the nest until the young have fledged or the nest is inactive. Implementation of this District BMP, as well as VHP Condition 1: Avoid Direct Impacts on Legally Protected Plant and Wildlife Species, which restricts work to the non-nesting season or conducting pre-construction surveys, and maintaining appropriate buffers to protect white tailed kites and other migratory birds, would ensure that impacts to white-tailed kites and other migratory birds are **less than significant**.

b) ***Potentially Significant Unless Mitigation Incorporated.*** Construction activities could have a potentially significant impact on water quality within the Main Avenue Percolation Ponds, the Madrone Channel, or downstream of the Madrone Channel, which occasionally discharges into East Little Llagas Creek. These activities could affect the

Main Avenue Percolation Ponds and the Madrone Channel, which are considered "Waters of the State," as well as the riparian habitat in East Little Llagas Creek.

The proposed project would result in temporary impacts to Waters of the State related to the installation of the new energy dissipaters within the Madrone channel and the Main Avenue Percolation Ponds. Depending on the water levels when they are installed, dewatering may be required at the Madrone Channel and at the Main Avenue Percolation Ponds. Both the Madrone Channel and the Main Avenue Percolation Ponds have hydrology that is controlled as part of routine maintenance and operation activities conducted by the District, including occasional dewatering of sections of the channel and various ponds by opening and closing valves. Because of these ongoing maintenance activities, dewatering of the Madrone Channel and Main Avenue Percolation Ponds would not be an isolated occurrence. In addition, project activities in the channel and the ponds would be required to comply with applicable regulatory requirements.

Construction activities associated with the proposed project could include an increase in sedimentation from working in adjacent areas and allowing disturbed soils to enter the ponds and/or the channel, or increases in water turbidity from working in wetted environments with unconsolidated (non-hardscaped) bottoms or banks. Such water quality effects could spread downstream from the Madrone Channel within the watershed if not avoided, potentially resulting in degradation of the health of aquatic species and downstream habitats in East Little Llagas Creek.

The proposed project includes the following District BMPs as described in the Project Description in Section 3 to minimize impacts on water quality: HM-1 (Restrict Vehicle and Equipment Cleaning to Appropriate Locations) and HM-2 (Ensure Proper Vehicle and Equipment Fueling and Maintenance), which require that vehicles and equipment are washed only in approved areas and that no fueling or servicing occurs in a waterway or immediate floodplain; and HM-3 (Ensure Proper Hazardous Materials Management) and HM-4 (Utilize Spill Prevention Measures), which include measures to ensure that hazardous materials are properly handled and the quality of water resources is protected, including the incorporation of spill prevention measures to prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water. The proposed project also includes the following water quality BMPs including: WQ-2 (Limit Impacts from Staging and Stockpiling Materials) and WQ-3 (Stabilize Construction Entrances and Exits), which require measures to minimize soil from being tracked onto streets near work sites; WQ-4 (Use Seeding for Erosion Control, Weed Suppression, and Site Improvement), which requires disturbed areas are seeded with native seed as soon as it is appropriate after activities are complete; WQ-5 (Maintain Clean Conditions at Work Sites), which requires that the work sites and access roads are maintained in an orderly condition; WQ-6 (Prevent Water Pollution), which requires oily, greasy, or sediment laden substances or other material that originates from project operations are not be allowed to enter or be placed where it may enter a waterway; WQ-7 (Prevent Water Pollution), which requires that measures be implemented to prevent stormwater pollution; and WQ-8 (Manage Sanitary and Septic Waste), which requires that temporary facilities are located on the job site to manage sanitary and septic waste. In addition, the project would comply with all applicable VHP conditions, including Conditions 3: Maintain Hydrologic Conditions and Protect Water Quality and Condition 12: Wetland and Pond Avoidance. Condition 3 requires implementation of design phase, construction phase, and post-construction phase measures, including programmatic BMPs, performance standards, and control measures, to minimize increases of peak discharge of storm drain water and to reduce runoff of pollutants to protect water quality, including during construction. VHP Condition 12 requires the implementation of design phase and construction phase measures to avoid and minimize impacts on wetlands and ponds,

including erosion control measures, fencing of avoided wetlands during construction, establishment of buffers between wetlands and refueling areas, and measures to minimize the spread of invasive species. However, the impact would still be considered **potentially significant** due to potential erosion from dewatering of the pipeline within the project area.

Mitigation Measures WQ-1(Monitor Discharge Rates); WQ-2 (Implementation of Erosion Control Measures) and WQ-3 (Monitor Discharge Locations for Erosion) (see text below) are proposed to further reduce the potentially significant water quality impact from potential dewatering of pipelines within the project area. These mitigation measures require the District to gradually increase discharge rates, implement erosion control measures, and monitor discharge locations for erosion if dewatering of the pipeline becomes necessary during construction activities. Implementation of these mitigation measures would reduce the potential water quality impacts to riparian habitat to a **less than significant level**.

c) ***Less than Significant Impact.*** Impacts on the Madrone Channel and the Main Avenue Percolation Ponds would occur during some construction activities associated with the proposed project as described above. The Madrone Channel and Main Avenue Percolation Ponds are man-made groundwater percolation facilities and are considered Waters of the State. The project area does not contain any streams, ponds, wetlands, or other aquatic features potentially subject to Corps jurisdiction under Section 404 of the federal Clean Water Act. Therefore, impacts on wetlands or other waters of the United States would be **less than significant**.

d) ***Less than Significant Impact***. Environmental corridors are segments of suitable habitat that provide connectivity between larger areas of suitable habitat, allowing species to disperse through otherwise unsuitable areas. The project area is not located within a particularly important corridor for wildlife movement (e.g. agricultural and low density residential habitat). The Madrone Channel does not provide a continuously vegetated corridor that terrestrial wildlife can use as cover while moving between habitats in the region. In addition, the intermittent nature of Madrone Channel (due to periodic drawdowns by the District for groundwater recharge purposes) means it does not provide an important movement corridor for aquatic species. However, construction activities may result in a temporary, and very small-scale and localized, impediment to wildlife movement in the project area. The proposed project does not include any structures or features that would result in long-term impediments to wildlife movement. Construction activities include the staging of materials, including large and small pipes that could present a potential hazard to animals passing through the area. The District would implement BMP BI-2 (Avoid Animal Entrapment), which requires the contractor to survey and secure all construction pipes, culverts or similar structures at the construction site at the close of each day, to prevent impacts associated with animal entrapment. The District would also implement BMP BI-3 (Minimize Predator Attraction), which requires the contractor to remove trash daily from the worksite, to avoid attracting potential predators to the site that could prey on wildlife passing through the project area.

The proposed project is not expected to substantially impact movement by wildlife and aquatic species, as use of the project area by species associated with wetter habitats (such as amphibians) is already low due to the intermittent nature of the Madrone Channel and general lack of aquatic and riparian vegetation. Therefore, the project area would retain its value for wildlife movement after construction of the proposed project is

complete, as no new barriers to wildlife movement would be constructed. Therefore, this impact would be considered **less than significant.**

e) ***Potentially Significant Impact Unless Mitigation Incorporation.*** There are approximately 80 native oak trees, including Coast Live Oak, Blue Oak, and Valley Oak trees in the northeastern portion of the project area along Cochrane Road from Barnard Road to the northeastern limit of construction near the entrance road to Anderson Reservoir located in unincorporated Santa Clara County, which could be affected by construction activities (See Figure 7: Significant Trees Within The Project Area). These trees are considered significant in accordance with *Title C, Division C16: Tree Preservation and Removal of the County of Santa Clara Municipal Code*. There are no trees located in the City of Morgan Hill that would be affected by the proposed project. Although no trees are proposed for removal under the proposed project, based on the proximity of these trees to the limits of construction, roots may be located beneath the road surface and could experience root loss due to soil disturbance and compaction from the narrow work area in this portion of the project area, which could result in the loss of trees within the project area. Healthier trees are more likely to recover from root loss or compaction during construction activities. Potential tree loss of trees considered significant under the *County of Santa Clara Municipal Code* would be considered a **potentially significant impact**.

Implementation of Mitigation Measure BIO-1: Implementation of Tree Protection Measures would reduce this potentially significant impact to a **less than significant level** to prevent tree loss by implementing tree protection measures (e.g. establishing a tree protection zone from the tree base extending to the drip line of the canopy) to ensure that surrounding trees maintain their health and vitality during construction activities.

f) ***No Impact.*** The proposed project is located within the boundaries of the *Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan (VHP)* and is considered a “Rural Capital Project,” which is a covered activity under the VHP. As a result, the applicable VHP conditions would have to be followed during project implementation. Those measures are identified in Section 3 of this document. The proposed project is consistent with the goals and objectives identified in VHP. Thus, the proposed project does not present any conflicts with any provisions of an adopted HCP/NCCP or other conservation plan and would have **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

B1-1: Nesting Birds are Protected by State and Federal Laws
B1-2: Avoid Animal Entry and Entrapment
B1-3: Minimize Predator Attraction
HM-1: Restrict Vehicle and Equipment Cleaning to Appropriate Locations
HM-2: Ensure Proper Vehicle and Equipment Fueling and Maintenance
HM-3: Ensure Proper Hazardous Materials Management
HM-4: Utilize Spill Prevention Measures
WQ-1: Conduct Work from Top of Bank
WQ-2: Limit Impacts from Staging and Stockpiling Materials
WQ-3: Stabilize Construction Entrances and Exits
WQ-4: Use Seeding for Erosion Control, Weed Suppression, and Site Improvement
WQ-5: Maintain Clean Conditions at Work Sites
WQ-6: Prevent Water Pollution

WQ-7: Prevent Water Pollution
WQ-8: Manage Sanitary and Septic Waste

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

MM BIO-1 ***Implementation of Tree Protection Measures*****.** The District shall implement the following tree protection measures during construction activities in the northeastern portion of the project area from Barnard Road on Cochrane Road to the northeastern limit of construction at the entrance to Anderson Reservoir (Figure 7: Significant Trees in the Project Area). These measures would ensure that the native oak trees in the northeastern portion of the project area are protected during construction activities.

- Establish a "Tree Protection Zone" during construction, including the area from at least the tree base extending to the drip line of the canopy. Temporary storage of excavated material shall not be made in the Tree Protection Zone. No grading, compaction, or operation of heavy equipment within the Tree Protection Zone may occur at any time.
- Avoid and preserve larger roots (> 2' diameter) where possible in the construction area.
- If larger roots cannot be avoided, roots should be severed with a clean, sharp implement (pruning saw, lopers). Large roots that are cut should be kept moist using wet burlap or similar until the project is complete and backfilled.
- If any pruning of larger limbs (≥4" diameter) or large roots (≥ 2" diameter) is required within the construction area, it shall be approved by a Certified Arborist.
- Where roots are encountered in the excavation area, efforts to keep the roots moist and minimize exposure to direct sun or heat should be made. This could include using burlap, nylon tarps, plywood, or similar barrier to protect the exposed roots during construction.
- To the extent feasible, construction activities shall occur during the second half of the year, between August and December, outside of the growing season when tree growth and development has declined.

MM WQ-1: ***Monitor Discharge Rates.*** If pipelines need to be discharged, the District shall ramp discharge rates slowly such that the increase in flow rate in the receiving water is gradual and scouring of the channel bed and banks does not occur.

MM WQ-2: ***Implementation of Erosion Control Measures.*** To protect exposed soils from erosion during pipeline dewatering, the District shall place erosion control blankets, mats, or geotextiles over the erodible surfaces. Any erosion control materials used within the channel or percolation ponds during discharges shall be removed immediately upon completion of water discharges. No plastic or monofilament netting shall be used on any erosion control materials. Flows shall be diverted around sensitive, actively eroding, or extremely steep areas to prevent erosion.

MM WQ-3: ***Monitor Discharge Locations for Erosion.*** The District shall monitor the discharge locations for signs of erosion. If erosion is evident, flow rates shall be reduced. If erosion continues to occur, discharges will be terminated until appropriate erosion control measures are implemented.

Figure 7: Significant Trees Within the Project Area

5. CULTURAL RESOURCES

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical or archaeological resource as defined in 15064.5?		✓		
b) Directly or indirectly destroy a unique paleontological resource or site?		✓		
c) Disturb any human remains, including those interred outside of dedicated cemeteries?			✓	

This section is based on a cultural resources study prepared for the proposed project in June 2016 by LSA Associates, Inc., as well as a search of the University of California Museum of Paleontology (UCMP) database that includes recorded fossil locations in Santa Clara County.

ENVIRONMENTAL SETTING

Cultural Resources

Archival and background research was conducted by LSA to identify cultural resources within and in the vicinity of the project area. The background research consisted of a records search at the Northwest Information Center at Sonoma State University (NWIC); a review the Sacred Lands File at the Native American Heritage Commission (NAHC) in Sacramento; a literature review; and a historical and geological map review.

The record search did not identify any archaeological cultural resources within the project area; however, two prehistoric cultural resources, one historic-period resource, and one multi-component cultural resource have been recorded within a quarter mile of the northeastern portion of the project area. The majority of the project area has been paved and the majority of the native ground surface that may contain intact deposits and cultural resources was not visible during the field survey. A field survey of the project area did not identify any cultural resources or midden soils; however a biface fragment (e.g. shaped stone) was observed outside of the project area above the road cut south of the Anderson Dam boat launch adjacent to Cochrane Road and the northeastern portion of the project area.

Paleontological Resources

The UCMP database was searched for fossil locations in Santa Clara County. The results of the UCMP record search identified numerous vertebrate fossil sites in Tertiary to Quaternary age deposits in Santa Clara County. Many of these sites are located at distances of greater than twenty miles from the project area; however, fossils of comparable age have also been recovered from the Santa Clara Formation, which is located approximately 3.5 miles north of the project area in the vicinity of Anderson Dam. According to the geotechnical investigation, the project area is primarily underlain by alluvial gravel, sand, and clays of valleys (Qa) (Holocene) with a very small portion in the northeastern portion of the project area that is comprised of gravel/conglomerate of the Santa Clara Formation (QTs).

Regulatory Framework

CEQA Guidelines. Section 15064.5(a) of the CEQA Guidelines defines an "historical resource" to include (1) a resource listed in, or determined to be eligible for listing in the California Register of Historical Resources (CRHR); (2) a resource included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1(g); and (3) any building, structure, object, site, place, record, or manuscript which a lead agency determines to be historically significant.

Section 15064.5(a)(3) of the CEQA Guidelines states that a resource shall be considered historically significant by a lead agency if it meets criteria for listing on the CRHR (PRC Section 5024.1; Title 14 of the California Code of Regulations [CCR], Section 4852).

The CRHR sets forth four criteria for evaluating the eligibility of a cultural property. These criteria closely parallel the National Register of Historic Places (NRHP) with an emphasis on California's past. The property must satisfy one or more of the following:

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

2. It is associated with the lives of persons important in our past;

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

4. It has yielded, or may be likely to yield, information important in prehistory or history.

CEQA Section 15064.5(b) provides that a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. A "substantial adverse change in the significance of an historical resource" is defined as physical demolition, destruction, relocation or alteration of a resource or its immediate surroundings that would materially impair significance of an historical resource. Section 15126.4(b)(3) of the CEQA Guidelines requires public agencies, where feasible, to avoid damaging effects on any historical resource of an archaeological nature. Preservation in place is the preferred manner of mitigation impacts to archaeological sites. Preservation in place may be accomplished by avoiding a resource, incorporating sites within open space, covering sites with fill, or deeding sites into a permanent easement (14 CCR 15126.4(b)(3)). 14 CCR 15126.4(b)(1) provides that where maintenance, repair, restoration, preservation, conservation or reconstruction of a historical resource is conducted in a manner consistent with the Secretary of Interior's Standards for the Treatment of Historical Properties, the project's impact on the historical resource shall generally be considered mitigated below a level of significance.

California Health and Safety Code. According to Section 7050.5 of the Health and Safety Code, in the event human remains are discovered during excavation, work must stop immediately and the county coroner must be contacted. If the remains are determined by the coroner to be Native American in origin, the coroner is responsible for contacting the NAHC within 24 hours. Sections 5097.94 and 5097.98 of the California PRC require consultation with the NAHC, protection of Native American remains, and notification of most likely descendants.

Senate Bill (SB) 447 (Chapter 404, Statutes of 1987) also protects Native American remains or associated grave goods.

***Paleontological Resources*.** State requirements for paleontological resource management are in Public Resources Code (PRC) Chapter 1.7, Section 5097.5/5097.9 (Stats. 1965, c. 1136, p. 2792), entitled Archaeological, Paleontological, and Historical Sites. This statute defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources.

DISCUSSION

a) ***Potentially Significant Unless Mitigation Incorporated.*** The proposed project would primarily replace existing pipelines within the existing alignment, except for the area along Half Road. The proposed demolition and reconstruction of the chemical feed station would occur on fallow agricultural land.

The proposed project would comply with standard precautionary measures for accidental discovery of unknown finds consistent with BMP CR-1 (Accidental Discovery of Archaeological Artifacts or Burial Remains), as included in the project description in Section 3 (Table 3). However, based on the proximity of the project area to four previously recorded archaeological sites, the environmental setting, archaeological sensitivity, and historic-period development, the northeastern portion of the project area along Cochrane Road is considered sensitive for the presence of subsurface archaeological resources as the proposed project would entail sub-surface ground disturbance in areas without previous disturbance (e.g. trenches would be wider and deeper). Even with implementation of the BMP, the potential disturbance or damage of previously unidentified archaeological deposits within the project area would be considered a **potentially significant impact**.

The proposed project would comply with Mitigation Measure CR-2 (see text below), which would require that a qualified professional archaeologist monitor ground disturbing activities in the northeastern portion of the project area and follow appropriate procedures should any sites be found during monitoring. Implementation of this mitigation measure would reduce this impact to a **less than significant level**.

b) ***Potentially Significant Unless Mitigation Incorporated.*** While vertebrate remains are comparatively rare in the fossil record, based on the review of geologic maps and reports, as well as the review of the UCMP records for Santa Clara County, there is the potential that vertebrate fossils could accidentally be encountered during construction activities in any material associated with the Santa Clara Formation. However, the northeastern portion of the project area near Anderson Dam that overlies the Santa Clara Formation includes removal and installation of an existing pipeline within Cochrane Road. Although the project area was previously disturbed with installation of the pipeline and construction of the road, the proposed project would entail sub-surface ground disturbance in areas without previous disturbance. Therefore, in the unlikely event that a unique paleontological resource or site is encountered during construction activities, exposure of the resource could lead to its destruction, which would constitute a significant impact. Implementation of Mitigation Measure CR-2 (see text below) would avoid or minimize any potential loss of paleontological resources by requiring that the District retain a qualified paleontologist to determine significance if a discovery is encountered during construction

activities and by taking appropriate actions to protect the resource. With implementation of this mitigation measure, the proposed project would result in a **less than significant impact** to paleontological resources.

c) ***Less than Significant Impact.*** Human remains could potentially be discovered during construction activities. Construction activities must comply with standard precautionary measures for the accidental discovery of unknown finds consistent with the District's BMP CU-1 (Accidental Discovery of Archaeological Artifacts or Burial Remains) as included in the project description in Section 3 (Table 3). Impacts resulting from disturbance of human remains would therefore be considered a **less than significant impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

CR-1: Accidental Discovery of Archaeological Artifacts or Burial Remains

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

MM-CR-1: ***Conduct Archaeological Monitoring and Preparation of a Data Recovery Plan if Avoidance is Not Feasible***. A qualified professional archaeologist shall monitor ground disturbing activities during construction activities within the archaeologically sensitive area along Cochrane Road between Coyote Road and Barnard Road in the northeastern portion of the project area. The monitoring shall continue until ground disturbing activities are complete or until the monitoring archaeologist is satisfied that there is no likelihood of encountering intact archaeological deposits based observations in the field.

If archaeological resources are identified in the project area during construction activities, the archaeological monitor shall examine the area closely and temporarily maker the extent of the cultural deposit. Archaeological sites that appear intact and are potentially significant shall be recorded on the California Department of Parks and Recreation 523 Forms and photographed.

If the evaluation determines that the deposit is neither a historical nor a unique archaeological resource, avoidance of the deposit is not necessary. If an archaeological resource is determined to be a historical resource or unique archaeological resource, the following shall be implemented: a data recovery plan shall be developed in consultation with descendent community representatives: resource shall be recorded; a report of findings shall be prepared; and the recovered archaeological materials shall be preserved at an appropriate curation facility (e.g. Sonoma State University Curation Facility). Upon completion of the evaluation, the archaeologist shall prepare a report to document the methods and results of the investigation that shall be submitted to the District, the descendent community involved in the investigation, and the Northwest Information Center.

MM CR-2: ***Preservation of Paleontological Resources If Discovered During Construction***. If any potentially unique paleontological resources (fossils) are encountered during construction activities, work shall be halted immediately within 50 feet of the discovery. The District shall be notified immediately, and a qualified paleontologist shall be retained to determine the significance of the discovery. Based on the significance of the discovery, the qualified paleontologist

shall present options to the District for protecting the resources. Appropriate action may include avoidance, preservation in place, excavation, documentation, and/or data recovery, and shall always include preparation of a written report documenting the find and describing steps taken to evaluate and protect significant resources. The District will implement feasible and appropriate recommendations and mitigation measures of the qualified paleontologist for any unanticipated discoveries. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery or other appropriate measures.

6. GEOLOGY AND SOILS

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death related to: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?				✓
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 waste water disposal systems where sewers are not available for the disposal of waste water?				✓

ENVIRONMENTAL SETTING

This section is based on the following:

- *Geotechnical Investigation Report:* Review of a geotechnical investigation, which was prepared for the proposed project by Parikh in May 2016. The geotechnical investigation included a total of 14 borings and laboratory testing of the soil samples.

- *Santa Clara County Soil Survey*: Review of the soil survey for Santa Clara County Area (Natural Resources Conservation Service 2016).

Geologic Setting

The project area is located in the San Francisco Bay area, which is one of the most seismically active areas in North America and is dominated by the San Andreas Fault system. This fault system movement is distributed across a complex system of generally strike-slip right-lateral parallel and sub-parallel faults including San Andreas, San Gregorio, Hayward and Calaveras. A major earthquake at any of these sites could produce a strong ground shaking in the study area.

The project area is located in the Coast Range geomorphic province of California. The Coast Range forms a nearly continuous topographic barrier between the California coastline and the San Joaquin Valley. The Coast Range in this region is a double chain of mountains running north-northwest. Three prominent geologic blocks dominate the San Francisco Bay Area: the Santa Cruz Mountains (western block), the San Francisco Bay (central block), and the East Bay Hills/Diablo range (eastern block). The project area is underlain by alluvial gravel, sand and clay of valleys (Qa) (Holocene).

Soils

According to the Natural Resources Conservation Service (NRCS), ten soil mapping units are found within the project area as shown in Table 4-5: Soils within the Project Area. The majority of the project area is dominated by Pleasanton loam, 0 to 2 percent slopes, which is a sandy loam soil complex.

Table 4-5: Soils Within the Project Area

Soil Series	Soil Name
ArA	Arbuckle gravelly loam, 0 to 2 percent slopes
GaA	Garreston loam, gravel substratrum, 0 to 2 percent slopes
GbB	Garreston gravelly loam, 30 to 50 percent slopes
GoF	Gilroy clay loam,30 to 50 percent slopes
KeC2	Keefers clay loam, 2 to 9 percent slopes
LrC	Los Robles clay loam, 2 to 9 percent slopes
McB	Maxwell clay, 0 to 5 percent slopes
PoA	Pleasanton loam, 0 to 2 percent slopes
PpA	Pleasanton gravelly loam, 0 to 2 percent slopes
SdA	San Ysidro loam, 0 to 2 percent slopes

Source: NRCS 2016

Based on the available boring information from the geotechnical investigation, the subsurface soil conditions within the project area consist of mainly stiff to very stiff clay with gravel, underlain by medium dense to very dense silty/clayey sand with gravel and/or very stiff to hard lean clay.

Alquist-Priolo Earthquake Fault Zone

Based on the State of California "Special Studies Zones Morgan Hill & Mount Sizer Quadrant", the project area is located approximately over a mile from the Alquist-Priolo Earthquake Fault Zone.

Seismic Ground Shaking

Many faults in the project vicinity can cause strong ground shaking at the project site. Maximum moment magnitudes (M_{max}) of some of the closest faults in the area are shown in Table 4-6: Faults in the Project Vicinity. These maximum moment magnitudes represent the largest earthquake a fault is capable of generating and is related to the seismic moment.

Table 4-6: Faults in the Project Vicinity

Fault	Maximum Moment Magnitude of Fault, M_{max}	Fault Type	Site to Fault Distance (miles)
Silver Creek	6.9	Reverse	1.5
Calaveras (Central)	6.9	Strike Slip	2.3
Hayward (Southern extension)	6.7	Strike Slip	7.3
Cascade Fault	6.7	Reverse	8
Sargent Fault	7.0	Strike Slip	9
San Andreas	8.0	Strike Slip	11.5

Source: Parikh 2016

Seismic hazards may arise from three sources within the project area: surface fault rupture, ground shaking, and liquefaction. The potential for the project area to experience strong ground shaking is considered high. A peak ground acceleration of 0.72g was calculated in the geotechnical investigation prepared for the proposed project.

Liquefaction

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary, but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Saturated cohesionless sands and silts of low relative density are the type of soils that are usually susceptible to liquefaction. Clays are generally not susceptible to liquefaction and gravels tend to drain well and are not usually susceptible to liquefaction either.

The geotechnical investigation evaluated the liquefaction potential using the data from the borings and an estimate of peak ground acceleration. This method compares the estimates of the earthquake-induced shear stress to the susceptibility of soil liquefaction. According to the geotechnical investigation, the liquefaction potential of subsurface soil from the borings along the alignment of the proposed project is considered low.

Lateral Spreading

Liquefaction-induced lateral spreading has been defined as the "lateral displacement of large surficial blocks of soil as a result of liquefaction in a subsurface layer." Lateral spreading refers to more moderate movements of gently sloping ground due to soil liquefaction. Liquefaction-induced lateral spreading occurs on mild slopes of 0.3 to 5 percent underlain by loose sand and shallow water. The geologic conditions conducive to lateral spreading are frequently found along streams and other waterfronts in recent alluvial or deltaic deposits, as well as in loosely-packed, saturated, sandy fills. According to the geotechnical investigation prepared for the proposed project, lateral spreading is unlikely to occur within the project area because there is no open face (water course, cliff, bank, ditch, etc.) in the vicinity of the pipelines (Parikh 2016).

DISCUSSION

ai) ***No Impact.*** Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active or potentially active major fault trace. The proposed project consists primarily of the replacement of existing pipelines along existing paved roadways that would be designed in accordance with the geotechnical investigation prepared for the proposed project. The project area is located more than a mile northeast from the Alquist-Priolo Earthquake Fault Zone. Therefore, the proposed project is not anticipated to expose people (e.g. construction workers or nearby residents) or structures to injury or loss from rupture of a known earthquake fault as no active faults pass through the project area, the potential for fault rupture is considered low, and the project would be designed in accordance with the recommendations in the geotechnical investigation to resist seismic forces. In addition, the proposed project does not include the construction of buildings which would result in people residing or working in the project area once constructed. Therefore, this would be considered **no impact**.

aii) ***Less than Significant Impact.*** The major faults in the region that could cause ground shaking within the project area include the Silver Creek fault and the Calaveras fault, which are located 1.5 miles and 2.3 miles from the project area, respectively. Although, seismic shaking may occur within the project area, the proposed project would be designed in accordance with the geotechnical investigation prepared for the proposed project to resist seismic forces. Conformance with the recommendations in the geotechnical investigation would minimize the potential effects of strong ground shaking to the proposed project, which would ensure that nearby residents in the project area are not injured by the pipeline during an earthquake. In addition, workers within the project area during construction activities are not anticipated to be affected by strong ground shaking based on the distance to the nearest faults. Therefore, this is considered a **less than significant impact.**

aiii) ***Less than Significant Impact***. According to the geotechnical investigation prepared for the proposed project, the potential for liquefaction triggering and related hazards, including liquefaction and liquefaction-induced settlement was is low. Therefore, impacts associated with seismic-related ground failure would be considered **less than significant**.

aiv) ***No Impact.*** The topography of the project area and surrounding area is level and is not located within a landslide hazard zone. Therefore, the proposed project would result in **no impact** from landslides.

b) ***Less than Significant Impact.*** Construction of the proposed project including grading, trenching and backfilling could destabilize the soil and increase the erosion potential from water and wind. As described in Section 3, the proposed project would implement District Hydrology and Water Quality BMPs including: WQ-2 (Limit impacts of from Staging and Stockpiling of Materials) and WQ-3 (Stabilize construction and entrances and exits), which requires implementation of measures to minimize soil from being tracked near work sites; WQ-5 (Maintain clean conditions at work sites), which requires that the work sites and access roads are maintained in an orderly condition; WQ-6 (Prevent water pollution), which requires oily, greasy, or sediment laden substances or other material that originates from project operations to not be allowed to enter or be placed where it may enter a waterway; and WQ-7 (Prevent Stormwater Pollution), which requires that measures be implemented to prevent stormwater pollution. Therefore, the proposed project would have a **less than significant impact** on water quality.

c) ***No Impact.*** According to the geotechnical investigation prepared for the proposed project, the project area is not located on a soil that is considered unstable or would become unstable with implementation of the proposed project. Therefore, the project would result in **no impact**.

d) ***Less than Significant Impact.*** Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. Expansive soils are common throughout California and can cause damage unless properly treated during construction. Based on the available boring information from the geotechnical investigation, the subsurface soil conditions within the project area consist of mainly stiff to very stiff clay with gravel, underlain by medium dense to very dense silty/clayey sand with gravel and/or very stiff to hard lean clay. The presence of expansive soils in the project area has been incorporated into the project design. Standard construction methods for pipelines would be employed including appropriate selection of backfill materials that do not exhibit expansive behavior. Therefore, impacts associated with expansive soils would be **less than significant**.

e) ***No Impact.*** The proposed project does not include the installation of septic tanks or alternative wastewater disposal systems. During construction activities, the proposed project would be required to comply with District BMP WQ-8 (Manage Sanitary and Septic Waste), which would require that temporary sanitary facilities are located within a project area and that they are not located where overflow or spillage will not enter a watercourse directly (overbank) or indirectly (through a storm drain). Therefore, the proposed project would not result in soils incapable of adequately supporting the use of septic tanks or other waste water disposal systems and would have **no impact** on the proposed project.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

WQ-2: Limit Impacts from Staging and Stockpiling of Materials
WQ-3: Stabilizes Construction and Entrances and Exits
WQ-5: Maintain Clean Conditions at Work Sites
WQ-6: Prevent Water Pollution
WQ-7: Prevent Stormwater Pollution
WQ-8: Manage Sanitary and Septic Waste

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

7. GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purposed of reducing the emissions of greenhouse gases?			✓	

An air quality and greenhouse gas analysis report was prepared by LSA in September 2016 to evaluate whether the proposed project would cause significant air quality or greenhouse gas impacts. The air quality and greenhouse gas analysis report is incorporated herein and included as Appendix A.

ENVIRONMENTAL SETTING

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2 degrees Celsius (°C) or 1.1 ± 0.4° Fahrenheit (°F) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other greenhouse gases (GHGs) are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are the following:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)

- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e). For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

Regulatory Framework

***Assembly Bill 32*.** The California State Legislature adopted AB 32 in 2006. AB 32 focuses on reducing GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) to 1990 levels by the year 2020. Pursuant to the requirements in AB 32, the ARB adopted the Climate Change Scoping Plan (Scoping Plan) in 2008, which outlines actions recommended to obtain that goal. The Scoping Plan calls for an "ambitious but achievable" reduction in California's GHG emissions, cutting approximately 30 percent from business as usual emission levels projected for 2020, or about 10 percent from today's levels. On a per-capita basis, that means reducing annual emissions of 14 tons of carbon dioxide for every man, woman, and child in California down to about 10 tons per person by 2020. In October 2010, ARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 million $MTCO_{2eq}$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels.

***Bay Area Air Quality Management District*.** The BAAQMD does not have thresholds for construction related GHG emissions. However, the BAAQMD has stationary and operational-related thresholds for the emission of GHG shown in Table 4-7: BAAQMD Greenhouse Gas Thresholds of Significance.

Table 4-7: BAAQMD Greenhouse Gas Thresholds of Significance

Project Type	Construction-Related	Operational-Related
Projects other than Stationary Sources1	None	Compliance with Qualified Climate Action Plan OR 1,100 $MTCO_2eq/yr.$ OR 4.6 $MTCO_2eq/SP2/yr.$
Stationary Sources[1]	None	10,000 $MTCO_2eq/yr.$
$MTCO_2eq/yr.$ = metric tons of carbon dioxide equivalent per year		

Notes:
1: According to the BAAQMD CEQA Guidelines, a stationary source project is one that includes land uses that would accommodate processes and equipment that emits GHG emissions and would require a BAAQMD permit to operate. Projects other than stationary sources are land use development projects including residential, commercial, industrial, and public uses that do not require a BAAQMD permit to operate.
2: SP = service population (residents + employees)

Source: BAAQMD, Options and Justification Report, October 2009 and BAAQMD, CEQA Air Quality Guidelines, May 2011.

DISCUSSION

a) ***Less than Significant.*** Construction activities would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and vendor vehicles, each of which typically use fossil-based fuels to operate. The combination of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction levels change.

The BAAQMD does not have adopted thresholds of significance for construction related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Based on modeling conducted for the proposed project, the GHG emissions would be approximately 1,021 metric tons of CO_2 during the 17 month construction period. The proposed project would not generate additional operational emissions as maintenance activities would be similar to existing conditions. Implementation of the District BMP AQ-1 (Dust Control Measures) would further reduce GHG emissions during construction activities. Therefore, the proposed project would result in a **less than significant impact** to GHGs.

b) ***Less than Significant Impact.*** The project's consistency with the *County of Santa Clara Climate Action Plan*, the *City of Morgan Hill General Plan*, and the *AB 32 Scoping Plan* is assessed below:

County of Santa Clara Climate Action Plan and Policies in the City of Morgan Hill General Plan - The City of Morgan Hill General Plan primarily addresses development projects or specific actions the City will take to reduce GHG emissions. The County of Santa Clara Climate Action Plan for Operations and Facilities focuses on County operations, facilities and employee actions that will reduce GHG emissions, energy,

water consumption, solid waste, and fuel consumption. The proposed project would restore/replace pipelines and none of the strategies in the County's Climate Action Plan or the City of Morgan Hill General Plan are applicable to the proposed project.

AB 32 Scoping Plan - The proposed project is compared with the AB 32 Scoping Plan (scoping plan) in order to determine compliance with any applicable plan, policy, or regulation adopted to reduce emissions of GHGs. The scoping plan contains a variety of strategies to reduce the State's emissions. The strategies in AB 32 are not applicable to the proposed project as the project includes restoration of an existing pipeline and would not result in additional operational emissions. Since no strategies are applicable to the project, the proposed project would not conflict with the AB 32 scoping plan.

Therefore, the proposed project would not conflict with the City of Morgan Hill General Plan, County of Santa Clara Climate Action Plan or the AB 32 Scoping Plan, which would be considered a **less than significant impact.**

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

AQ-1: Dust Control Measures

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

8. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, storage or disposal of hazardous materials?			✓	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?			✓	
d) Be located on a site which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5, and as a result, would it create a significant hazard to the public or the environment?			✓	

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 in or working in the project area?				✓
f) For a project within two miles of an airport or in the vicinity of a private airstrip, would the project result in a substantial safety hazard for people residing or working in the project area or to aircraft utilizing the airport?				✓
g) Impair implementation of an adopted emergency response 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?			✓	

ENVIRONMENTAL SETTING

The project area is rural in nature and is comprised of primarily rural residential and agricultural uses (e.g., fruit orchards). The proposed project would be primarily located within the existing roadways of Cochrane Road, Half Road, and East Main Avenue.

Hazardous Materials

The project area is not on a state-listed hazardous materials clean-up site. According to the California State Water Resources Control Board (SWRCB) Geotracker website (SWRCB 2016), there are several agricultural properties along Half Road and between Half Road and East Main Avenue that are currently enrolled in the irrigated land regulatory program.

According to the Department of Toxic Substances Control (DTSC) EnviroStor database, the Borello property located on Peet Road, East of Mission Avenida in Morgan Hill, CA, approximately 2,600 feet from the project area, which is an active school clean-up site (DTSC 2016). The property was operating as an apple orchard until the property was designated for construction of a new elementary school by the Morgan Hill Unified School District. The property is scheduled to be remediated over a period of 45 days in the summer of 2017 (Personal Communication with Casino Fajardo, Director of Construction and Modernization, Morgan Hill Unified School District, September 13, 2016).

Fire Hazard Severity Zone

Per the California Department of Forestry and Fire Protection maps of Very High Fire Hazard Severity Zones for Santa Clara County, the project area is located within the Local Responsibility Area and is not considered a very high fire hazard severity zone (Cal FIRE 2016).

Sensitive Receptors

Sensitive receptors located in the project vicinity include low density rural residential uses located along East Main Avenue, Cochrane Road, and Half Road within the project area that are located approximately 40 feet from the construction area, as well as buildings/classrooms associated with Live Oak High School, which are located along Half Road approximately 1,000 feet from the project area.

Emergency Evacuation Routes

Per the *County of Santa Clara Emergency Operations Plan*, there are no designated emergency evacuation routes within the project area.

Airport

The nearest airport to the project area is the San Martin Airport, which is located approximately six miles southwest of the project area.

DISCUSSION

a) ***Less than Significant Impact.*** The proposed project would replace existing underground pipelines, related vault structures, and demolish and reconstruct an existing chemical feed station. After construction of the proposed project, no additional transport or disposal of hazardous materials would be associated with the proposed project. While gas and diesel fuel would typically be used by construction vehicles, the District will implement the following BMPs: BMPs HM-1 (Restrict Vehicle and Equipment Cleaning to Appropriate Locations) and HM-2 (Ensure Proper Vehicle and Equipment Fueling and Maintenance), which would require that vehicles and equipment are washed only at approved areas and that no fueling or servicing of vehicles is done in a waterway or immediate floodplain; BMP HM-3 (Ensure Proper Hazardous Materials Maintenance), which includes measures to ensure that hazardous materials are properly handled and the quality of water resources is protected; and BMP HM-4 (Utilize Spill Prevention Measures), which includes measures to prevent the accidental release of chemicals, lubricants, and non-storm drainage water measures as noted in the Project Description in Section 3 (Table 3) to minimize the potential of construction-related fuel hazards. In addition, use, storage, transport and disposal of hazardous materials (including any hazardous wastes) during construction activities would be performed in accordance with existing local, state, and federal hazardous materials regulations. Therefore, implementation of the proposed project would not create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials. Therefore, this is considered a **less than significant impact.**

b) ***Less Than Significant Impact.*** As described in Response (a) above, project operations would not require routine use of hazardous materials; therefore, no hazards or hazardous materials impacts related to long-term operation of the proposed project are

anticipated. Construction activities would include the use of limited quantities of ordinary equipment fuels and fluids. However, these materials would not be used in sufficient quantities to pose a substantial threat to human or environmental health. Such materials would be kept at construction staging areas, and would be secured when not in use. As described in Response a) above, in order to avoid or minimize potential of accidental release of hazardous materials, the District will implement BMPs HM-1 (Restrict Vehicle and Equipment Cleaning to Appropriate Locations), HM-2 (Ensure Proper Vehicle and Equipment Fueling and Maintenance, HM-3 (Ensure Proper Hazardous Materials Maintenance), HM-4 (Utilize Spill Prevention Measures) as noted in the Project Description in Section 3. In the unlikely event of a spill, fuels would be controlled and disposed of in accordance with applicable regulations. Therefore, the proposed project would not create a significant hazard to the public or environment. This impact is considered **less than significant.**

c) ***Less Than Significant Impact.*** Buildings/classrooms at Live Oak High School are located along Half Avenue approximately 1,000 feet south of the project area. As described in Response a) and b) above, operation of the proposed project would not require the routine use, transport or disposal of hazardous materials. During construction activities, gas and diesel fuel would typically be used by construction vehicles. With implementation of District BMPs HM-1 (Restrict Vehicle and Equipment Cleaning to Appropriate Locations), HM-2 (Ensure Proper Vehicle and Equipment Fueling and Maintenance, HM-3 (Ensure Proper Hazardous Materials Maintenance), HM-4 (Utilize Spill Prevention Measures) as noted in the Project Description in Section 3 and described above, the potential for the release of hazardous material from accidental spills and/or leaks during construction would be minimized. Therefore, this impact would be considered **less than significant**.

d) ***Less than Significant.*** Per the DTSC EnviroStor database, there is a former agricultural property located approximately 2,600 feet from the project area that is undergoing clean-up by the Morgan Hill Unified School District to meet the Department of Education standards for construction of a new elementary school. There are no sites, including sites compiled pursuant to Government Code section 65962.5, in the project vicinity. Therefore, implementation of the proposed project is not anticipated to result in impacts from hazardous materials, which would be considered a **less than significant impact**.

e, f) ***No Impact.*** The San Martin Airport (formerly the South County Airport) is located approximately six miles southwest of the project area. According to the *Comprehensive Land Use Plan for the South County Airport* (County of Santa Clara 2008), the project area is outside of the airport land use plan and would not result in a safety hazard to people working within the project area. The project area is not located in the vicinity of a private airstrip. Therefore, the proposed project would not result in a substantial safety hazard for people residing or working in the project area, which would result in **no impact.**

g) ***Less than Significant Impact***. According to the *County of Santa Clara Emergency Operations Plan*, there are no designated emergency evacuation routes within the project area. The proposed project would result in vehicle commute traffic; haul trips for the import and export of fill from the project area; and the movement of construction equipment from the staging areas to active construction areas. As described in Subsection 16: Transportation/Traffic and in the Traffic Impact Analysis (Appendix D), the proposed project would not result in substantial traffic delays, as traffic flow would be

maintained even if temporary lane closures are required for some activities. The District would coordinate with surrounding uses (e.g. Live Oak High School and residential uses) to ensure that access for emergency vehicles is maintained at all times during construction activities. Therefore, implementation of the proposed project is not anticipated to impede emergency access to the project area and/or surrounding area, which would be considered a **less than significant impact**.

h) ***Less than Significant Impact***. The project area is dominated by agricultural and rural residential uses. Per the California Department of Forestry and Fire Protection maps of Very High Fire Hazard Severity Zones for Santa Clara County, the project area is located within the Local Responsibility Area and is not considered a very high fire hazard severity zone (Cal FIRE 2016). However, the proposed project would implement District BMP HM-5 (Incorporate Fire Prevention Measures) as noted in the Project Description in Section 3, which requires that equipment be equipped with spark arrestors, fire suppression equipment is available to the workers, and that smoking is prohibited in order to prevent surrounding vegetation from igniting during construction activities. Therefore, the proposed project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, which would be considered a **less than significant impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

HM-1: Restrict Vehicle and Equipment Cleaning to Appropriate Locations
HM-2: Ensure Proper Vehicle and Equipment Fueling and Maintenance
HM-3: Ensure Proper Hazardous Materials Maintenance
HM-4: Utilize Spill Prevention Measures
HM-5: Incorporate Fire Prevention Measures

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

9. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?		✓		
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 ground water table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses of 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 a stream or river, in a manner which would result in substantial erosion or siltation on- or off-effect?			✓	

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially alter existing drainage patterns of the site or area, including through the alteration 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 that 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 Map or other flood hazard delineation map which would impede or redirect flood flows?			✓	
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			✓	
i) Expose people or structures to significant risk of loss, injury, or death involving flooding, including flooding as a result of failure of a levee or dam?			✓	
j) Inundation by seiche, tsunami, or mudflow?				✓

ENVIRONMENTAL SETTING

Groundwater Basin

The project area is located in the Llagas Creek watershed and Llagas Creek groundwater basin (basin) as shown in Figure 3: Llagas Groundwater Recharge Area. The surface area of the Llagas groundwater Subbasin is 56,000 acres. Recharge of the Llagas groundwater Subbasin is achieved through an equal combination of natural recharge and recharge activities of the District (23,000 afy each). Although infiltration varies across the basin, this creates an average annual infiltration volume of 0.4 acre-feet per acre of surface area.

During development of the District's *Integrated Water Resources Planning Study*, it was determined that there would be frequent water supply shortages within 25 years in South County. A later study conducted by the District in collaboration with the cities of Morgan Hill and Gilroy and the County of Santa Clara estimated water supply shortages ranging from 4,000 ~~acre feet per year~~ AFY to 16,000 AFY by the year 2030. These shortfalls were determined to be more pronounced in the Morgan Hill area due to limited groundwater sub-basin inflows.

Flooding

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, the project area is not located within the 100-year floodplain (i.e., an area in which there is a one

percent chance per annum of a one hundred-year storm event) (FEMA 2009). However, the project area is located in the dam inundation area for the Anderson Dam (Santa Clara Valley Water District 2009).

Regulatory Framework

Water quality is regulated under the federal Clean Water Act (CWA) and California Porter-Cologne Water Quality Control Act. The project area is located in the Central Coast Region of the Regional Water Quality Control Board and is subject to the Water Quality Control Plan for the Central Coastal Basin.

The Porter Cologne Act, which is codified in the State Water Code, establishes the responsibilities and authorities of the nine Regional Water Quality Control Boards and the State Water Resources Control Board (SWRCB) whose primary responsibility is for the coordination and control of water quality. Each Regional Board is directed to prepare a water quality control plan (aka "Basin Plan") that includes the following components: beneficial uses which are to be protected, water quality objectives which protect those uses, and an implementation plan which accomplishes those objectives. The federal Clean Water Act (Public Law 92-500, as amended) provides for the delegation of certain responsibilities in water quality control and water quality planning to the states. Where the Environmental Protection Agency (EPA) and the ~~State Water Resources Control Board (~~SWRCB~~)~~ have agreed to such delegation, the Regional Boards implement portions of the Clean Water Act, such as the National Pollution Discharge Elimination System (NPDES) program.

***National Pollution Discharge Elimination System*.** The NPDES controls the discharge of pollutants to water bodies from point and non-point sources. In the Bay Area, the program is administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB), which was expanded in 1990 to include permitting of stormwater discharges from construction sites that disturb more than one acre. Because the proposed project would disturb more than one acre of land during construction activities, the District will need to comply with the requirements of the NPDES General Permit for construction activities.

The general permit for construction activities requires an applicant file a public notice of intent (NOI) with the applicable RWQCB and prepare and implement a storm water pollution and prevention plan (SWPPP). The SWPPP would include a site map, description of stormwater discharge activities, and best management practices that would be employed to prevent water pollution. The SWPPP Best Management Practices (BMPs) would be used to control soil erosion and discharges of other construction-related pollutants that could contaminate nearby water resources.

DISCUSSION

a, f) ***Potentially Significant Unless Mitigation Incorporated.*** Activities required to construct the project, including site clearing, excavation, grading, pipeline dewatering, fill placement and stockpiling, have the potential to expose soils and mobilize sediments in stormwater. Additionally, hazardous materials such as fuels, oils, grease, and lubricants from construction equipment could be accidentally released during construction. Accidental discharge of these materials could adversely affect water quality and/or result in violation of water quality standards. Such water quality effects could spread downstream from the Madrone Channel, which is occasionally allowed to discharge into East Little Llagas creek, potentially resulting in the degradation of water quality.

The proposed project includes the following District BMPs: HM-1 (Restrict Vehicle and Equipment Cleaning to Appropriate Locations) and HM-2 (Ensure Proper Vehicle and Equipment Fueling and Maintenance), which requires that vehicles and equipment are washed only in approved areas and that no fueling or servicing of vehicles occurs in a waterway or immediate floodplain; and HM-3 (Ensure Proper Hazardous Materials Management) and HM-4 (Utilize Spill Prevention Measures), which includes measures that ensure that hazardous materials are properly handled and the quality of water resources is protected and that spill prevention measures are incorporated to prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water. The proposed project also incorporates the following water quality BMPs including: WQ-1 (Conduct Work from Top of Bank), which requires that work activities be conducted from top of bank if there are flows in the channel; WQ-2 (Limit Impacts from Staging and Stockpiling Materials), which requires implementation of measures to minimize soil from being tracked onto streets near work sites; WQ-3 (Stabilize Construction Entrances and Exits), which requires measures are implemented to minimize soil from being tracked into streets near work sites; WQ-4 (Use Seeding for Erosion Control, Weed Suppression, and Site Improvement), which requires disturbed areas are seeded with native seed as soon as it is appropriate after activities are complete; WQ-5 (Maintain Clean Conditions at Work Sites), which requires that the work sites and access roads are maintained in an orderly condition; WQ-6 (Prevent Water Pollution), which requires oily, greasy, or sediment laden substances or other material that originates from project operations not be allowed to enter or be placed where it may enter a waterway; WQ-7 (Prevent Stormwater Pollution), which requires that measures be implemented to prevent stormwater pollution; and WQ-8 (Manage Sanitary and Septic Waste), which requires that temporary facilities are located on the job site to manage sanitary and septic waste. Implementation of these measures would minimize impacts on water quality.

In addition, the proposed project would be required to comply with all applicable VHP conditions, including Conditions 3: Maintain Hydrologic Conditions and Protect Water Quality and Condition 12: Wetland and Pond Avoidance. Condition 3 requires implementation of design phase, construction phase, and post-construction phase measures, including programmatic BMPs, performance standards, and control measures, to minimize increases of peak discharge of storm drain water and to reduce runoff of pollutants to protect water quality, including during construction. VHP Condition 12 requires the implementation of design phase and construction phase measures to avoid and minimize impacts on wetlands and ponds, including erosion control measures, fencing of avoided wetlands during construction, establishment of buffers between wetlands and refueling areas, and measures to minimize the spread of invasive species.

If dewatering is necessary in the pipeline or in areas where groundwater is encountered within the planned depth of excavation for pipeline installation, the water would be pumped to adjacent agricultural fields (depending on agreements with adjacent landowners), the Madrone Channel, the Main Avenue Percolation Ponds or the existing storm water drainage facilities based on the proximity of the work in progress. The water in the pipeline is untreated/raw water. As the pipelines convey raw water, dewatering would be covered under the General Permit as an authorized non-stormwater discharge. Such dewatering operations would be evaluated included in the SWPPP. The turbidity would be monitored and appropriate methods to remove turbidity, would be incorporated as needed, to minimize the increase in turbidity levels consistent with District requirements (as defined in BMP WQ-6, see Table 3). However, pipeline dewatering could create erosion, and increase sediment within receiving waters, which would be considered a **potentially significant impact**. Mitigation Measures WQ-1 through WQ-3 (see text below) would reduce this impact to a less than significant level by requiring that the District gradually increase discharge rates, implement erosion control measures

during dewatering, and monitor discharge locations for erosion if dewatering of the pipelines is required.

After construction is complete, the pipelines would be operated similar to existing conditions and in compliance with federal, state, and local regulations. Project operation would not contribute pollutants identified as impairing water quality into the storm drain system or downstream waters. Operation of the pro posed project is anticipated to have a **less than significant impact** on water quality because there would be no change in operation from what occurs under existing conditions.

b) ***Less than Significant Impact.*** Construction of the proposed project would be phased to minimize the effects to the groundwater recharge operations within the project area. As described in the project description, the current plan is to install the new pipelines in three phases to keep either the Main Avenue or Madrone Channel recharge facilities fully operational during each phase of the proposed project. During construction of Segment 1, both the Main Avenue Ponds and the Madrone Channel recharge facilities will be operational; during construction of Segment 2, the Main Avenue Percolation Ponds will be operational as well as the lower ponds of the Madrone Channel recharge facility (ponds #7-10).; and during construction of Segment 3, the Madrone Channel recharge facility will be operational.

The upper Llagas Subbasin is hydraulically connected to the rest of the Llagas Subbasin that supplies water to the City of Gilroy, San Martin, and other unincorporated areas. Other District managed recharge facilities in the Llagas Subbasin will remain operational throughout the proposed construction period. The San Pedro Recharge Ponds, located in San Martin, can receive imported water via the Santa Clara Conduit and have a recharge capacity of about 4,700 AFY. The Church Avenue Recharge Ponds, located on Llagas Creek, can receive local water diverted off-stream and have a recharge capacity of about 7,300 AFY. Groundwater storage in the region also benefits from managed recharge that occurs instream in local creeks (an estimated additional 15,000 acre-feet per year). The Llagas Subbasin also receives natural recharge from precipitation and overland runoff, septic system and irrigation return flows, mountain-front recharge and inflow from adjacent groundwater basins.

Table 4-7: Llagas Subbasin Groundwater Recharge Facilities' Percent Operability During Construction summarizes the construction impacts on groundwater recharge operations for the facilities that recharge the Llagas Subbasin.

Table 4-7: Llagas Subbasin Groundwater Recharge Facilities' Percent Operability During Construction

Construction Segment	Duration	Recharge Facility Operation				
		Main Avenue Percolation Ponds	Madrone Channel Recharge Facility	San Pedro Recharge Ponds	Church Avenue Recharge Ponds	Instream Recharge (creeks)
Segment 1	6-7 months	100%	100%	100%	100%	100%
Segment 2	5-6 months	100%	33%	100%	100%	100%
Segment 3	2-3 months	0%	100%	100%	100%	100%

The District's planned phased construction sequence will ensure impacts to managed recharge are minimized during the construction of the new pipelines and the District anticipates that the Llagas Subbasin will not be severely impacted. Initial estimates are that managed recharge of the Llagas Subbasin will be reduced by approximately 14 percent during construction.

The groundwater subbasin is in good condition and water levels have recovered significantly after several years of unprecedented drought, in large part driven by the community's response for water use reduction and the District's sustainable groundwater management practices over the years. The planned facility outages, phased throughout construction of the proposed project, will reduce the managed recharge to the Llagas Subbasin, but are not expected to result in a substantial depletion of groundwater supplies.

The proposed project includes restoration of the Main and Madrone Pipelines whose purpose is to recharge of the Llagas groundwater basin underlying the cities of Morgan Hill and Gilroy. The proposed project would make the system more reliable to meet current and future subbasin recharge demands and would provide greater operational flexibility for the upper Llagas Subbasin recharge program in re-establishing the connection to Anderson Reservoir to diversify and ensure the long-term supply of local and imported water for groundwater recharge purposes.

Construction of the proposed project would include water used for controlling dust during construction activities, but would not result in substantial water use over existing conditions. Therefore, the proposed project would be beneficial to recharging the groundwater aquifer and would not result in the substantial depletion of groundwater supplies or interfere with the movement of groundwater, which would be considered a **less than significant impact**.

c) ***Less than Significant Impact.*** Construction activities associated with the proposed project could temporarily increase the potential for erosion from exposed sediments as discussed in subsection (a) above. As described above, implementation of the District BMP's including WQ-1 (Conduct Work from Top of Bank), WQ-2 (Limit Impacts from Staging and Stockpiling Materials), WQ-3 (Stabilize Construction Entrances and Exits), WQ-4 (Use Seeding for Erosion Control, Weed Suppression, and Site Improvement), WQ-5 (Maintain Clean Conditions at Work Sites), WQ-6 (Prevent Water Pollution), and

WQ-7 (Prevent Stormwater Pollution) have been incorporated into the proposed project (Section 3, Table 3) and would reduce the potential for soil erosion within the project area. This would be considered a **less than significant impact.**

d) ***Less Than Significant Impact.*** The proposed project would replace existing underground pipelines, install associated vault structures, and construct ancillary facilities (e.g. chemical feed station). Implementation of the proposed project would not significantly alter existing drainage patterns, including alteration of the course of a stream or river or substantial increase in the rate/amount of surface runoff that could lead to on-site or off-site flooding. This would be considered a **less than significant impact**.

e) ***Less than Significant Impact.*** The proposed project would result in a negligible increase in the amount of impermeable surfaces and therefore would not result in a additional runoff over existing conditions. Post-construction stormwater flow would be similar to pre-construction conditions with implementation of the proposed project. Therefore, the proposed project would not affect drainage capacity nor would it lead to a substantial addition of sources of polluted runoff, which would be considered a **less than significant impact**.

g, h) ***No Impact.*** The proposed project would not involve construction of housing or structures that would expose people or structures within the 100 year flood zone. Therefore, the proposed project would have **no impact** on the 100 year flood zone.

i) ***Less than Significant Impact.*** The project area is located within the dam inundation area for Anderson Dam, which is operated by the District. The District routinely inspects and monitors the condition of each dam and provides an annual surveillance report to the Division of Safety of Dams (DSOD) of the California Department of Water Resources to ensure the safety of the dams. According to FEMA, the project area is not located within a 100-year floodplain. Therefore, the proposed project would not expose construction workers working on the proposed project to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, which would be considered a **less than significant impact.**

j) ***No Impact****.* The topography of the project area is fairly level with the exception of the northeastern portion of the project area. Construction activities would occur primarily within existing roadways and the proposed project would not expose people or structures to mud flow. Based on the distance of the project area from the San Francisco Bay, workers within the project area would not be exposed to inundation by seiche. According to the Department of Conservation *Tsunami Inundation Maps*, the project area is not located in a tsunami inundation zone. Therefore, workers within the project area would not be subject to mudflow or inundation by a seiche or tsunami and therefore there would be **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

HM-1: Restrict Vehicle and Equipment Cleaning to Appropriate Locations
HM-2: Ensure Proper Vehicle and Equipment Fueling and Maintenance
HM-3: Ensure Proper Hazardous Materials Management
HM-4: Utilize Spill Prevention Measures
WQ-1: Conduct Work from Top of Bank

WQ-2: Limit Impacts from Staging and Stockpiling
WQ-3: Stabilizes construction and entrances and exits
WQ-4: Use Seeding for Erosion Control, Weed Suppression and Site Improvement
WQ-5: Maintain Clean Conditions at Work Sites
WQ-6: Prevent Water Pollution
WQ-7: Prevent Stormwater Pollution

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

MM WQ-1: ***Monitor Discharge Rates.*** If pipelines need to be discharged, the District shall ramp discharge rates slowly such that the increase in flow rate in the receiving water is gradual and scouring of the channel bed and banks does not occur.

MM WQ-2: ***Implementation of Erosion Control Measures.*** To protect exposed soils from erosion during pipeline dewatering, the District shall place erosion control blankets, mats, or geotextiles over the erodible surfaces. Any erosion control materials used within the channel or percolation ponds during discharges shall be removed immediately upon completion of water discharges. No plastic or monofilament netting shall be used on any erosion control materials. Flows shall be diverted around sensitive, actively eroding, or extremely steep areas to prevent erosion.

MM WQ-3: ***Monitor Discharge Locations for Erosion.*** The District shall monitor the discharge locations for signs of erosion. If erosion is evident, flow rates shall be reduced. If erosion continues to occur, discharges will be terminated until appropriate erosion control measures are implemented.

10. LAND USE AND PLANNING

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 policies of the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigated an environmental effect?				✓
c) Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan?				✓

ENVIRONMENTAL SETTING

The project area is located in eastern portion of the city of Morgan Hill and in unincorporated Santa Clara County within the City's SOI. Existing pipelines are located within paved roadways including Cochrane Road, East Main Avenue, and Half Road along the Main Avenue Pipeline, the Madrone Pipeline and the Half Road Lateral.

Surrounding Sensitive Receptors

The project area is primarily comprised of agricultural and rural residential uses. The nearest sensitive receptors include single family residential homes, which are located approximately 40 feet from the proposed limits of construction, as well as Live Oak High School, which has a track and football field and agricultural area that is used to board livestock approximately 150 feet east of the construction area along Half Road and buildings that are located within 1,000 feet of proposed construction activities.

Surrounding Land Use Designations

According to the *City of Morgan Hill General Plan*, surrounding land use designations in the project area include: Rural County and Single Family Low (1 to 3 dwelling units per acre) in the northeastern portion of the project area along Cochrane Road; "Rural County," "Residential Estate (0 to1 dwelling units per acre)," "Public Facilities," "Multi-Family Low (5 to 14 dwelling units per acre)," and "Industrial" from east to west along Half Road; and "Rural County" along East Main Avenue. According to the *County of Santa Clara General Plan*, the portions of the project area in unincorporated Santa Clara County in the City's SOI are designated "Agricultural Medium Scale."

According to the *City of Morgan Hill Zoning Map*, for the portions of the project area located within the City of Morgan Hill parcels to the northeast of Cochrane Road are zoned Residential Estate 40,000 district (RE-40,000) RPD and Single Family Medium Density 20,000 district (R1-20,000) RPD and parcels along Half Road in the vicinity of U.S. Highway 101 are zoned Medium Density Residential, 3,500 district (R2-3,500) and Planned Unit Development (PUD) to the north and Public Facility district (PF) at the Live Oak High School located south of Half Road. According to the *County of Santa Clara Zoning Map*, the remaining parcels located in unincorporated Santa Clara County are designated Exclusive Agriculture (A-20).

DISCUSSION

a) ***No Impact.*** The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community or between a community and an outlying area. The project area is located in a primarily agricultural and rural residential area within the City of Morgan Hill and unincorporated Santa Clara County within the City's SOI. The proposed project would replace existing underground pipelines and associated vault structures, as well as demolition and reconstruction of a chemical feed station near the Main Avenue Percolation Ponds. As such, the proposed project would not divide an established community and would have **no impact**.

b) ***No Impact****.* The proposed project would replace existing underground pipelines and associated vault structures, as well as demolition and reconstruction of a chemical feed station. The proposed project would not permanently change the existing land use within the project area or result in the development of land uses that would be incompatible with surrounding land uses. The proposed project would replace existing pipelines in order to restore the full capacity and to meet current recharge demands in the Llagas subbasin. Existing land uses would remain unchanged and the post-project conditions would not conflict with existing or future designated uses of surrounding land uses. Therefore, the proposed project would result in **no impact**.

c) ***No Impact.*** The proposed project is a covered activity in the Santa *Clara Valley Habitat Plan* (VHP), which is a join habitat conservation plan and natural communities conservation plan developed to serve as the basis for the issuance of incidental take permits and authorizations pursuant to Section 10 of the federal Endangered Species Act and the California Natural Community Conservation Planning Act. All activities associated with the proposed project must be implemented consistent with the requirements outlined in the VHP. The proposed project would comply with the applicable conditions in the VHP. Therefore, there would be **no impact** relating to conflict with an existing habitat conservation plan or natural community conservation plan.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

11. MINERAL RESOURCES

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resources that would be of value to the region and 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, and other land use plan?				✓

ENVIRONMENTAL SETTING

Minerals are any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances including, but not limited to, coal, peat and oil bearing rock, but excluding geothermal resources, natural gas and petroleum. Rock, sand, gravel and earth are also considered minerals by the Department of Conservation when extracted by surface mining operations. According to the *Geologic Map of Santa Clara County*, which shows mineral deposits within the County of Santa Clara, the project area does not contain any mineral resources. Neither the State Geologist nor the State Mining and Geology Board has classified any areas except the Communications Hill area in the City of San Jose as containing mineral deposits that are of statewide significance or for which the significant requires further evaluation.

DISCUSSION

a-b) ***No Impact.*** Since the project area does not contain any mineral resources, construction of the proposed project would not result in development or recovery of mineral resources

within the project area. Therefore, the proposed project would have **no impact** on mineral resources.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

12. NOISE AND VIBRATIONS

Would the project result in:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?		✓		
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			✓	
c) A substantial temporary or permanent increase in ambient noise levels in the project vicinity above levels existing without the project?		✓		
d) 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 Construction Noise Report was prepared for the proposed project by LSA Associates, Inc. (see Appendix C) in September 2016 due to the presence of sensitive receptors (e.g., residential uses and a school) within the project area. The findings of the report are incorporated into the analysis below.

ENVIRONMENTAL SETTING

Noise is usually 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.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and the project's effect on adjacent sensitive land uses.

Measurement of Sound. Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 dB; 20 dB are 100 times more intense than 1 dB; and 30 dB are 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dBA for each doubling of distance in a hard-site environment. Line source (noise in a relatively flat environment with absorptive vegetation) decreases 4.5 dBA for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events

occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The City uses the CNEL noise scale for long-term noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Surrounding Land Uses. The project area is located in the City of Morgan Hill and in unincorporated Santa Clara County in the City's SOI. Existing land uses adjacent to Half Road include agricultural, educational, and residential. Recreational facilities of Live Oak High School border the project area along Half Road and classrooms/buildings are located approximately 1,000 feet to the south. Single family residential homes are located adjacent to the proposed project with the nearest building facades located approximately 40 feet from the road. U.S. Highway 101 is located at the southwestern end of the project area.

Existing Noise Levels. According to the noise contour maps in the *City of Morgan Hill General Plan*, noise levels in the project vicinity range from 75 dBA to less than 60 dBA L_{dn} with the primary noise source being Highway 101.

Regulatory Framework

County of Santa Clara Noise Ordinance. *Chapter VIII of the Santa Clara Municipal Code* regulates noise and vibration in unincorporated Santa Clara County. Construction activities under the Municipal Code are prohibited between 7:00 p.m. and 7 a.m., daily except Sundays or holidays. In addition, construction activities are required to be conducted in a manner that the maximum noise levels at affected properties: 75 dBA for single and two family dwelling residential areas; 80 dBA for multi-family residential areas; and 85 dBA for commercial areas. The maximum noise levels for stationary equipment (10 days or more) would be 60 dBA for single and two family dwelling residential areas, 65 dBA for multifamily residential areas, and 70 dBA for commercial areas.

City of Morgan Hill Municipal Code Noise Ordinance. The City of Morgan Hill limits nuisances caused by excessive noise through Chapter 8.28.040 of the Municipal Code. The Municipal Code limits construction activities to the hours of 7:00 a.m. to 8:00 p.m., Monday through Friday, and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays. Construction is not allowed on Sundays or federal holidays.

The Municipal Code also limits maximum noise levels when adjacent to various uses. These standards include limiting the maximum sound generated by any use at the lot line to 70 to 75 dBA when adjacent to industrial or wholesale uses, 65 to 70 dBA when adjacent to offices, retail or sensitive industries, and 60 dBA when adjacent or contiguous to residential, park or institutional uses. Excluded from these standards are occasional sounds generated by the movement of railroad equipment, temporary construction activities, or warning devices. Chapter 8.28.040 D.1.d exempts public works projects and indicates the public works director shall set construction hours for these types of projects.

Chapter 18.48.135 states that no vibration shall be permitted which is discernible without instruments at the lot line of the establishment or use.

City of Morgan Hill General Plan. The Noise Element of the *City of Morgan Hill General Plan* sets forth noise and land use compatibility standards to guide development, and noise goals and policies to protect citizens from the harmful and annoying effects of excessive noise. Policies established in the Noise Element of the General Plan are associated with new development projects and not construction activities. Therefore, there are no applicable policies in the General Plan that would be applicable to the proposed project.

DISCUSSION

a, c, d) ***Potentially Significant Unless Mitigation Incorporated.*** Construction-related short-term noise levels would be higher than current existing ambient noise levels in the project area, but would cease once construction is complete. Once the project is operational, noise levels are not anticipated to increase as maintenance activities would be similar to existing conditions. Two types of short-term noise would likely occur during construction activities within the project area: 1) worker commute trips and the transport of construction equipment to the project area and 2) the operation of construction equipment.

Worker Commute Trips and the Transport of Construction Equipment. There would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (e.g. passing trucks at 50 feet would generate up to a maximum of 87 dBA L_{max}). However, the effect on longer term (hourly or daily) ambient noise levels would be minimal. Construction related vehicle traffic, including employee and material hauling trips, would vary throughout the construction period. According to the traffic analysis prepared for the proposed project (Appendix D), the estimated number of trips generated during project construction would be approximately 162 per day, assuming that excavation, demolition, material hauling, installation, backfill, and paving all occur simultaneously. This is a conservative analysis of the daily trips as the construction phases are not all likely to occur simultaneously. Additionally, the additional vehicle trips would be distributed spatially on local roadways throughout the day. The expected effect on overall traffic noise would therefore be less than a 2 dBA increase over the 24-hour period (LSA Associates 2016). This change would not be perceptible to the human ear in an outdoor environment. Therefore, short-term construction-related impacts associated

with worker commute and equipment transport to the project area would be considered **less than significant.**

Construction Equipment Noise Impacts. Construction of the proposed project is expected to include a backhoe loader, a compactor, a hydraulic excavator, various hand equipment, a dump truck, a road sweeper, material handlers, a motor grader, paving equipment, an air compressor, a wheel dozer, and a crane.

The estimated maximum noise level generated by construction equipment would be 85 dBA L_{max} at 50 feet (LSA Associates 2016). Each doubling of the sound sources with equal strength increases the noise level by approximately 3.0 dBA. Construction equipment is expected to be spread out between the various construction areas over a 17 month period; therefore, the maximum noise level is expected to reach 85 dBA L_{max} at a distance of 50 feet (LSA Associates 2016), which would be above the County's maximum noise level of 75 dBA for construction equipment noise sources of less than ten days and the maximum noise level of 60 dBA for construction periods of more than ten days.

The City does not have maximum noise level standards for construction equipment. However, the majority of the project area is located in unincorporated Santa Clara County and sensitive land uses (e.g. residential and schools) would therefore be exposed to noise levels greater than the County's standard, which is considered a **potentially significant impact**.

According to the *County of Santa Clara Municipal Code*, construction projects shall implement technically and economically feasible measures to maintain construction noise levels below the County's 75 dBA limit for single family residential area. Implementation of Mitigation Measure NOI-1: Noise Reduction Plan would reduce noise levels by requiring that noise reduction measures are incorporated during construction activities. This mitigation measure would reduce equipment noise levels by a minimum of 10 dBA during construction activities (LSA Associates 2016).Therefore, Mitigation Measure NO-1: Noise Reduction Plan would ensure that noise levels are within County thresholds and that this impact would be **less than significant**.

b) ***Less than Significant Impact***. Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernable. However, without the effects associated with the shaking of a building, there is less adverse reaction.

The proposed project would not use pile driving equipment, but would use construction equipment similar to large bulldozers. A large bulldozer would generate approximately 0.089 peak particle velocity (PPV) (inches/seconds) when measured at 25 feet (LSA Associates 2016). Groundborne vibration associated with the proposed project is temporary and would cease to occur after construction activities have been completed.

Experience with groundborne vibration indicates that vibration propagation is more efficient in stiff clay soils than in loose sandy soils. Shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at some distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne

vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

Vibration levels from construction equipment and activities, including bulldozers would be less than 0.09 inch/second of PPV at 25 feet from the project construction area (LSA Associates 2016). The California Department of Transportation (Caltrans) states that it takes at least 0.9 inch/second of PPV for the human response to be strongly perceptible, or 0.25 inch/second to be distinctly perceptible. The nearest sensitive indoor receptors are approximately 40 feet from the project area. None of the predicted vibration levels (all below 0.1 inch/sec) for sensitive uses (e.g. residential and educational uses) in the project vicinity would reach either of these two threshold levels (LSA Associates 2016). Therefore, vibration from construction equipment at sensitive receptors in the project area would be considered **less than significant.**

e, f) ***No Impact.*** The San Martin Airport is located approximately six miles southwest of the project area. According to the *Comprehensive Land Use Plan for the South County Airport*, the project area is well outside of the noise contours for the airport and therefore would not expose people working within the project area to excessive noise levels. Therefore, this would be considered **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

MM NOI-1 ***Noise Reduction Plan*****.** The District shall prepare a construction noise logistics plan that incorporates the following noise reduction measures to reduce noise level impacts at the sensitive receptors within the project area:

- During all project site excavation and grading, the project contractor shall equip and maintain all construction equipment with mufflers consistent with manufacturers' standards;
- When feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from the closest off-site sensitive receptors.
- The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and sensitive receptors nearest the project construction areas.
- Construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and the hours of 9:00 a.m. to 6:00 p.m. on Saturday per the County of Santa Clara Municipal Code and the City of Morgan Hill Municipal Code.
- A publicly visible sign shall be posted with the telephone number and contact information for the designated on-site construction manager available to receive and respond to noise complaints. This person shall take immediate action to validate and correct the complaint as soon as practical after the complaint is received.
- Per the County Noise Ordinance, for construction activities lasting ten days or more, temporary sound barriers shall be installed at all proposed construction areas located less than 160 feet from noise-sensitive land uses (e.g.

residential homes in the project vicinity). For construction activities lasting more than ten days, sound barriers shall be installed for areas within 1,000 feet of noise-sensitive land uses. The sound barriers shall be constructed in a manner that reduces noise levels by a minimum of 10 dBA.

13. POPULATION AND HOUSING

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				✓

ENVIRONMENTAL SETTING

The project area is located in the City of Morgan Hill and unincorporated Santa Clara County within the City's SOI. The project area is rural in nature and is surrounded by agricultural uses, low density residential uses, and Live Oak High School.

DISCUSSION

a) ***Less than Significant Impact***. The proposed project would not include any new housing, commercial or industrial space, result in the conversion of adjacent land uses, or provide access to previously inaccessible areas. The proposed project was initiated to restore the pipelines to full capacity to meet current and future groundwater recharge demands in the Llagas subbasin. The proposed project includes a connection to provide for additional groundwater recharge west of U.S. Highway 101. However, this future groundwater recharge project is not currently planned and the proposed project would not provide additional major infrastructure or increase the capacity of the existing water system. Therefore, the proposed project would not directly or indirectly induce substantial population growth. Therefore, the proposed project would have a **less than significant impact.**

b, c) ***No Impact.*** The proposed project would not include the demolition of existing housing within the project area or would displace existing housing or residents, which would necessitate the construction of replacement housing elsewhere. Therefore, the proposed project would have **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

14. PUBLIC SERVICES

Would the project result in the need for additional, or physically altered, public services or facilities, the provision of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any public service:	**Potentially Significant Issues**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Fire protection?				✓
b) Police protection?				✓
c) Schools?				✓
d) Parks?				✓
e) Other public facilities?				✓

ENVIRONMENTAL SETTING

The project area is located within the City of Morgan Hill and unincorporated Santa Clara County within the City's SOI. For the portions of the project area within the City of Morgan Hill, the project area is under the jurisdiction of the City of Morgan Hill Police Department and the California Department of Forestry and Fire Protection. For the portions of the project area within unincorporated Santa Clara County, the project area is under the jurisdiction of the County of Santa Clara Sheriff's Department and Santa Clara County Fire Department. The project area is within the Morgan Hill Unified School District. Nearby parks include the Anderson Lake Recreation Area located to the east and the Coyote Creek Parkway located to the northeast of the project area.

DISCUSSION

a, b) ***No Impact.*** Project activities would not contribute to an increased need for fire or police protection services, since the proposed project would not contribute to population growth or other long-term land use modifications. Therefore, the proposed project would have **no impact** to fire and police protection services.

c) ***No Impact.*** Classrooms at the Live Oak High School are located within 1,000 feet of the project area. However, the proposed project would result in short-term construction activities and is not anticipated to result in long-term effects to existing school facilities, nor would it contribute to any change in population, or other land use modifications that would impact the Morgan Hill Unified School District. Therefore, there are **no impacts** associated with the need to expand any school facilities.

d) ***No Impact.*** The proposed project would not result in substantial impacts associated with new or physically altered park facilities in order to maintain adequate recreational facilities for residents.

e) ***No Impact.*** Since the proposed activity would not contribute to population growth or other long-term land use modifications, the proposed project is not anticipated to affect other public facilities.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

15. RECREATION

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				✓

ENVIRONMENTAL SETTING

Parks in the vicinity of the project area include the Anderson Lake Recreation Area located to the east and the Coyote Creek Parkway located to the northeast of the project area. The trail along Madrone Channel is identified as a recreational trail on the *County of Santa Clara Trails Master Plan* (County of Santa Clara 1995) and in the *City of Morgan Hill Draft Bikeways, Trails, Parks and Recreation Master Plan* (City of Morgan Hill 2017).

DISCUSSION

a) ***Less than Significant Impact***. Anderson Lake County Park is located east of the project area. The park would not be utilized for project construction activities and use of the park is not anticipated to directly affect recreational users during construction activities. Park users may be temporarily disturbed by construction activities (e.g., noise, traffic) in the northeastern portion of the project area; however, this disturbance would be short-term and intermittent.

   The proposed project would not result in an increase in population that would increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Therefore, this would be considered a **less than significant impact**.

b) ***No Impact.*** The proposed project does not include construction or expansion of recreational facilities and would have **no impact**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

16. TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			✓	
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 Construction Traffic Analysis (TIA) was prepared for the proposed project by LSA Associates, Inc. in September 2016 (see Appendix D). The TIA was prepared consistent with the criteria established by Santa Clara Valley Transportation Authority (VTA) Traffic Impact Analysis Guidelines and the CEQA Guidelines.

ENVIRONMENTAL SETTING

Based on review of routes of construction traffic, the study area for the TIA analyzed includes the following intersections:

- Mission View Drive/Half Road
- Elm Road/Half Road
- Peet Road/Half Road
- Elm Road/Main Avenue
- Hill Road/Main Avenue
- Cochrane Road/Main Avenue
- Hill Road/Dunne Avenue

Study intersections are shown in Figure 8: Study Intersections.

Level of Service Methodology

According to the VTA *Traffic Level of Service Analysis Guidelines*, the most up-to-date version of the Highway Capacity Manual (HCM 2010) methodology is used to determine level of service (LOS) for both signalized and un-signalized intersections. The Highway Capacity Manual (HCM) methodology analyzes delay experienced by vehicles at an intersection. Because no permanent changes to the roadway network are contemplated as part of the project it is not necessary to reevaluate the streets in accordance with the Complete Streets Act. However, construction traffic control will comply with the California Joint Utility Traffic Control Manual, which accounts for the movement of pedestrians and bicycles during temporary traffic control.

The resulting delay is expressed in terms of level of service (LOS), where LOS A represents free-flow activity and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations.

Regulatory Framework

The County's threshold of significance for the Congestion Management Program (CMP) intersections is LOS E. Impacts of project traffic are considered significant if project traffic causes any intersection to deteriorate from a satisfactory (LOS A through E) to unsatisfactory LOS (LOS F). A significant impact would occur if the addition of project traffic increased the critical volume-to-capacity (v/c) ratio by 0.01 or greater and by four seconds or more in the average critical delay of a deficient intersection (LOS F) (County of Santa Clara 1994).

The City considers LOS A through D as satisfactory operations for the intersections and roadway segments in the project vicinity (City of Morgan Hill 2016). For the purpose of this analysis, impacts of project traffic are considered significant if project traffic causes any intersection to deteriorate from satisfactory (LOS A through D) to unsatisfactory LOS (LOS E or F). A significant impact would occur if the addition of project traffic increases the critical v/c ratio by 0.01 or greater and/or a four second or higher increase in the average critical delay of a deficient intersection (LOS E or F). For purpose of analyzing traffic and transportation impact, the City's more conservative threshold is used for intersections shared by the City and County.

DISCUSSION

a, b) ***Less than Significant Impact.*** Operation of the proposed project would have negligible effects to the project area as the number of inspections and maintenance activities would be similar to existing conditions and is not anticipated to generate additional vehicle trips. However, construction activities would result in additional traffic on the roadway network. An increase in traffic would occur from construction equipment moving from each staging area to locations within the construction area and from worker commute trips to and from the project area each day.

Construction Trip Generation. Three types of trips would be generated during each construction phase of the proposed project: (1) employee commute trips; (2) construction task equipment trips; and (3) off-site material-hauling trips. As presented in Table 4-~~7~~9: Project Trip Generation, the trip generation for each construction phase is composed of various amounts of these tree trip types.

To present a conservative analysis, the traffic analysis applied a conversion factor to the volume of heavy equipment and large trucks to passenger vehicle equivalent (PCE) to account for the slower movement and lack of mobility and since these vehicles would have a greater effect on intersection and roadway operations than passenger vehicles. A PCE factor of 2 was applied to equipment-delivery trips and material-hauling trips and a PCE factor of 1.5 was applied to the road sweeper, a medium-sized truck to convert the vehicle trip generation into a PCE trip generation.

Worker commute trips are presumed to arrive and leave from the project area in a personal vehicle (passenger car) during the a.m. and p.m. peak hours. Construction equipment is presumed to move from and return to the staging areas to various points within the construction area every day. The highest PCE trip-generating phases, the on-site material hauling and paving phases, were evaluated to distribute trips throughout the project area, which represents a conservative analysis of construction trips at each of the study intersections.

Off-site material trips would haul demolished pipeline and related materials that are not part of the backfill to the nearest landfill or material recovery facility throughout the workday. The proposed project is estimated to transport 12,750 truckloads of material off site over a 17-month construction schedule (i.e., 320 work days or 40 truckloads per day). Trips are expected to be distributed evenly in the work day.

Table 4-~~7~~9: Project Trip Generation presents the combined average daily traffic (ADT) for all three trip types (i.e., employee equipment, and off-site hauling), which is approximately 162 trips, which is 267 PCE trips. The proposed project is expected to generate approximately 74 a.m. peak hour PCE trips (35 inbound and 39 outbound) and 74 PM peak hour PCE trips (39 inbound and 35 outbound).

Construction Trip Assignment. Due to the travel patterns of each trip type (i.e., employee, equipment, and off-site hauling), project trips were distributed separately. The distribution of trips within the project area during the AM and PM peak hour is shown in Figure 9: Project Peak Hour Trip Distribution and Assignment.

Based on a geographical distribution of population, approximately 60 percent of the employee trips are estimated to originate in the San Jose area north of the project area

Figure 8: Study Intersections

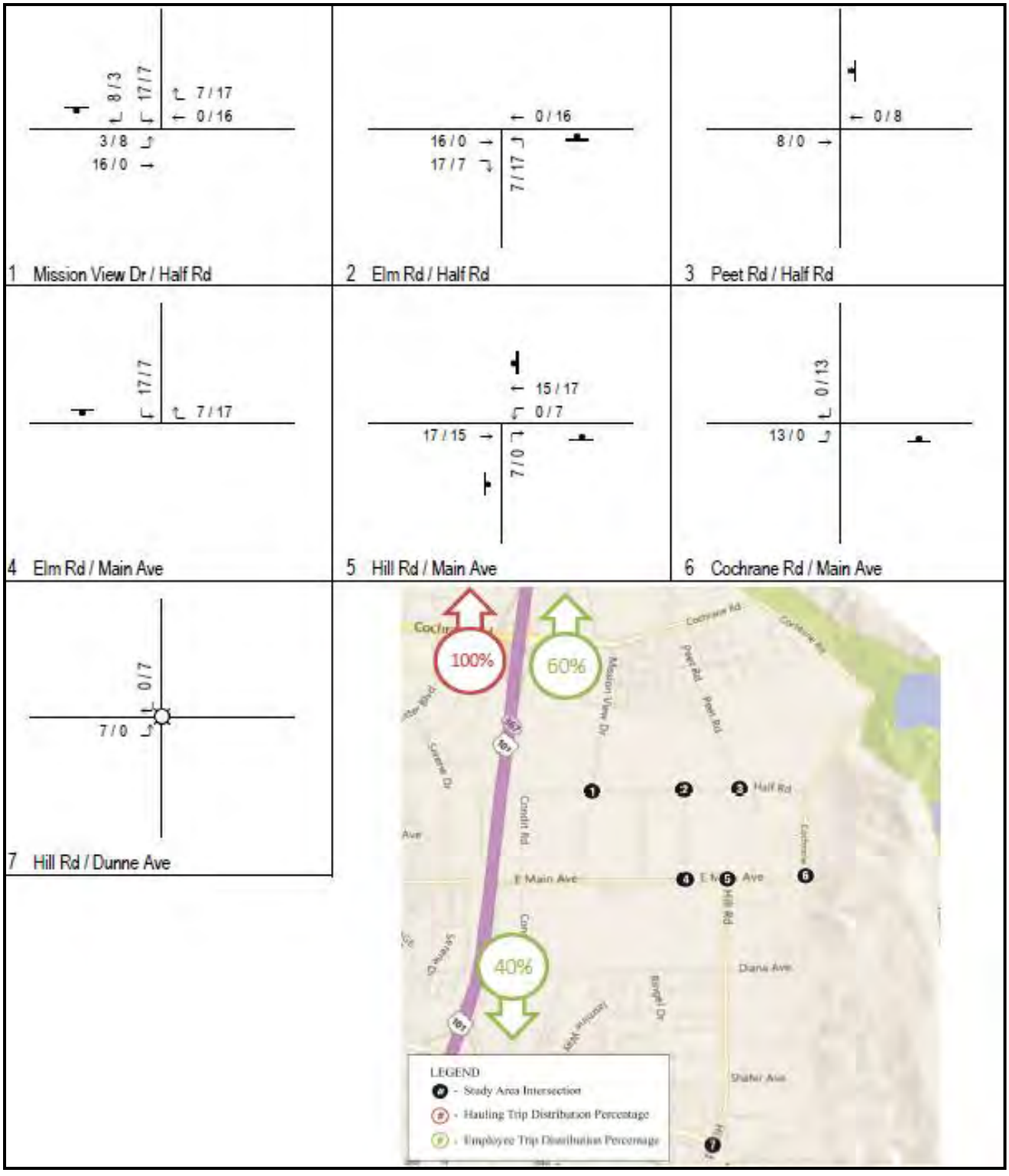
Source: LSA Associates, Inc. 2016

Table 4-~~7~~9: Project Trip Generation

Construction Vehicles					Vehicle Trip Generation							PCE Trip Generation						
Construction Phase (Vehicles and Equipment)	**Vehicles**	**Quantity**	**Type**	**PCE**	**ADT**	**AM Peak Hour**			**PM Peak Hour**			**ADT**	**AM Peak Hour**			**PM Peak Hour**		
						In	**Out**	**Total**	**In**	**Out**	**Total**		**In**	**Out**	**Total**	**In**	**Out**	**Total**
Vehicles and Trucks																		
Employee Commute	Vehicles	25	Passenger Car	1.0	50	25	0	25	9	25	25	50	25	0	25	0	25	25
Off-site Material Hauling	Trucks	5	Large Truck	2.0	80	5	5	10	5	5	10	160	19	10	20	19	10	20
Construction Task Equipment																		
Excavation and Pipeline Demolition	Backhoe Loader	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Hydraulic Excavator	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Material Handlers	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
				Subtotal	*6*	*0*	*3*	*3*	*3*	*0*	*3*	*12*	*0*	*6*	*6*	*6*	*0*	*6*
On-site Material Handling	Dump Truck	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Wheel Dozers	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Material Handlers	2	Large Truck	2.0	4	0	2	2	2	0	2	8	0	4	4	4	0	4
				Subtotal	*8*	*0*	*4*	*4*	*4*	*0*	*4*	*16*	*0*	*8*	*8*	*8*	*0*	*8*
Pipeline Installation and Backfill	Hand Equipment	3	Pick-Up Truck	2.0	6	0	3	3	3	0	3	6	0	3	3	3	0	3
	Road Sweeper	1	Medium Truck	2.0	2	0	1	1	1	0	1	3	0	2	2	2	0	2
	Crane	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
				Subtotal	*10*	*0*	*5*	*5*	*5*	*0*	*5*	*13*	*0*	*7*	*7*	*7*	*0*	*7*
Paving	Compactor	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Motor Graders	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
	Paving Equipment	2	Large Truck	2.0	4	0	2	2	2	0	2	8	0	4	4	4	0	4
				Subtotal	*8*	*0*	*4*	*4*	*4*	*0*	*4*	*16*	*0*	*8*	*8*	*8*	*0*	*8*
				Total	**162**	**30**	**21**	**51**	**21**	**30**	**51**	**267**	**35**	**39**	**74**	**39**	**35**	**74**

Source: LSA Associates, Inc. 2016

Figure 9: Project Peak Hour Trip Distribution and Assignment



Source: LSA Associates, Inc. 2016

and the remaining 40 percent are estimated to originate south of the project area on U.S. Highway 101. The trip distribution for the construction task equipment assumed a worst-case condition in which all phases of the proposed project were occurring simultaneously and crews would travel farthest away from the staging areas.

Off-site material-hauling trips would travel from staging areas to and from the U.S. Highway 101 ramps at Cochrane Road. Trips are distributed to Cochrane Road via Mission View Drive. Inclusive of employee trips, the project would add a total of 32 AM peak hour trips (25 inbound and 7 outbound) and 37 PM peak hour trips (20 inbound and 17 outbound) to Cochrane Road. This volume of trips represents approximately two percent of the capacity of a travel lane on Cochrane Road, which is two lanes in some sections and four lanes near US Highway 101. Therefore, the off-site material hauling trips would require approximately one percent of the capacity of Cochrane Road.

Existing Conditions. Peak-hour traffic volume data at study area intersections was collected in April 2016. Figure 10: Existing Traffic Volumes presents the existing AM and PM peak-hour turn-movement volumes for the study area intersections. The traffic volume data sheets for all study area intersections are included in Appendix D in the traffic impact analysis.

Existing Plus Project Conditions. Project PCE trips were added to the existing traffic volumes at the study area intersections. Figure 11 shows the resulting existing plus project AM and PM peak-hour traffic volumes in PCE trips. Table 4-~~8~~10: Level of Service of Existing Conditions and Existing Plus Project summarizes the results of the AM and PM peak-hour LOS analysis for all study area intersections, which are anticipated to operate at acceptable LOS in the AM and PM peak hours during project construction.

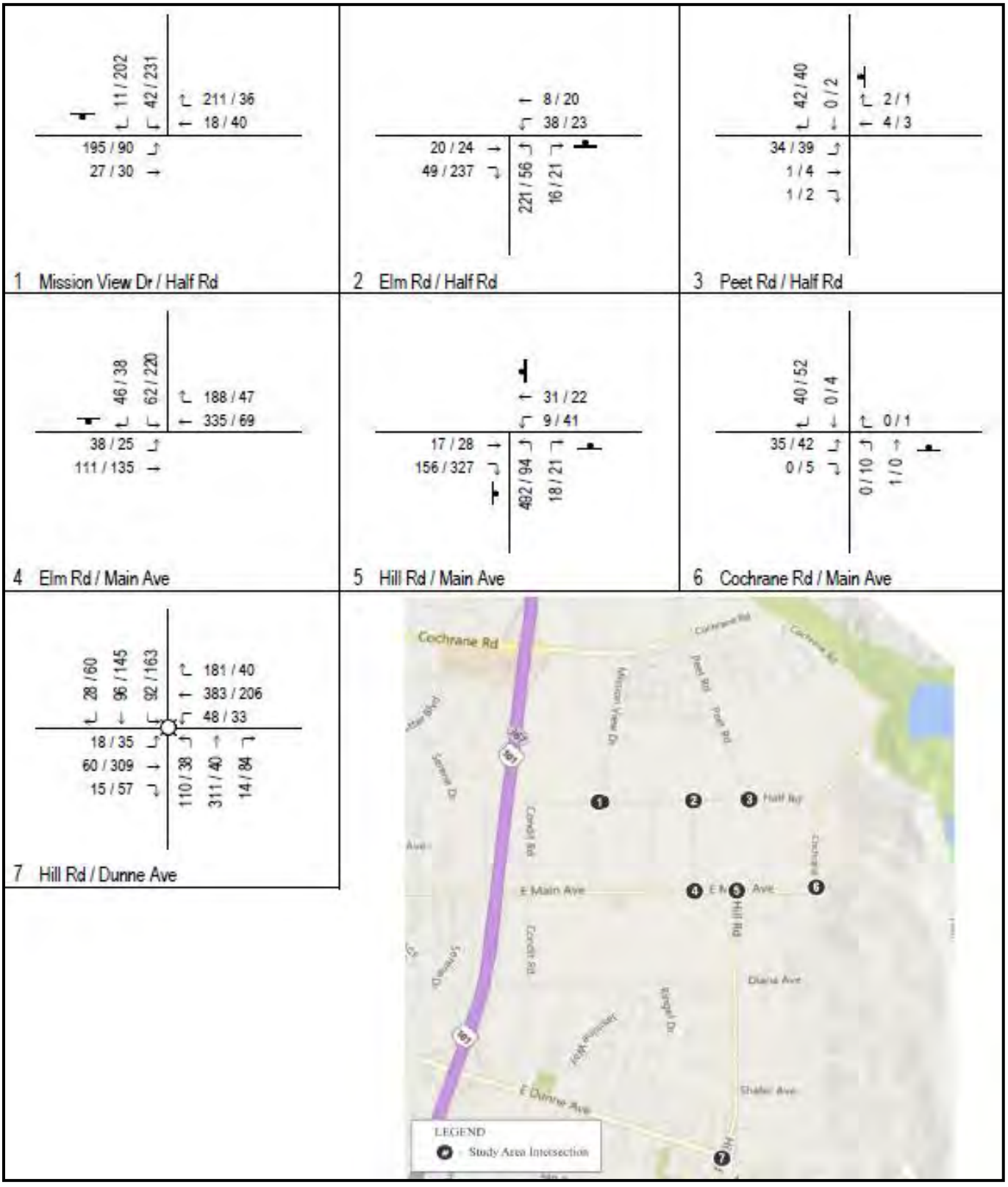
Table 4-~~8~~10: Level of Service of Existing Conditions and Existing Plus Project Conditions

Intersection[1]	Existing Conditions				Existing Plus Project Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Mission View Drive/Half Road (Shared)	15.6	C	15.8	C	16.4	C	17.4	C
Elm Road/Half Road (Shared)	11.5	B	10.5	B	11.8	B	10.8	B
Peet Road/Half Road (Shared)	8.30	A	8.30	A	8.40	A	8.40	A
Elm Road/Main Avenue (County)	18.6	C	14.4	B	19.7	C	14.5	C
Hill Road/Main Avenue (County)	17.9	C	9.30	A	19.5	C	9.60	A
Cochrane Road/Main Avenue (County	7.40	A	8.90	A	7.40	A	8.90	A
Hill Road/Dunne Avenue (City)[2]	13.5	B	12.6	B	14.1	B	13.1	B

Source: LSA Associates, Inc. 2016

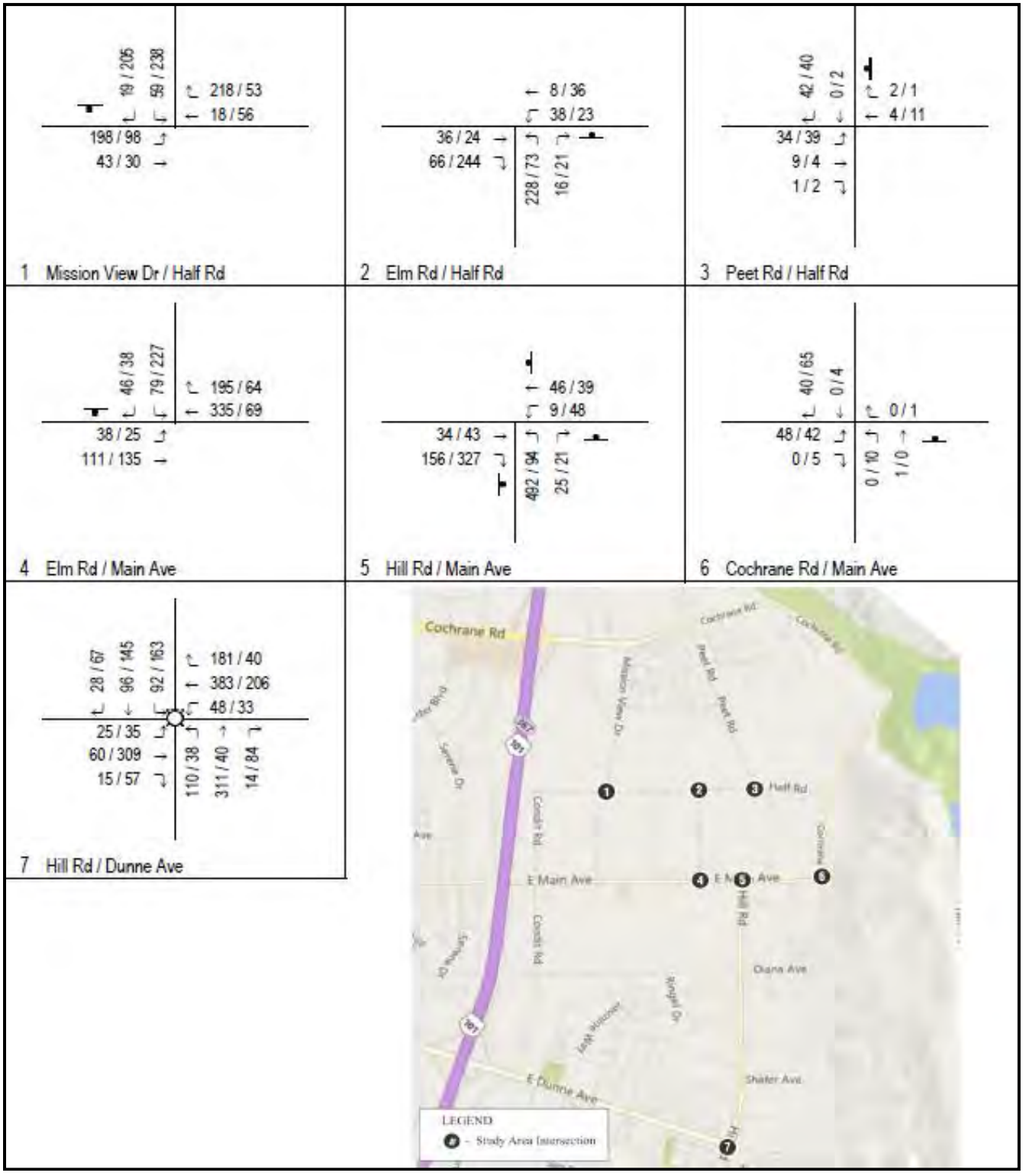
Notes:
1. Intersections are under the County of Santa Clara, the City of Morgan Hill or shared between agencies as noted.
2. Signalized Intersection
LOS = Level of Service
sec = second

Figure 10: Existing Peak Hour Traffic Volumes



Source: LSA Associates, Inc. 2016

Figure 11: Existing Plus Project Peak Hour Traffic Volumes



Source: LSA Associates, Inc. 2016

Based on the results of the Construction TIA noted in Table 4-~~8~~10, the proposed project is not anticipated to create or exacerbate the existing level of service of any of the study intersections. In addition, the proposed project includes implementation of BMP TR-1, which requires fencing, barriers, lights, flagging, guards and/or signs (as appropriate) to provide warning to the public of construction activities and would further minimize the effects from construction traffic within the project area. Therefore, the proposed project would have a **less than significant impact** on traffic conditions at the study intersections and roadway segments.

c) ***No Impact***. The San Martin Airport is located approximately six miles southwest of the project area. The proposed project is an infrastructure project and would not result in any changes to air traffic patterns or levels of air traffic within the project area. Therefore, the proposed project would result in **no impact** to the San Martin Airport.

d) ***Less Than Significant Impact***. The proposed project would not include new design features (e.g., new facilities or obstructions within public roadways) or alterations of existing features (e.g., road realignment). No incompatible uses or hazardous design features are associated with operation of the proposed project. However, construction of the proposed project would result in heavy vehicles and equipment accessing the project area via local roadways, including Cochrane Road, Half Road, and East Main Avenue. The presence of large, slow-moving equipment among the general-purpose traffic on roadways in the project area could result in temporary safety hazards. However, given the amount of equipment needed to implement the proposed project (see Table 2: Construction Equipment), traffic safety hazards would not be substantially increased. Therefore, the proposed project would result in a **less than significant impact** from an increase in traffic hazards. In addition, implementation of BMP TR-1 as part of the proposed project, which requires fencing, barriers, lights, flagging, guards and/or signs (as appropriate) to provide warning to the public of construction activities, would further minimize the effects from construction traffic within the project area.

e) ***Less than Significant Impact.*** The proposed project consists primarily of the replacement of existing pipelines within public roadways under the jurisdiction of the County of Santa Clara and City of Morgan Hill. Once completed, operation of the proposed project would include inspections and maintenance activities similar to existing conditions which would not result in inadequate emergency access. During construction, the District would coordinate with surrounding uses (e.g. Live Oak High School and residential uses) to ensure that access for emergency vehicles is maintained at all times during construction activities. Therefore, the proposed project would have a **less than significant impact** on emergency access.

f) ***Less Than Significant Impact.*** The proposed project would not conflict with or prevent Implementation of adopted plans, policies, or programs related to performance of circulation systems or programs supporting alternative transportation. The proposed project would not result in an increase in population, which would potentially affect transit service levels. Construction could temporarily affect pedestrian/bicycle routes that are located in proximity to the pipeline alignment (i.e. road shoulders). However, traffic patterns would return to existing conditions upon completion of the proposed project and there would be no permanent changes to the level of service standards, travel demands, or congestion after construction activities are completed. Therefore, since there would be only minor disruption to any pedestrian facilities during construction activities and no

permanent changes would occur, impacts of the proposed project to public transit, bicycle, or pedestrian facilities would be considered **less than significant**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

BMP TR-1: Incorporate Public Safety Measures

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

17. TRIBAL CULTURAL RESOURCES

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

Environmental Setting

Regulatory Framework

Effective July 1, 2015, Assembly Bill 52 (AB 52) requires (1) a lead agency to provide notice to any California Native American tribes that have requested notice of projects proposed by the lead agency, and (2) if a tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe. Topics that may be addressed during consultation include tribal cultural resources, the potential significance of project impacts, type of environmental document that should be prepared, and possible mitigation measures and project alternatives.

AB 52 creates a new category of resources, i.e., tribal cultural resources.

Section 21074(a) of the Public Resource Code defines Tribal Cultural Resources as:

1. *Sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native*

American tribe that are either of the following:

a. *included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or*
b. *included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or*
c. *a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.*

Because criteria a and b also meet the definition of a Historical Resource under CEQA, a Tribal Cultural Resource may also require additional consideration as a Historical Resource. Tribal Cultural Resources may or may not exhibit archaeological, cultural, or physical indicators.

Section 21073 of the Public Resources Code defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of the Statutes of 2004." This includes federally and non-federally recognized tribes.

Recognizing that California tribes are experts in their tribal cultural resources and heritage, AB 52 requires that CEQA lead agencies carry out consultation with tribes at the commencement of the CEQA process to identify Tribal Cultural Resources. Furthermore, because a significant effect on a Tribal Cultural Resource is considered a significant impact on the environment under CEQA, consultation is required to develop appropriate avoidance, impact minimization, and mitigation measures.

Summary of Tribal Consultation

AB 52 consultation requirements went into effect on July 1, 2015 for all projects that have not already published a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration, or published a Notice of Preparation of an Environmental Impact Report. At the time the draft Initial Study/Mitigated Negative Declaration was released for public review, the District had not received written requests from any California Native American Tribes to receive notifications and therefore, the procedures specified in Public Resources Code Sections 21080.3.1(d) and 21080.3.2 do not apply and no tribal consultation under AB 52 is required.

DISCUSSION

a) ***No Impact.*** According to the cultural resources investigation, there are two historic period houses in the project vicinity, but they have not been evaluated for the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR) and are not included on any local register of historical resources. Therefore, there will be **no impact** to the Tribal Cultural Resources that are listed or eligible for listing on the NRHP, CRHR, or the local register of historical resources.

b) ***Less than Significant Impact.*** The cultural resources study conducted for the proposed project did not suggest presence of Tribal Cultural Resources within the project area. Therefore, no known Tribal Cultural Resources have been identified (as defined in Section 21074) within the project area and the proposed project would not cause a

substantial adverse change in the significance of a known Tribal Cultural Resource. In the event that unknown Tribal Cultural Resources are encountered during construction activities, the District would implement BMP CU-1 (Accidental Discovery of Archaeological Artifacts or Burial Remains) as included in the project description in Section 3 (Table 3), which would require that work at the location of the find would be halted immediately within 100 feet of the find and a "no work" zone would be established utilizing appropriate flagging to delineate the boundary of the area. Impacts resulting from the destruction of tribal cultural resources would therefore be considered **less than significant**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

CU-1: Accidental Discovery of Archaeological Artifacts or Burial Remains

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

18. UTILITIES AND SERVICE SYSTEMS

Would the project result in a need for new, relocated, upgraded, or expanded utilities and service system facilities that could cause significant environmental impacts in order to maintain acceptable service levels or other performance objectives for:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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 storm water 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?				✓

ENVIRONMENTAL SETTING

The District manages an integrated water resources system that includes the supply of clean, safe water, flood protection and stewardship of streams on behalf of Santa Clara County's

1.8 million residents. The District manages ten dams and surface water reservoirs, three water treatment plants, and more than 275 miles of streams.

Water

The Main Avenue and Madrone Pipeline network is the main water supply system in south Santa Clara County required for recharging the Llagas groundwater subbasin, which underlies most of unincorporated Santa Clara County including the cities of Morgan Hill and Gilroy.

The City of Morgan Hill provides potable water service to its residential, commercial, industrial, and institutional customers within the City limits. The City's water system facilities include 14 groundwater wells, 10 potable water storage tanks, 10 booster stations, and over 160 miles of pressured pipes ranging from two to 14 inches in diameter.

Wastewater

The South County Regional Wastewater Authority Wastewater Treatment Plant provides wastewater service to the cities of Morgan Hill and Gilroy. The treatment plant has capacity to treat an average dry weather flow (ADWF) of 8.5 million gallons per day (mgd) and is currently permitted by the California Regional Water Quality Control Board, Central Coast Region to treat up to 8.5 mgd. The City of Morgan Hill has a growth control systems in place which limits unexpected increases in sewage generation. The ADWF for combined flows from Morgan Hill and Gilroy was approximately 6.8 million gallons per day in 2010 (with 2.9 mgd generated by Morgan Hill). Based on combined population projections for both cities, the current capacity of 8.5 mgd is anticipated to be reached in mid-2019. Morgan Hill is allocated 42 percent of the current 8.5 mgd treatment capacity, or 3.6 mgd, leaving approximately 0.7 mgd of remaining capacity allocation for future growth under the *City of Morgan Hill General Plan*.

Stormwater Drainage

The City of Morgan Hill is divided into several hydrologically distinct drainage areas. Each drainage area has a system of conveyance facilities, pumps, and detention basins to collect and dispose the runoff. The stormwater runoff from these areas is collected and ultimately discharged into creeks that flow through the City of Morgan Hill and are tributary to either Monterey Bay or San Francisco Bay.

Solid Waste

The nearest landfills to the project area include the Kirby Canyon Recycling and Disposal Facility located at 910 Coyote Creek Golf Drive, Morgan Hill, CA, which is located approximately six miles northwest of the project area, and the Guadalupe Sanitary Landfill, which is located approximately 22 miles northwest at 15999 Guadalupe Mines Road San Jose, CA. The Kirby Canyon Landfill has a maximum permitted capacity of 36,400,000 cubic yards with approximately 16,191,600 cubic yards of remaining capacity. The landfill is permitted to accept 2,600,000 tons per day. The Guadalupe Sanitary Landfill has a permitted capacity of 28,600,000 cubic yards and approximately 11,055,000 cubic yards of remaining capacity. The Guadalupe Sanitary Landfill is permitted to accept up to 1,300 cubic yards per day.

DISCUSSION

a) ***No Impact.*** The proposed project would not lead to an exceedance of wastewater treatment requirements of the applicable Regional Water Quality Control Board, as the proposed project would not generate or discharge wastewater. Therefore, the proposed project would have **no impact**.

b) ***No Impact.*** The proposed project would require the placement of temporary sanitary facilities during construction activities. District BMP WQ-8 (Manage Sanitary and Septic Waste) has been incorporated into the proposed project and would require that all temporary sanitary facilities that are located within the project area are in compliance with the California Division of Occupational Safety and Health (Cal/OSHA) regulation 8 California Code of Regulations 1526. However, the proposed project would not require or result in the construction of new water treatment facilities or expansion of such facilities. Therefore, the proposed project would have **no impact**.

c) ***No Impact.*** The proposed project would not affect the amount of on-site runoff as the amount of impervious surfaces would not increase over existing conditions. The proposed project would not lead to the expansion of existing stormwater facilities. No additional drainage facilities would be required and therefore this impact is considered **no impact**.

d) ***Less than Significant Impact.*** Construction of the proposed project would require potable or reclaimed water for dust suppression and potable water for the construction trailer. However, the amount of water required would be minimal and would be distributed to the project area via water trucks. After construction is completed, operation of the pipelines would be the same as existing conditions. Therefore, no new or expanded water supply entitlements would be required to serve the proposed project, which would be considered a **less than significant impact**.

e) ***No Impact.*** The proposed project does not include uses (e.g. residential, commercial, etc.) that would result in wastewater discharge that would require treatment at the South County Regional Wastewater Authority (SCRWA) Wastewater Treatment Plant. Therefore, the proposed project would not result in a determination by any wastewater treatment provider, which serves or may serve the proposed project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. The proposed project would therefore have **no impact** on wastewater treatment facilities.

f) ***Less Than Significant Impact.*** Implementation of the proposed project would generate solid waste associated with construction activities, including construction materials, pipes, trench spoils, and general refuse. Given the removal of 100 tons of demolished pipe; 27,632 cubic yards of soil; and 1,257 cubic yards of asphalt to the landfill as construction waste and the remaining capacity available at the local landfills in the project vicinity, the proposed project would be served by a landfill with sufficient permitted capacity to accommodate the proposed project's solid waste disposal needs. The proposed project would not generate additional waste once completed. Impacts related to solid waste disposal are therefore considered **less than significant.**

g) ***Less than Significant Impact.*** The proposed project would comply with all applicable Federal, State, and local statutes and regulations related to solid waste, including

recycling programs. The proposed project would also be required to comply with Assembly Bills 939 and 1327, which require measures to enhance recycling and source reduction. Thus, impacts in this regard would be **less than significant**.

BEST MANAGEMENT PRACTICES (SEE DETAILS IN TABLE 3)

None required.

MITIGATION MEASURES (SEE MMRP IN SECTION 5)

None Required.

19. MANDATORY FINDINGS OF SIGNIFICANCE

Does the project:	Potentially Significant Issues	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
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?		✓		
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 the past projects, the effects of other current projects, and the effects of probable future projects.)		✓		
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

a) ***Potentially Significant Unless Mitigation Incorporated.*** Implementation of the BMPs and mitigation measures proposed in this Initial Study/Mitigated Negative Declaration would ensure that construction and operation of the proposed project would not substantially degrade the quality of the environment; substantially reduce the habitat, population, or range of a plant or animal species; or eliminate important examples of California history or prehistory.

b) ***Potentially Significant Unless Mitigation Incorporated.*** As defined by Section 15344(b) of the CEQA Guidelines "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable [sic] foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." The proposed project is located in an agricultural and rural residential area.

Several projects would occur near and within the project area during construction activities including the following:

- Borello Elementary Elementary School – The proposed Borello Elementary School would be located on a ten acre parcel on Peet Road, which would include Kindergarten through fifth grade for approximately 600 students. Due to the contamination of the property from pesticides, remediation of the parcel is planned by the Morgan Hill Unified School District over approximately 45 days in the Summer of 2017. Remediation would involve hauling approximately 2,000 tons of soil in 2,100 truckloads. Construction of the elementary school is planned for 2018 following soil remediation.

- Anderson Dam Seismic Retrofit Project - The proposed Anderson Dam Seismic Retrofit Project would include excavation and reconstruction of Anderson Dam embankments, mining of rock from nearby borrow areas, raising the dam crest and spillway, constructing a new intake structure in the reservoir, and constructing new outlet facilities to the spillway and creek below the dam. Construction activities may overlap with the proposed project as is proposed at the end of 2018 or early 2019.

- Mission Ranch Residential Project – The Mission Ranch residential development includes 328-unit residential development project at the corner of Mission View and Cochrane Road. The development is currently under construction.

- San Sebastian Residential Project – The San Sebastian residential development is an approved 244-unit residential development project located on Peet Road between Hill Road and Cochrane Road. The development is under construction.

Construction activities associated with these projects may overlap with activities associated with the proposed project. However, impacts associated with the proposed project would be primarily construction related and would be reduced to less than significant with implementation of mitigation measures contained herein. Therefore, the proposed project would not make a considerable contribution toward a cumulative impact from construction activities. Additionally, the proposed project would not generate a significant amount of criteria air pollutants and would therefore not result in a cumulatively considerable impact to regional air quality or global climate change.

c) ***Potentially Significant Unless Mitigation Incorporated.*** As described herein in this Initial Study/Mitigated Negative Declaration, any potential environmental impacts from the proposed project would be reduced to less than significant with the implementation mitigation measures incorporated herein impacts to aesthetics, cultural resources, biological resources and noise would not result in substantial adverse effects on human beings.

SECTION 5: MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

Section 5 represents the Mitigation, Monitoring and Reporting Program (MMRP). The mitigation measures contained in this section are compiled from the measures identified in Section 4 of this Mitigated Negative Declaration. For each, the timeframe for implementation, responsible party for implementation and responsibility for oversight are identified.

The MMRP will be adopted by the District Board of Directors for implementation by District contractor with District oversight, as appropriate. Additionally, implementation of the MMRP will be reported and tracked consistent with CEQA Guidelines Section 15097 and permit reporting conditions.

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
Biological Resources					
Implementation of Tree Protection Measures	BIO-1	The District shall implement the following tree protection measures during construction activities in the northeastern portion of the project area from Barnard Road on Cochrane Road to the northeastern limit of construction at the entrance to Anderson Reservoir (Figure 7: Significant Trees in the Project Area). These measures would ensure that the native oak trees in the northeastern portion of the project area are protected during construction activities. • Establish a "Tree Protection Zone" during construction, including the area from at least the tree base extending to the drip line of the canopy. Temporary storage of excavated material shall not be made in the Tree Protection Zone. No grading, compaction, or operation of heavy equipment within the Tree Protection Zone may occur at any time. • Avoid and preserve larger roots (> 2' diameter) where possible in the construction area. • If larger roots cannot be avoided, roots should be severed with a clean, sharp implement (pruning saw, lopers). Large roots that are cut should be kept moist using wet burlap or similar until the project is complete and backfilled. • If any pruning of larger limbs (≥4" diameter) or large roots (≥ 2" diameter) is required within the construction area, it shall be approved by a Certified Arborist. • Where roots are encountered in the excavation area, efforts to keep the roots moist and minimize exposure to direct sun or heat should be made. This	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
		could include using burlap, nylon tarps, plywood, or similar barrier to protect the exposed roots during construction. • To the extent feasible, construction activities shall occur during the second half of the year, between August and December, outside of the growing season when tree growth and development has declined.			
Cultural Resources					
Conduct Archaeological Monitoring and Preparation of a Data Recovery Plan if Avoidance is Not Feasible	CR-1	A qualified professional archaeologist shall monitor ground disturbing activities during construction activities within the archaeologically sensitive area along Cochrane Road between Coyote Road and Barnard Road in the northeastern portion of the project area. The monitoring shall continue until ground disturbing activities are complete or until the monitoring archaeologist is satisfied that there is no likelihood of encountering intact archaeological deposits based observations in the field. If archaeological resources are identified in the project area during construction activities, the archaeological monitor shall examine the area closely and temporarily maker the extent of the cultural deposit. Archaeological sites that appear intact and are potentially significant shall be recorded on the California Department of Parks and Recreation 523 Forms and photographed. If the evaluation determines that the deposit is neither a historical nor a unique archaeological resource, avoidance of the deposit is not necessary. If an	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
		archaeological resource is determined to be a historical resource or unique archaeological resource, the following shall be implemented: a data recovery plan shall be developed in consultation with descendent community representatives: resource shall be recorded; a report of findings shall be prepared; and the recovered archaeological materials shall be preserved at an appropriate curation facility (e.g. Sonoma State University Curation Facility). Upon completion of the evaluation, the archaeologist shall prepare a report to document the methods and results of the investigation that shall be submitted to the District, the descendent community involved in the investigation, and the Northwest Information Center.			
Preservation of Paleontological Resources If Discovered During Construction	CR-2	If any potentially unique paleontological resources (fossils) be encountered during construction activities, work shall be halted immediately within 50 feet of the discovery. The District shall be notified immediately, and a qualified paleontologist shall be retained to determine the significance of the discovery. Based on the significance of the discovery, the qualified paleontologist shall present options to the District for protecting the resources. Appropriate action may include avoidance, preservation in place, excavation, documentation, and/or data recovery, and shall always include preparation of a written report documenting the find and describing steps taken to evaluate and protect significant resources. The District will implement feasible and appropriate recommendations and mitigation measures of the qualified paleontologist for any unanticipated discoveries. Such measures may include	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
		avoidance, preservation in place, excavation, documentation, curation, data recovery or other appropriate measures.			
Hydrology and Water Quality					
Monitoring of Dewatering Discharge Rates	WQ-1	If pipelines need to be discharged, the District shall ramp discharge rates slowly such that the increase in flow rate in the receiving water is gradual and scouring of the channel bed and banks does not occur.	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District
Erosion Control During Construction Activities	WQ-2	To protect exposed soils from erosion during pipeline dewatering, the District shall place erosion control blankets, mats, or geotextiles over the erodible surfaces. Any erosion control materials used within the channel or percolation ponds during discharges shall be removed immediately upon completion of water discharges. No plastic or monofilament netting shall be used on any erosion control materials. Flows shall be diverted around sensitive, actively eroding, or extremely steep areas to prevent erosion.	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District
Monitoring of Discharge Locations for Erosion	WQ-3	The District shall monitor the discharge locations for signs of erosion. If erosion is evident, flow rates shall be reduced. If erosion continues to occur, discharges will be terminated until appropriate erosion control measures are implemented.	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
Noise					
Noise Reduction Plan	NO-1	The District shall prepare a construction noise logistics plan that incorporates the following noise reduction measures to reduce noise level impacts at the sensitive receptors within the project area: • During all project site excavation and grading, the project contractor shall equip and maintain all construction equipment with mufflers consistent with manufacturers' standards; • When feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from the closest off-site sensitive receptors. • The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and sensitive receptors nearest the project construction areas. • Construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and the hours of 9:00 a.m. to 6:00 p.m. on Saturday per the County of Santa Clara Municipal Code and the City of Morgan Hill Municipal Code. • A publicly visible sign shall be posted with the telephone number and contact information for the designated on-site construction manager available to receive and respond to noise complaints. This person shall take immediate action to validate and correct the complaint as soon as practical after the complaint is received.	During Construction Activities	Santa Clara Valley Water District	Santa Clara Valley Water District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
		• Per the County Noise Ordinance, for construction activities lasting ten days or more, temporary sound barriers shall be installed at all proposed construction areas located less than 160 feet from noise-sensitive land uses (e.g. residential homes in the project vicinity). For construction activities lasting more than ten days, sound barriers shall be installed for areas within 1,000 feet of noise-sensitive land uses. The sound barriers shall be constructed in a manner that reduces noise levels by a minimum of 10 dBA.			
Santa Clara Valley Habitat Plan					
Avoid Direct Impacts on Legally Protected Plant and Wildlife Species	Condition 1	Compliance with this measure would necessitate avoiding take of nesting white tailed kites, either by doing construction during the non-breeding season or by conducting pre-construction surveys and maintaining appropriate buffers around kite nests that contain eggs or young.	During Construction Activities	Contractor	District
Maintain Hydrologic Conditions and Protect Water Quality	Condition 3	Compliance with this measure necessitates implementing the measures listed in Chapter 6 of the Santa Clara Valley Habitat Plan. These measures are BMPs to protect water quality. Many of them overlap or are similar to existing District BMPs.	During Construction Activities	Contractor	District
Wetland and Pond Avoidance	Condition 12	Compliance with this measure requires implementation of avoidance and minimization measures listed in Chapter 6 on pages 6-56 through 6-58 of the VHP.	During Construction Activities	Contractor	District

MAIN AND MADRONE PIPELINE RESTORATION PROJECT MITIGATION MONITORING AND REPORTING PROGRAM SUMMARY TABLE					
Environmental Issue	**Measure Element #**	**Mitigation Measure**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Responsibility for Oversight**
Tricolored Blackbird	Condition 17	Compliance with this measure is necessitates conducting a field investigation to identify and map potential nesting substrate as described on pages 6-70 and 6-71 of the VHP. Nesting substrate includes flooded, thorny or spiny vegetation.	During Construction Activities	Contractor	District

SECTION 6: REPORT PREPARATION

This section lists those individuals who contributed to the preparation of the Initial Study/Mitigated Negative Declaration.

Santa Clara Valley Water District

Erika S. Carpenter, Environmental Planner II
Emmanuel Aryee, Capital Engineering Manager
Debra Caldon, Water Resources Planning Unit Manager
Jae Abel, Biologist III
John Chapman, Vegetation Program Specialist/Certified Arborist
Joel Jenkins, Senior Civil Engineer
Victor Gutierrez, Associate Civil Engineer
Marisela Benitez, Assistant Engineer II
Valerie Onuoha, Assistant Engineer I

LSA Associates, Inc.

Amy Fischer, Principal
Jesse Madsen, Air Quality and Noise Specialist
Andrew Pulcheon, Principal/Cultural Resources
Lora Holland, M.A., RPA, Cultural Resources Manager
Tony Petros, Principal/Transportation Planner
Arthur Black, Associate/Transportation Planner

H.T. Harvey and Associates

Steve Rottenborn, Ph.D., Principal-in-charge
Kelly Hardwicke, Ph.D., Senior Wetland/Botany Ecologist
Ginger Bolen, Ph.D., Project Manager
Robin Carle, M.S., Senior Wildlife Ecologist

SECTION 7: REFERENCES

1. Bay Area Air Quality Management District (BAAQMD). *CEQA Guidelines*. 2011 and 2012.

2. BAAQMD. *2010 Clean Air Plan*. September 15, 2010.

3. California Department of Toxic Substances Control (DTSC). 2016. *Envirostor Database website. Available at:* http://www.envirostor.dtsc.ca.gov/public/. Accessed May 13, 2016.

4. Cal Fire, 2008: "Santa Clara County FHSZ Maps, Fire Hazard Severity Zones." Available at: http://www.fire.ca.gov/fire_prevention/fhsz_maps_santaclara.php. Accessed May 13, 2016.

5. Department of Conservation. 2010. *Santa Clara County Important Farmlands Map*. Available at: ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/2010/scl10.pdf . Accessed: May 11, 2016

6. Department of Conservation (DOC). *Tsunami Inundation Maps.* Available online at: http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Pages/ind ex.aspx. Accessed on May 18, 2016.

7. Department of Conservation, State of California Resources Agency. 2010. *Seismic Hazard Zones, San Jose East Quadrangle.* 2001.

8. Department of Forestry and Fire Protection. 2002. *Timberland Site Class on Private Lands Zoned for Timber Production.*

9. Federal Emergency Management Agency (FEMA), 2009. Santa Clara County California and Incorporated Areas, Map ID 06085C0089H FEMA Map Service Center. 18 May. Available online at: https://msc.fema.gov/portal/search?AddressQuery=East%20Main%20Avenue%2C%20Morgan%20Hill%2C%20CA%20

10. HT Harvey and Associates. *Main and Madrone Pipelines Restoration Project, Biological Resources Report.* October 2016.

11. LSA Associates, Inc. *Air Quality Impact Analysis, Main and Madrone Pipeline Restoration Project.* September 2016.

12. LSA Associates, Inc. Construction *Traffic Analysis, Main and Madrone Pipeline Restoration Project.* September 2016.

13. LSA Associates, Inc. *Cultural Resources Study for the Main Avenue and Madrone Pipeline Project-near Morgan Hill, Santa Clara County, California*. June 2016.

14. LSA Associates, Inc. *Noise Impact Analysis, Main and Madrone Pipeline Restoration Project.* September 2016.

15. Morgan Hill, City of. *Morgan Hill 2035 General Plan.* Adopted July 2016.

16. Morgan Hill, City of. *Draft Bikeways, Trails, Parks and Recreation Master Plan*. February 2017.

17. Natural Resources Conservation Service (NRCS). Web Soil Survey. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed on March 3, 2016.

18. Parikh. *Geotechnical Investigation, Main and Madrone Pipeline Restoration Project, Santa Clara County*. May 2016.

19. San Jose, City of. *Addendum to the Final Environmental Impact Report for the Zanker Material Recycling Facility Project* (SCH #2007022071). April. Available online at: http://www.sanjoseca.gov/DocumentCenter/View/14481. Accessed February 18, 2016.

20. Santa Clara Valley Water District. *Integrated Water Resources Planning Study.* 2003.

21. Santa Clara Valley Water District. *Anderson Dam Inundation Maps.* 2009.

22. Santa Clara, County of. *Comprehensive Land Use Plan for the South County Airport.* 2008.

23. Santa Clara, County of. *Santa Clara County General Plan 1995-2010*. 1994.

24. Santa Clara, County of. *Chapter VIII of the Santa Clara Municipal Code.*

25. Santa Clara, County of. *Countywide Trails Master Plan*. 1995.

26. Santa Clara, County of, City of San Jose, Morgan Hill, and Gilroy, Santa Clara Valley Water District, and Santa Clara Valley Transportation Authority. 2012a. *Final Santa Clara Valley Habitat Conservation Plan,* August 2012. Available online at: http://scv-habitatplan.org/www/default.aspx

27. Santa Clara, County of, City of San Jose, Morgan Hill, and Gilroy, Santa Clara Valley Water District, and Santa Clara Valley Transportation Authority. 2012b. *Final Santa Clara Valley Habitat Plan Final Environmental Impact Report / Final Environmental Impact Statement,* August 2012. Available online at: http://scvhabitatplan.org/www/Portals/_default/images/default/Final%20Habitat%20Plan/2a_SCVHP_EIR-EIS_Vol-1_Final_Aug2012.pdf

28. Santa Clara, County of. 2016. Williamson Act Program. Available at: https://www.sccgov.org/sites/dpd/Programs/WA/Pages/WA.aspx. Accessed: August 19, 2016.

29. State Water Resources Control Board (SWRCB). 2001. *Geotracker Database.* Available online at: http://geotracker.waterboards.ca.gov/. Accessed on June 30, 2016.

30. State of California, Department of Natural Resources. *Geologic Map of Santa Clara County, California (Showing Mine and Mineral Deposits).* Available online at: http://cgsdigitalarchive.conservation.ca.gov/cdm/ref/collection/p16780coll6/id/349. Accessed on April 22, 2016.

31. University of California Museum of Paleontology (UCMP). *UCMP Database Web Site* Accessed on May 13, 2016. Available online at: *http://ucmpdb.berkeley.edu/*.

Personal Communication

Personal Communication with Casino Fajardo, Director of Construction and Modernization, Morgan Hill Unified School District, September 13, 2016.

Personal Communication with Karl Bjarke, Public Works Director, City of Morgan Hill, September 14, 2016.

APPENDIX A

Air Quality Impact Analysis

AIR QUALITY IMPACT ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL
COUNTY OF SANTA CLARA, CALIFORNIA

LSA

September 2016

AIR QUALITY IMPACT ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL
COUNTY OF SANTA CLARA, CALIFORNIA

Submitted to:

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Prepared by:

LSA Associates, Inc.
5084 N. Fruit Avenue Suite 103
Fresno, CA 93711
(559)490-1210

LSA

September 2016

TABLE OF CONTENTS

APPENDIX

FIGURES AND TABLES

FIGURES

TABLES

AIR QUALITY IMPACT ANALYSIS

A. INTRODUCTION

LSA Associates, Inc. (LSA) has completed an air quality impact analysis (AQIA) to evaluate the potential air quality impacts associated with the proposed Santa Clara Valley Water District (District) Main Avenue and Madrone Pipeline Restoration Project (project) in the City of Morgan Hill (City) in Santa Clara County (County), California. Portions of the project are located within the City's urban limit line and the remaining portions are outside the urban limit line but within the City's sphere of influence. Two different alignment options are under consideration. The project location and a detailed vicinity map are shown in Figure 1. Alignment Options 1 and 2 are shown in Figures 2 and 3, respectively.

This AQIA has been prepared using the methodology and assumptions contained in the Bay Area Air Quality Management District (BAAQMDs) *CEQA Air Quality Guidelines*.[1] The analysis includes an air quality emission analysis conducted using the California Air Resources Board (ARB) Roadway Construction Emissions Model version 7.1.5.1 (RoadMod) to quantify the amount of air emissions expected during the construction period and annual air emissions to be generated during operation and maintenance of the replacement pipeline. LSA analyzed both alignment options. Because the construction activities and existing conditions are essentially the same for both alignment options, the analysis in this report summarizes the results of both analyses.

B. PROJECT DESCRIPTION

The proposed project would restore the Main Avenue and Madrone pipelines in an area that lies partially within the City of Morgan Hill and partially in an unincorporated area of Santa Clara County, bordering the City and within the City's sphere of influence. Surrounding uses include low-density residential and agricultural, as well as a high school with buildings located approximately 1,000 feet from the project. The project site is generally bound to the southwest by US Highway 101 (US 101), and to all other directions by agricultural land interspersed with low-density residential developments.

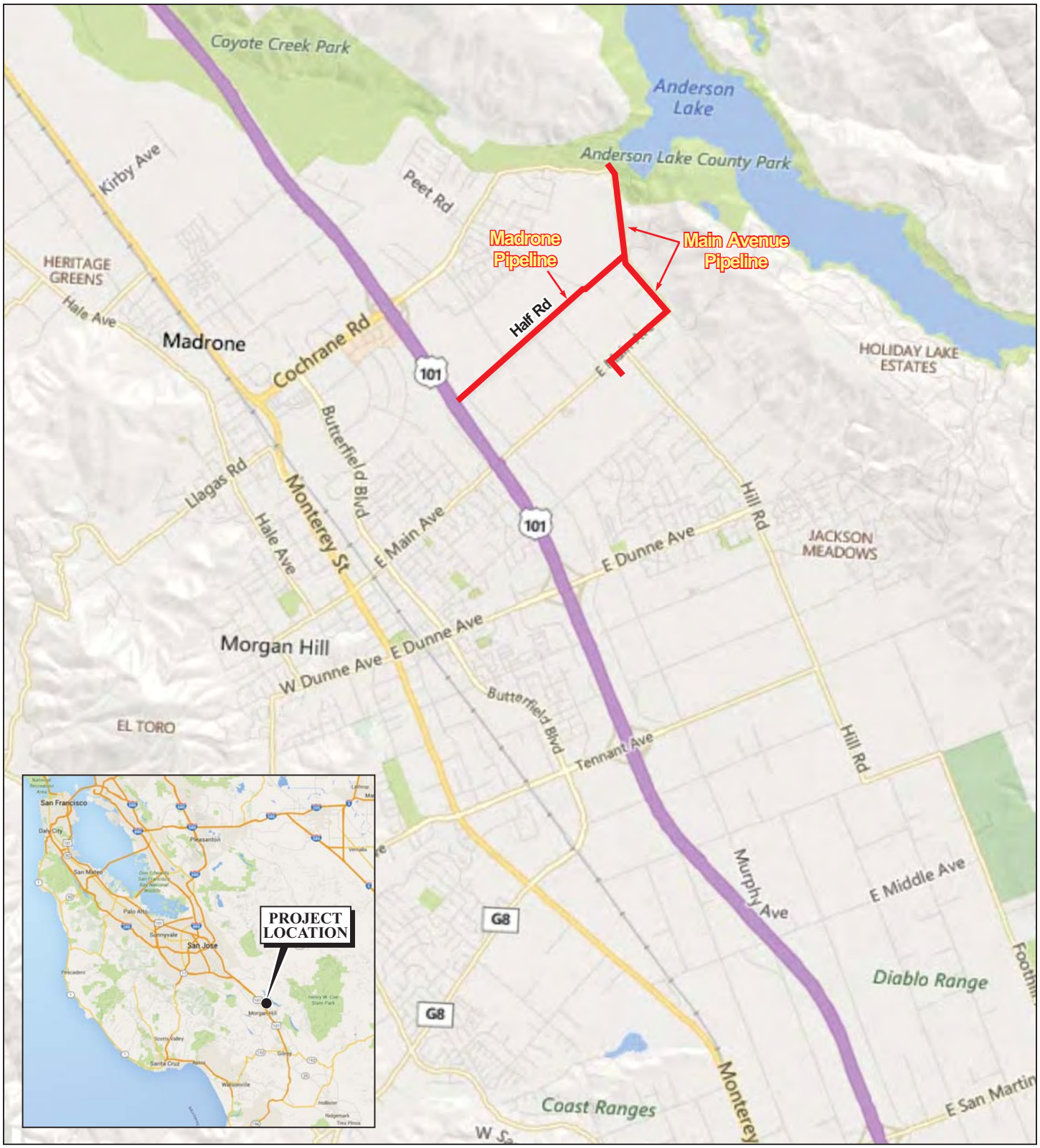
Construction is expected to begin July 2017 and require 17 months for completion. The proposed project would be fully operational by November 2018. Construction phases would include demolition, excavation and fill, pipeline installation, and pavement restoration, with several of the phases likely occurring simultaneously during portions of the project. The demolition phase would include the demolition and removal of existing asphalt, pipelines and a 100 square foot chemical feed station. Excavation and fill would use the open-trench method and would require the removal of approximately 153,300 cubic yards of soil and replacement with approximately 2,900 cubic yards of pipeline, 3,400 cubic yards of imported bedding, and 146,700 cubic yards of backfill, leaving 6,300

[1] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines.* May.

cubic yards to be exported to the nearest landfill. Approximately 13,960 feet of 30 to 36 inch diameter pipeline would be installed. Construction includes installation of underground utility vaults and construction of a new chemical feed station. Asphalt would be restored and a new chemical feed station would be constructed closer to Main Avenue Ponds.

Two alignment options are under consideration. Both alignment options would require similar construction activities including pipeline length and excavation volume. Alignment Option 1 and Alignment Option 2 are shown in Figures 2 and 3, respectively. The pipeline segments are arranged as follows.

- Segment 1 is composed of the 2,800 linear feet (LF) of 16-inch diameter Main Avenue Pipeline from the Anderson Reservoir outlet to the Cochrane and Half Road intersection. Pipeline for Segment 1 would be replaced with 36-inch pipe.
- Segment 2 is composed of the 6,300 LF of 24-inch diameter and 30-inch diameter Main Avenue Pipeline from the Cochrane and Half Road intersection to the Madrone Channel. Pipeline for Segment 2 would be replaced with 30-inch pipe.
- Segment 3 is composed of the remaining 4,860 LF of 16-inch, 18-inch, and 24-inch diameter Madrone Pipeline from the Cochrane and Half Road intersection to the Main Avenue Ponds. Pipeline for Segment 3 would be replaced with 30-inch pipe.
- Segment 4, which is an alternative route for Segment 3 under Alignment Option 2, would be composed of 400 LF of 30-inch diameter pipe running southwest from Main Avenue to the intersection of Elm Road and Main Avenue and approximately 2,100 LF of 30-inch diameter pipe running northwest from Elm Road to Half Road intersection. In total, 2,500 LF of 30-inch diameter pipe would be installed connecting Main Avenue and Half Road via Elm Road.



LSA

FIGURE 1

N

0 2000 4000

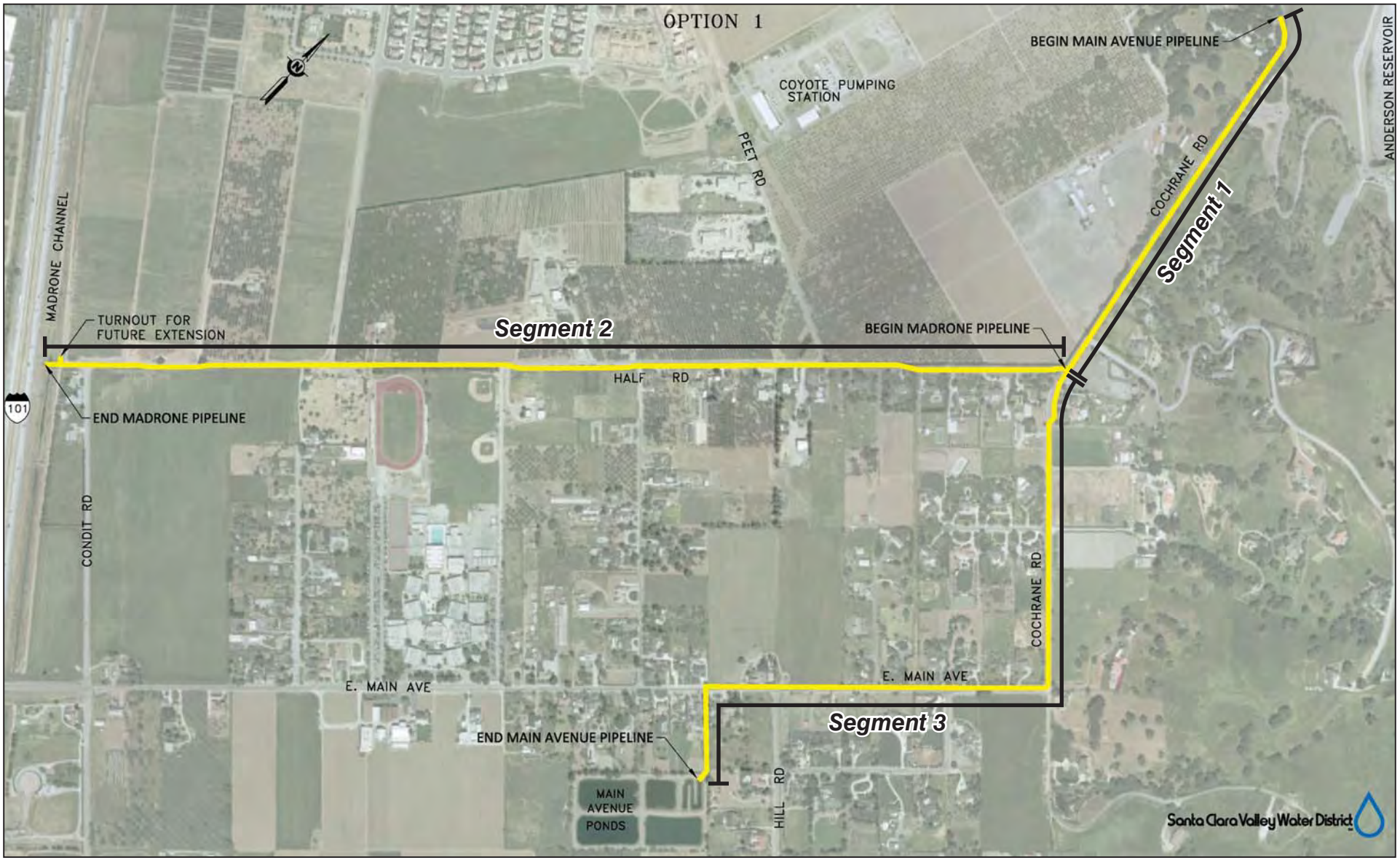
FEET

SOURCE: Bing Maps

Main Avenue and Madrone Pipeline Restoration Project

Project Location and Regional Vicinity Map

I:\SWD1501\G\Project Location.cdr (5/24/2016)



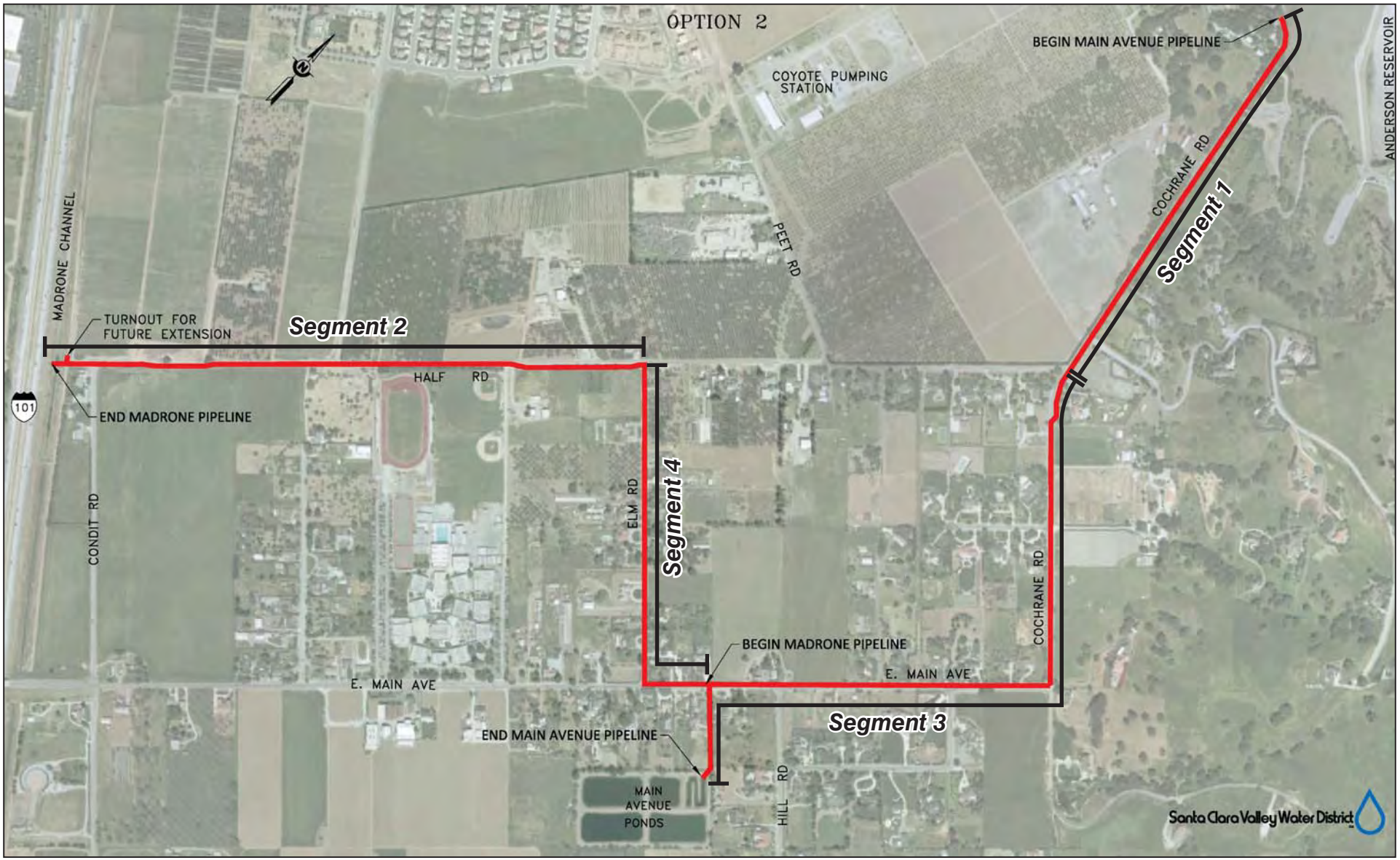
LSA

FIGURE 2

Main Avenue and Madrone Pipeline Restoration Project
Alignment Option 1

SOURCE: Santa Clara Valley Water District

I:\SWD1501\G\Alignment Option 1.cdr (8/24/2016)



LSA

FIGURE 3

Main Avenue and Madrone Pipeline Restoration Project
Alignment Option 2

SOURCE: Santa Clara Valley Water District

I:\SWD1501\G\Alignment Option 2.cdr (8/24/2016)

C. AIR QUALITY BACKGROUND

This section provides background information on air pollutants and their health effects. It also provides information the California Air Resources Board Air Quality and Land Use Handbook[2] (ARB Handbook), a description of the general health risks of toxics, and the significance criteria for project evaluation.

1. Air Pollutants and Health Effects

Both State and federal governments have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally.

The primary pollutants of concern in the project area are O_3, CO, and PM. Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the Air Basin's projected attainment target goals for nonattainment criteria pollutants.

Because of the conservative nature of the significance thresholds, and the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity.

This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic gases (ROG).

Occupants of facilities such as schools, day care centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

[2] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

Ozone. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide.CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. While CO transport is limited, it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

Particulate Matter. Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is categorized in two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the California Air Resources Board (ARB), studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks, and studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function growth in children. The ARB also reports that Statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[3]

Nitrogen Dioxide. NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung

[3] California Air Resources Board, 2011. *Fact Sheets*. Website: www.arb.ca.gov/htm/fslist.htm#Health.pdf. October.

function and may reduce resistance to infection. On January 22, 2010, the U.S. Environmental Protection Agency (USEPA) strengthened the health-based National Ambient Air Quality Standards (NAAQS) for NO_2.

Sulfur Dioxide. SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 also reduces visibility and the level of sunlight at the ground surface.

Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the USEPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants. In addition to the criteria pollutants discussed above, TACs are another group of pollutants of concern. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the USEPA and ARB. In 1998, ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB has completed a risk management process that identified potential cancer risks for a range of activities and land uses that are characterized by use of diesel fueled engines. High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

The BAAQMD regulates TACs using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, in order to provide a quantitative estimate of health risks. As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. Monitoring

data and emissions inventories of TACs help the BAAQMD determine health risk to Bay Area residents.

Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for slightly over 50 percent of the average calculated cancer risk from ambient air in the Bay Area. According to the BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline. Due to this reduction, the calculated average cancer risk based on monitoring results has been reduced to 143 in 1,000,000; however, this risk does not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources – primarily "off-road" sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in urban parts of the Bay Area, while construction equipment typically operates for a limited time at various locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic.

Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined. The ARB Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines. The technology for reducing diesel particulate matter emissions from heavy-duty trucks is well established, and both State and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. ARB anticipates that by 2020 average Statewide diesel particulate matter concentrations will decrease by 85 percent from levels in 2000 with full implementation of the Diesel Risk Reduction Plan, meaning that the Statewide health risk from diesel particulate matter is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000. It is likely that the Bay Area cancer risk from diesel particulate matter will decrease by a similar factor by 2020.

Table 1: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust • Natural events, such as decomposition of organic matter	• Reduced tolerance for exercise • Impairment of mental function • Impairment of fetal development • Death at high levels of exposure • Aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust • High temperature stationary combustion • Atmospheric reactions	• Aggravation of respiratory illness • Reduced visibility • Reduced plant growth • Formation of acid rain
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight	• Aggravation of respiratory and cardiovascular diseases • Irritation of eyes • Impairment of cardiopulmonary function • Plant leaf injury
Lead (Pb)	• Contaminated soil	• Impairment of blood functions and nerve construction • Behavioral and hearing problems in children
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuel • Construction activities • Industrial processes • Atmospheric chemical reactions	• Reduced lung function • Aggravation of the effects of gaseous pollutants • Aggravation of respiratory and cardiorespiratory diseases • Increased cough and chest discomfort • Soiling • Reduced visibility
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels • Smelting of sulfur-bearing metal ores • Industrial processes	• Aggravation of respiratory diseases (asthma, emphysema) • Reduced lung function • Irritation of eyes • Reduced visibility • Plant injury • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board (ARB), 2016.

Table 2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a]		Federal Standards [b]		
		Concentration [c]	Method [d]	Primary [c,e]	Secondary [c,f]	Method [g]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	–		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO_2)[h]	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Gas Phase Chemi-luminescence	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	–	
Lead (Pb) [j,k]	30-day average	1.5 µg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3 (for certain areas)[k]	Same as Primary Standard	
	Rolling 3-month average [i]	–		0.15 µg/m^3		
Sulfur Dioxide (SO_2)[i]	24-Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)[i]	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3)	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[i]	–	
Visibility-Reducing Particles [l]	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride [j]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Table notes included on next page.

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

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

[g] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

[h] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb are identical to 0.100 ppm.

[i] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standards to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[j] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[l] In 1989, the ARB converted both the general Statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the Statewide and Lake Tahoe Air Basin standards, respectively.

°C = degrees Celsius
ARB = California Air Resources Board
USEPA = United States Environmental Protection Agency
$\mu g/m^3$ = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
ppm = parts per million
ppb = parts per billion

Source: California Air Resources Board, 2015.

2. Greenhouse Gases and Global Climate Change

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2° Celsius (°C) or 1.1 ± 0.4° Fahrenheit (°F) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other greenhouse gases (GHGs) are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.[4]

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this air quality analysis, the term "GHGs" will refer collectively to the six gases listed above only.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere

[4] The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

("atmospheric lifetime"). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e). Table 3 shows the GWP for each type of GHG. For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

Table 3: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoromethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: IPCC, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.*

The following discussion summarizes the characteristics of the six GHGs and black carbon.

Carbon Dioxide (CO_2). In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic out gassing, decomposition of organic matter and evaporation from the oceans. Human caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO_2 each year, far outweighing the 7 billion tons of man-made emissions of CO_2 each year. Nevertheless, natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and consequently, the gas is building up in the atmosphere.

In 2012, CO_2 emissions from fossil fuel combustion accounted for approximately 94 percent of U.S. CO_2 emissions and approximately 86.5 percent of California's overall GHG emissions (CO_2e)[5] from 2000-2012. The transportation sector accounted for California's largest portion of CO_2 emissions, with gasoline consumption making up the greatest portion of these emissions. Electricity generation was California's second largest category of GHG emissions.

Methane (CH_4). Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and

[5] California Environmental Protection Agency, Air Resources Board, 2014. *California Greenhouse Gas Emission Inventory: 2000-2012.* May.

in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California. Methane accounted for approximately 7.2 percent of gross climate change emissions (CO_2e) in California from 2000-2014.[6]

Total annual emissions of methane are approximately 500 million tons, with manmade emissions accounting for the majority. As with CO_2, the major removal process of atmospheric methane a chemical breakdown in the atmosphere cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

Nitrous Oxide (N_2O). Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California. Nitrous oxide emissions accounted for approximately 2.9 percent of man-made greenhouse gas emissions (CO_2e) in California, 2000-2012. [7]

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF_6). Hydrofluorocarbons are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.[8] Perfluorocarbons and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs. Hydro-fluorocarbons, PFCs, and SF_6 accounted for about 4.1 percent of man-made greenhouse gas emissions (CO_2e) in California, 2000-2012. [9]

Black Carbon. Black carbon is the most strongly light-absorbing component of PM formed by burning fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of $PM_{2.5}$ and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in the atmosphere, black carbon can absorb a million times more energy than CO_2.[10] Black carbon contributes to climate change both directly, such as absorbing sunlight, and indirectly, such as affecting cloud formation. However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global-warming.

[6] Ibid.

[7] Ibid.

[8] The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

[9] Ibid.

[10] U.S. EPA, 2015. *Black Carbon*. Website: www3.epa.gov/blackcarbon/basic.html (accessed on May 9, 2016). September.

Most U.S. emissions of black carbon come from mobile sources (52 percent), especially diesel engines and vehicles. The other major source is open biomass burning, including wildfires, although residential heating and industry also contribute. The ARB estimates that the annual black carbon emissions in California have decreased approximately 70 percent between 1990 and 2010 and are expected to continue to decline significantly due to controls on mobile diesel emissions.

3. Air Quality Regulatory Setting

The USEPA and the California ARB regulate direct emissions from motor vehicles. The BAAQMD is the regional agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as monitoring ambient pollutant concentrations.

Federal Clean Air Act. The 1970 Federal Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

California Clean Air Act. In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain CAAQS for carbon monoxide, ozone, sulfur dioxide and nitrogen dioxide by the earliest practical date. The California Clean Air Act provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan (CAP) shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

California Air Resources Board (ARB) Handbook. The California ARB has developed an Air Quality and Land Use Handbook[11] which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the ARB Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The ARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools and playgrounds.

Land use designations with air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners and large gasoline service

[11] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

stations. Key recommendations in the ARB Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day.
- Within 1,000 feet of a major service and maintenance rail yard.
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries.
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet).
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The ARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site specific meteorology, freeway truck percentages or other factors that influence risk for a particular project site. The purpose of the land use compatibility analysis is to further examine the project site for actual health risk associated with the location of new housing on the project site, as required under the City's General Plan.

Bay Area Air Quality Management District. The BAAQMD has jurisdiction over most air quality matters in the San Francisco Bay Area Air Basin. The BAAQMD is tasked with implementing certain programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. The BAAQMD prepares plans to attain State and national ambient air quality standards.

The Clean Air Plan guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD is in the process of updating the Clean Air Plan. The BAAQMD 2010 Clean Air Plan is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter and greenhouse gas emissions.

The Bay Area 2010 Clean Air Plan, which was adopted on September 15, 2010, by the BAAQMD board of directors:

- Updates the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Provides a control strategy to reduce ozone, PM, TACs, and greenhouse gases in a single, integrated plan;
- Reviews progress in improving air quality in recent years; and
- Establishes emission control measures to be adopted or implemented in the 2010 to 2012 timeframe.

City of Morgan Hill Municipal Code. The City of Morgan Hill's Municipal Code addresses air pollution emissions in Section 18.48.025 – Air Pollution. The Code requires all uses to conform to

the standards established by the San Francisco Bay Area Air Quality Maintenance District, and does not contain any other requirements.[12]

The County of Santa Clara Municipal Code does not contain any specific provisions related to air quality.

4. Global Climate Change Regulation

This section describes regulations related to Global Climate Change at the Federal, State and local level.

Federal Regulations. The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change, including the ones described below.

On September 22, 2009, the USEPA issued a final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. In general, this national reporting requirement will provide the USEPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publicly-available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial GHGs, along with vehicle and engine manufacturers, will report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this rule.

On December 7, 2009, the USEPA Administrator signed an endangerment finding action under the Clean Air Act, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change. This USEPA action does not impose any requirements on industry or other entities. However, the endangerment findings are a prerequisite to finalizing the GHG emission standards for light-duty vehicles mentioned below.

On April 1, 2010, the USEPA and the Department of Transportation National Highway Traffic Safety Administration (NHTSA) announced a final joint rule to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. USEPA has established the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA has adopted the Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act. The USEPA GHG standards require light-duty vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile in model year 2016, equivalent to 35.5 miles per gallon. The USEPA and the NHTSA also established standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses.

[12] Morgan Hill, City of. *Morgan Hill Municipal Code: Chapter 18.48 Performance Standards.*

In May 2010, the USEPA sought to tailor existing regulations to accommodate GHG emissions for all stationary sources. However, the tailoring rule was challenged by several States, and the Supreme Court ruled on June 23, 2014 that the USEPA cannot tailor an existing provision in the Clean Air Act. The Court ruled that the USEPA may establish a de minimis threshold level for GHG (similar to the General Conformity Rule). On August 19, 2015, USEPA published rule removing the tailoring provision vacated by the Court. USEPA announced plans to proposed de minimis threshold for GHG in June 2016.

State Regulations. The ARB is the lead agency for implementing climate change regulations in the State. Since its formation, the ARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Executive Order S-3-05 (2005). Governor Arnold Schwarzenegger signed Executive Order S-3-05 on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. The executive order declared that increased temperatures could reduce snowpack in the Sierra Nevada Mountains, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established California's GHG emissions reduction targets, which established the following goals:

- GHG emissions should be reduced to 2000 levels by 2010;
- GHG emissions should be reduced to 1990 levels by 2020; and
- GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce GHGs. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from State agencies as well as numerous other boards and departments. The CAT members work to coordinate Statewide efforts to implement global warming emission reduction programs and the State's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the Statewide GHG targets that were established in the executive order and further defined under Assembly Bill 32, the "Global Warming Solutions Act of 2006" (AB 32). The first CAT Report to the Governor and the Legislature was released in March 2006, which it laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The CAT Report to the Governor and Legislature and will be updated and issued every two years thereafter; the most recent was released in December 2010.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The ARB has established the level of GHG emissions in 1990 at 427 MMT CO_2e. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT.

AB 32 requires the ARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures.[13] The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The Scoping Plan, even after ARB approval, remains a recommendation. The measures in the Scoping Plan will not be binding until after they are adopted through the normal rulemaking process. The ARB rulemaking process includes preparation and release of each of the draft measures, public input through workshops, and a public comment period, followed by an ARB hearing and rule adoption.

In addition to reducing GHG emissions to 1990 levels by 2020, AB 32 directed the ARB and the newly created CAT to identify a list of "discrete early action GHG reduction measures" that could be adopted and made enforceable by January 1, 2010. On January 18, 2007, Governor Schwarzenegger signed Executive Order S-1-07, further solidifying California's dedication to reducing GHGs by setting a new Low Carbon Fuel Standard. The Executive Order sets a target to reduce the carbon intensity of California transportation fuels by at least 10 percent by 2020 and directs the ARB to consider the Low Carbon Fuel Standard as a discrete early action measure.

In June 2007, the ARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on GWP Refrigerants, and Landfill CH_4 Capture).[14] Discrete early action measures are measures that were required to be adopted as regulations and made effective no later than January 1, 2010, the date established by Health and Safety Code Section 38560.5. The ARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures. These measures relate to truck efficiency, port electrification, reduction of PFCs from the semiconductor industry, reduction of propellants in consumer products, proper tire inflation, and SF_6 reductions from the non-electricity sector. The combination of early action measures is estimated to reduce State-wide GHG emissions by nearly 16 MMT.[15]

In December 2008, ARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 169 MMT of CO_2e, or approximately 30 percent from the State's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent from 2002-2004 average emissions). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

[13] California Air Resources Board, 2008. *Climate Change Scoping Plan: a framework for change*. December.

[14] California Air Resources Board, 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. October.

[15] California Air Resources Board, 2007. "ARB approves tripling of early action measures required under AB 32" News Release 07-46. Website: www.arb.ca.gov/newsrel/nr102507.htm. October 25.

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- The Low-Carbon Fuel Standard (15.0 MMT CO_2e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e).

The Scoping Plan identifies 18 emissions reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related GHG targets, vehicle efficiency measures, goods movement, solar roof programs, industrial emissions, high speed rail, green building strategies, recycling, sustainable forests, water, and air. The measures would result in a total reduction of 174 MMT CO_2e by 2020.

On August 24, 2011, the ARB unanimously approved both ARB's new supplemental assessment and re-approved its Scoping Plan, which provides the overall roadmap and rule measures to carry out AB 32. The ARB also approved a more robust CEQA equivalent document supporting the supplemental analysis of the cap-and-trade program.

The ARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014, which is currently underway. The First Update identifies opportunities to leverage existing and new funds to further drive greenhouse gas emission reductions through strategic planning and targeted low carbon investments. The First Update defines ARB's climate change priorities until 2020, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 greenhouse gas emission reduction goals and defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" greenhouse gas reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. The ARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target established in Executive Order B-30-15.

ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions (meanwhile, ARB is also developing an additional protocol for community emissions). ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of SB 375.

State Regulations. The ARB is the lead agency for implementing climate change regulations in the State. Since its formation, the ARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems.

City of Morgan Hill General Plan. The City of Morgan Hill's current General Plan[16] does not address greenhouse gas emissions. The City has not yet completed a Climate Action Plan or Greenhouse Gas Reduction Plan. However, Policy NRE-15.3 of the *Revised 2035 General Plan* states that the City will utilize policies in the General Plan denoted with the green leaf symbol as the City's greenhouse gas emissions reduction strategy.[17] These policies are applicable to development projects or actions the City will take to reduce GHG emissions and would not be applicable to this project.

County of Santa Clara Climate Action Plan. The County of Santa Clara *Climate Action Plan for Operations and Facilities*[18] focuses on County operations, facilities, and employee actions that will reduce GHG emissions, energy and water consumption, solid waste, and fuel consumption. The proposed project would restore/replace existing pipelines and none of the strategies in the Climate Action Plan would be directly applicable.

D. ENVIRONMENTAL SETTING

1. Attainment Status

The ARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA also designates areas as attainment, nonattainment, or classified. Table 4 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

2. Existing Climate and Air Quality

The project site borders the City of Morgan Hill, which is located in the Santa Clara Valley climate subregion in the San Francisco Bay Area. The valley is bound by the Bay to the north and by mountains to the east, south and west. Summer days are warm, summer nights are cool, and winter temperatures are mild. Mean maximum temperatures at the northern end of the valley are in the low-80s during the summer and the high-50s during the winter, and mean minimum temperatures range from the high-50s in the summer to the low-40s in the winter. Temperature extremes are greater further inland, where the Bay does not have as strong of a moderating effect.

[16] Morgan Hill, City of, 2010. *Morgan Hill General Plan.* February.

[17] Morgan Hill, City of, 2016. *Revised Morgan Hill 2035 General Plan.* June 23.

[18] Santa Clara, County of, 2009. *Climate Action Plan for Operations and Facilities.* September.

Table 4: San Francisco Bay Area Attainment Status

	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration [c]	Attainment Status
Ozone (O_3)	8-Hour	0.070 ppm (137µg/m^3)	Nonattainment [h]	0.075 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable [e]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment [f]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m^3)	Attainment	0.100 ppm	Unclassified
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Not Applicable	0.053 ppm (100 µg/m^3)	Attainment
Sulfur Dioxide (SO_2)	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment
	Annual Arithmetic Mean	Not Applicable	Not Applicable	0.030 ppm (80 µg/m^3)	Attainment [j]
Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	Nonattainment [g]	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	Nonattainment [g]	15 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3 [i]	Nonattainment

[a] California standards for ozone, carbon monoxide (except in the Lake Tahoe air basin), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on average. The Lake Tahoe CO standard is 6.0 ppm, a level one-third the national standard and two-thirds the State standard.

[b] National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially-designed clusters of sites falls below the standard.

[c] National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.

[d] In June 2004, the Bay Area was designated as a marginal nonattainment area for the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e., 75 ppb), effective May 27, 2008.

[e] The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.

[f] In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

Table notes are continued on the following page.

[g] In June 2002, ARB established new annual standards for $PM_{2.5}$ and PM_{10}.
[h] The 8-hour California ozone standard was approved by the ARB on April 28, 2005 and became effective on May 17, 2006.
[i] On January 9, 2013, USEPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. This USEPA rule suspends key SIP requirement as long as monitoring data continues to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until such time as the Air District submits a redesignation request and a maintenance plan to USEPA and USEPA approves the proposed redesignation.
[j] On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 NAAQS , however, must be used until one year following USEPA initial designations of the new 1-hour SO_2 NAAQS.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.
ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter

Source: Bay Area Air Quality Management District, Bay Area Attainment Status, 2015.

The valley lies on a northwest-southeast axis, and the terrain largely shapes winds, resulting in a prevailing flow parallel to the valley's orientation. During the afternoon and early evening a north-northwesterly sea breeze flows through the valley. During the late evening and early morning a light south-southeasterly drainage flow occurs. At times during the summer, air flowing from the Monterey Bay gets channeled northward into the southern end of the valley and meets with the prevailing north-northwesterly winds, creating a "convergence zone."

Wind speeds are highest in the spring and summer and lowest in the fall and winter. Winds tend to be strong in the summer afternoons and evenings, and calm in during all seasons in the nighttime and early morning hours. The occasional winter storm brings strong winds, which are otherwise rare.

The Santa Clara Valley has high air pollution potential. Ozone formation results from a combination of high summer temperatures, stable air, and surrounding mountains. In addition to local sources, ozone precursors are carried by prevailing winds into the valley from San Francisco, San Mateo, and Alameda Counties. Pollutants tend to travel southeast. On summer days with low level inversions, ozone can be recirculated by southerly drainage flows in the late evening and early morning and by the prevailing northwesterlies in the afternoon. Carbon monoxide and particulate matter levels are affected by a similar recirculation pattern in the winter. The impact of pollutants is increased by this movement of the air up and down the valley.

The Santa Clara Valley has a wide and complex variety of pollution sources, including a high concentration of industry in the Silicon Valley at the northern end. Some of these industries are sources of both air toxics and criteria air pollutants. The highest mobile source emissions of any subregion in the SFBAAB are generated in the Santa Clara Valley from the large populations and many work-site destinations.

3. Air Quality Monitoring Results

Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as "attainment" or "nonattainment" depending on whether the regions met the requirements stated in the primary

NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

Pollutant monitoring results for the years 2013 to 2015 at various monitoring sites,[19] shown in Table 5, indicate that air quality in Morgan Hill has been moderate. As indicated in the monitoring results, violations of the State 1-hour ozone standard were recorded once each in 2014 and 2015. The state 8-hour ozone standard was violated once in 2013, five times in 2014, and 4 times in 2015. The federal 8-hour ozone standard was violated once in 2013, three times in 2014, and two times in 2015. No violations were recorded for the federal PM_{10} standard; however, violations of the state PM_{10} standard were recorded five times in 2013, and once each in 2014 and 2015. The annual arithmetic average PM_{10} standard also exceeded the state standard in 2013. Only two violations were recorded for the federal $PM_{2.5}$ standard, both in 2015. No other violations were recorded for the State or Federal CO, NO_2, or SO_2 standards.

4. Greenhouse Gas Emissions Inventory

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of greenhouse gases is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, California, and local greenhouse gas emission inventories.

Global Emissions. Worldwide net emissions (including the effects of land use and forestry) of greenhouse gases in 2010 were 46 billion metric tons[20] of CO_2e per year.[21] This represents a 35 percent increase from 1990.

United States Emissions. In 2012, the United States emitted about 6.5 billion metric tons of CO_2e or about 21 metric tons per year per person. The total 2012 CO_2e emissions represent a 5 percent increase since 1990 but a 10 percent decrease since 2005. Of the six major sectors nationwide – residential, commercial, agricultural, industry, transportation, and electricity generation – electricity generation accounts for the highest amount of greenhouse gas emissions since 1990 (approximately 32 percent), with transportation being a close second at 27 percent since 1990; these emissions are generated entirely from direct fossil fuel combustion.[22]

[19] Nearest monitoring site is the San Martin – Murphy Avenue monitoring site; however, data is unavailable for several pollutants at that site. See Table 5 footnotes for sites used for each pollutant.

[20] A metric ton is equivalent to approximately 1.1 tons.

[21] U.S. Environmental Protection Agency, 2014. *Climate Change Indicators in the United States: Global Greenhouse Gas Emissions.* Website: www.epa.gov/climatechange/science/indicators/ghg/global-ghg-emissions.html.

[22] Ibid.

Table 5: Ambient Air Quality Monitoring at Stations near the City of Morgan Hill

Pollutant	Standard	2013	2014	2015
Carbon Monoxide (CO)[a]				
Maximum 1-hour concentration (ppm)		3	2.4	2.4
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		2.5	1.9	1.8
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)[b]				
Maximum 1-hour concentration (ppm)		0.094	0.097	0.098
Number of days exceeded:	State: > 0.09 ppm	0	1	1
Maximum 8-hour concentration (ppm)		0.076	0.078	0.083
Number of days exceeded:	State: > 0.07 ppm	1	5	4
	Federal: > 0.08 ppm	1	3	2
Coarse Particulates (PM_{10})[a]				
Maximum 24-hour concentration (µg/m^3)		55.8	56.4	58.8
Number of days exceeded:	State: > 50 µg/m^3	5	1	1
	Federal: > 150 µg/m^3	0	0	0
Annual arithmetic average concentration (µg/m^3)		21.6	19.5	21.4
Exceeded for the year:	State: > 20 µg/m^3	Yes	No	Yes
	Federal: > 50 µg/m^3	No	No	No
Fine Particulates ($PM_{2.5}$)[c]				
Maximum 24-hour concentration (µg/m^3)		27.5	25.7	42.2
Number of days exceeded:	Federal: > 35 µg/m^3	0	0	2
Annual arithmetic average concentration (µg/m^3)		8.6	6.9	7.3
Exceeded for the year:	State: > 12 µg/m^3	No	No	No
	Federal: > 12 µg/m^3	No	No	No
Nitrogen Dioxide (NO_2)[a]				
Maximum 1-hour concentration (ppm)		0.059	0.058	0.049
Number of days exceeded:	State: > 0.250 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.015	0.013	0.012
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[a]				
Maximum 1-hour concentration (ppm)		0.003	0.003	0.003
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Maximum 3-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	Federal: > 0.50 ppm	ND	ND	ND
Maximum 24-hour concentration (ppm)		0.001	0.001	0.001
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.0003	.00002	0.0003
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

[a] Data from San Jose – Jackson Street monitoring site
[b] Data from the San Martin – Murphy Avenue monitoring site, unless otherwise noted.
[c] Data from Gilroy – 9th Street monitoring site
ppm = parts per million
µg/m^3 = micrograms per cubic meter
ND = No data. There was insufficient (or no) data to determine the value.

Source: ARB and USEPA, 2016.

State of California Emissions. The ARB is responsible for developing the California Greenhouse Gas Emission Inventory. This inventory estimates the amount of greenhouse gases emitted to and removed from the atmosphere by human activities within the State and supports the AB 32 Climate Change Program.

According to ARB emission inventory estimates, California emitted approximately 460 million metric tons of CO_2e emissions in 2012.[23] California ranks second in the nation in terms of total greenhouse gas emissions (Texas is highest), with a per-capita greenhouse gas emission rate of approximately 12 metric tons per person (43 percent less than the national average in 2012); only 5 other states (all in the northeast) have lower per-capita greenhouse gas emissions.[24]

California greenhouse gas emissions from the transportation sector—still the State's largest single source of greenhouse gases, contributing 36 percent of total emissions—declined modestly compared to 2011; however, over the past 7 years, transportation-related greenhouse gas emissions have dropped 12 percent.[25] The ARB attributes much of this decrease to the growing Statewide fleet of fuel-efficient vehicles—the hybrid vehicle market share increased in 2012 to 7.4 percent from the 2011 level of 5.4 percent.[26]

ARB staff has projected 2020 unregulated greenhouse gas emissions, which represent the emissions that would be expected to occur in the absence of any greenhouse gas reduction actions, would be 507 MMT of CO_2e.[27] The total emissions are lower than originally forecast (596 MMT) in the AB32 Scoping Plan to account for new estimates for future fuel and energy demand and accounting for the recent economic recession.

Greenhouse gas emissions in 2020 from the transportation sector as a whole are expected to increase to 184 MMT of CO_2e (2012 inventory is 167 MMT of CO_2e). The industrial sector consists of large stationary sources of greenhouse gas emissions and includes oil and gas production and refining facilities, cement plants, and large manufacturing facilities. Emissions for this sector are forecast to grow to 91.5 MMT of CO_2e by 2020, an increase of approximately 3 percent from the 2012 emissions inventory level. The commercial and residential sectors are expected to contribute 45.3 MMT of CO_2e, or about 9 percent of the total Statewide greenhouse gas emissions in 2020.[28]

San Francisco Bay Area Emissions. The BAAQMD established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The BAAQMD regularly prepares inventories of criteria and toxic air pollutants to support planning, regulatory and other programs. The most recent emissions inventory estimates greenhouse gas emissions produced by the

[23] California Air Resources Board, 2014. *Greenhouse Gas Inventory Data for 2000–2012*. Website: www.arb.ca.gov/cc/inventory/data/data.htm

[24] California Air Resources Board, 2014. *California Greenhouse Gas Emissions for 2000 to 2012: Trends of Emissions and Other Indicators*. Website: www.arb.ca.gov/cc/inventory/data/data.htm. May 13.

[25] Ibid.

[26] Ibid.

[27] California Air Resources Board, 2013. *Greenhouse Gas Inventory: 2020 Emissions Forecast.* Website: www.arb.ca.gov/cc/inventory/data/forecast.htm.

[28] Ibid.

San Francisco Bay Area in 2011.[29] The inventory, which was published January 2015, updates the previous BAAQMD greenhouse gas emission inventory for base year 2007.

In 2011, 86.6 million metric tons of CO_2e of greenhouse gases were emitted by the San Francisco Bay Area. Fossil fuel consumption in the transportation sector was the single largest source of the San Francisco Bay Area's greenhouse gas emissions in 2011. The transportation sector (including on-road motor vehicles, locomotives, ships and boats, and aircraft) contributed 39.7 percent of greenhouse gas emissions and the industrial and commercial sectors (excluding electricity and agriculture) contributed 35.7 percent of greenhouse gas emissions in the Bay Area. Energy production activities such as electricity generation and co-generation were the third largest contributor with approximately 14 percent of the total greenhouse gas emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 1.5 percent of greenhouse gas emissions.

City of Morgan Hill Emissions. The City of Morgan Hill included a greenhouse gas emissions inventory for 2010 in Appendix B of its *Draft EIR*.[30] The inventory quantifies greenhouse gas emissions from a wide variety of sources and is arranged by sector to facilitate detailed analysis of emissions sources.

As shown in Table 6, the total GHG emissions in 2010 were 174,303 MT CO_2e. The largest percentage of greenhouse gas emissions is from the Energy sector, which includes the Electricity and Natural Gas sectors and accounts for approximately 53.7 percent of total emissions. Transportation contributes the next largest percentage, totaling 32 percent. The Off-road sources, Solid Waste, Wastewater, and Potable Water sectors comprised 9.3 percent, 3.4 percent, 1.1 percent, and 0.5 percent of total emissions, respectively.

Table 6: City of Morgan Hill Greenhouse Gas Emissions by Sector, 2010

Sector	Subsector	Metric Tons CO_2e/year	Percent of Total
Energy		93,635	53.7
Electricity Subtotal		46,751	26.8
	Residential	18,999	10.9
	Commercial	27,753	15.9
Natural Gas Subtotal		46,884	26.9
	Residential	33,025	18.9
	Commercial	13,858	8.0
Transportation		55,820	32.0
Off-Road Sources		16,166	9.3
Solid Waste		5,786	3.4
Wastewater	Wastewater Treatment	1,926	1.1
Potable Water	Water Demand	881	0.5
	Total	**174,303**	**100.0**

Source: Morgan Hill, City of, 2015. *The City of Morgan Hill CAP (Administrative Draft)*. August.

[29] Bay Area Air Quality Management District, 2015. *Source Inventory of Bay Area Greenhouse Gas Emissions.* January.

[30] Morgan Hill, City of, 2015. *The City of CAP (Administrative Draft).* August.

E. METHODOLOGY

Numerous air quality modeling tools are available to assess air quality impacts of projects; however, certain air districts such as the BAAQMD have created guidelines and requirements to conduct air quality analysis. The analysis of air quality impacts for the proposed project followed the BAAQMD *CEQA Air Quality Guidelines*.[31]

In June 2010, BAAQMD adopted updated draft California Environmental Quality Act (CEQA) Air Quality Guidelines and finalized them in May 2011. These guidelines superseded previously adopted agency air quality guidelines of 1999 and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In late 2010, the Building Industry Association filed a lawsuit in Alameda Superior Court, challenging BAAQMD *CEQA Guidelines* on the grounds that the agency did not comply with CEQA. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD *CEQA Air Quality Guidelines*. The court did not determine whether the thresholds of significance were valid on their merits, but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD complied with CEQA. In May of 2012, the BAAQMD filed an appeal of the court's decision. In August of 2013 the First District Court of Appeal overturned the trial court and held that the thresholds of significance were not subject to CEQA review. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review.

On December 21, 2015, the California Supreme Court rejected the BAAQMD's requirement for a so-called reverse CEQA analysis, and concluded that CEQA does not generally require a lead agency to consider the effects of existing environmental conditions on a proposed project's future residents. The Court also noted that assessing the impacts of the environment on the project is not required by CEQA.

In view of the court's order, the BAAQMD is no longer recommending that the thresholds of significance from the 2011 CEQA Air Quality Guidelines be used as a generally applicable measure of a project's significant air quality impacts.[32] Following the court's order, the BAAQMD released revised CEQA Air Quality Guidelines in May of 2012 that include guidance on calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures, and which set aside the significance thresholds. The BAAQMD recognizes that lead agencies may rely on the previously recommended Thresholds of Significance contained in its CEQA Guidelines adopted in 1999.[33]

[31] Bay Area Air Quality Management District, 2011, op. cit.

[32] Bay Area Air Quality Management District, 2014. Website: baaqmd.gov/Divisions/Planning-and-Research/CEQA-Guidelines (accessed May 20, 2015).

[33] Bay Area Air Quality Management District, 1999. *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* December.

The court's invalidation of BAAQMD thresholds presents uncertainty for current project applicants and local agencies regarding proper evaluation of air quality and greenhouse gas emissions in CEQA documents. Although reliance on the 2011 thresholds is no longer required, local agencies still have a duty to evaluate impacts related to air quality and greenhouse gas emissions. In addition, CEQA grants local agencies broad discretion to develop their own thresholds of significance, or to rely on thresholds previously adopted or recommended by other public agencies or experts so long as they are supported by substantial evidence.[34] Accordingly, for purposes of this analysis, LSA is using the BAAQMD 2011 thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These protective thresholds are appropriate in the context of the size, scale, and location of the project.

Construction Emissions, Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. Construction activities are considered temporary; however, short term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline powered equipment, portable auxiliary equipment, and worker commute trips. The RoadMod model was used to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site.

Operational Emissions. The air quality analysis includes estimating emissions associated with long-term operation of the proposed project. Once operational, the retrofitted pipelines would not result in the generation of air emissions beyond the current baseline.

Greenhouse Gas Emissions. Greenhouse gas emissions associated with the project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. Recognizing that the field of global climate change analysis is rapidly evolving, the approaches advocated most recently indicate that lead agencies should calculate, or estimate, emissions from vehicular traffic, energy consumption, water conveyance and treatment, waste generation, construction activities, and any other significant source of emissions within the project area. Once operational, there would not be any long-term operational emissions as a result of the proposed project. Although the BAAQMD does not currently have thresholds of significance for short-term, construction-related GHG emissions, LSA used the RoadMod model to quantify short-term, construction-related greenhouse gas emissions generated by the proposed project for informational purposes.

Local Risks and Hazards. Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter (DPM) are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to DPM. Exposure from diesel exhaust associated with construction activity contributes to both cancer and chronic non-cancer health risks.

[34] Public Resources Code Section 21082: 14 Cal. Code Regs. And Section 15064.7, 15064.4 (addressing greenhouse gas emissions impacts). See also *Citizens for Responsible and Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal.App.4th.327 (upholding City's greenhouse gas emissions threshold based on Assembly Bill 32 compliance).

During construction, various diesel-powered vehicles and equipment would be in use. In 1998, the ARB identified particulate matter from diesel-fueled engines as a TAC. The ARB has completed a risk management process that identifies potential cancer risks for a range of activities using diesel-fueled engines.[35] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (e.g., distribution centers and truck stops) were identified as having the highest associated risk.

Health risks from TACs are a function of both concentration and duration of exposure. Unlike the above types of sources, construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks, whereas health risks are based on a 70-year risk duration. Additionally, construction-related sources are mobile and transient in nature, and the emissions occur within the project site. LSA located the nearest sensitive receptors that would be affected by TAC emissions as a result of project construction and assessed the health risk from TACs at those locations.

F. THRESHOLDS OF SIGNIFICANCE

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The BAAQMD has further defined these criteria of significance to indicate the project would result in a significant air quality impact if it would:

- Violate the Bay Area Air Quality Management District's air quality standards or contribute substantially to an existing or projected air quality violation by:
    - Generating average daily criteria air pollutant emissions of ROG, NO_x or $PM_{2.5}$ exhaust emissions in excess of 54 pounds per day or PM_{10} exhaust emissions of 82 pounds per day during project construction;
    - For project operations, generating average daily criteria air pollutant emissions of ROG, NO_x, or $PM_{2.5}$ in excess of 54 pounds per day, or maximum annual emissions of 10 tons per year. For emissions of PM_{10}, generating average daily emissions of 82 pounds per day or 15 tons per year; or

[35] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

- Contributing to CO concentrations exceeding the State ambient air quality standards of 9 ppm averaged over 8 hours and 20 ppm for 1-hour for project operations.

- Expose sensitive receptors (including residential areas) or the general public to toxic air contaminants in excess of the following thresholds:
  - An excess cancer risk level of more than 10 in one million, or non-cancer (i.e., chronic or acute) risk greater than 1.0 hazard index from a single source;
  - An incremental increase of greater than 0.3 $\mu g/m^3$ annual average $PM_{2.5}$ from a single source;
  - An excess cancer risk level of more than 100 in one million, or non-cancer risk greater than 100 in one million from all sources; or
  - An incremental increase of greater than 0.8 $\mu g/m^3$ annual average $PM_{2.5}$ from all sources.

It should be noted that the emission thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse greenhouse gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

The BAAQMD does not have established GHG thresholds for construction-related emissions. The BAAQMD has further defined these criteria of significance to indicate the project would result in a less-than-significant air quality impact if it would:

- Result in operational-related greenhouse gas emissions of less than 1,100 metric tons of CO_2e a year, or
- Result in operational-related greenhouse gas emissions of less than 4.6 metric tons of CO_2e per service population (residents plus employees).

The thresholds of significance for odor impacts are qualitative in nature. A project that would result in the siting of a new source or the exposure of a new receptor to existing or planned odor sources should consider the screening level distances and the complaint history of the odor sources.

G. IMPACTS AND MITIGATION MEASURES

The project would affect air quality during construction. This section identifies the air quality impacts associated with implementation of the proposed project. Mitigation measures are recommended, as appropriate, for significant impacts to eliminate or reduce them to a less-than-significant level. This section also identifies impacts that are considered to be less-than-significant. LSA analyzed the impacts of both alignment options. Because the construction activities and existing conditions of both alignment options are essentially identical, the results represent of summary of both alignment options.

1. Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by demolition, excavation and filling, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and TACs such as diesel exhaust particulate matter.

The project would involve demolition, excavation and fill, grading, paving, and building activities. Construction-related effects on air quality from the proposed project would be greatest during the excavation, pipeline demolition, and paving phases because most engine emissions are associated with the excavation, handling, and transport of soils and paving materials on the site. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. These emissions would be temporary and limited to the immediate area around the project site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The BAAQMD has established standard measures for reducing fugitive dust emissions (PM_{10}). With the implementation of these Best Management Practice measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Construction emissions associated with the proposed project were calculated using RoadMod, which includes emission factors from the CARB EMFAC2011 and OFFROAD2011. LSA used specific construction details provided by the Santa Clara Valley Water District when available and default RoadMod assumptions for all other input fields. The construction schedule for all improvements is expected to be approximately 17 months, starting in 2017. Construction-related emissions are presented in Table 7. RoadMod output details are included in Appendix A.

Table 7: Project Construction Emissions in Average Pounds Per Day

Project Construction	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Average Daily Emissions	3.1	32.5	40.4	0.4
BAAQMD Thresholds	54.0	54.0	82.0	54.0
Exceed Threshold?	No	No	No	No

Source: LSA Associates Inc., May 2016.

As shown in Table 5, construction emissions associated with the project would be less than significant for ROG, NO_x and $PM_{2.5}$ and PM_{10} exhaust emissions. The BAAQMD requires the implementation of Best Management Practices to reduce construction dust impacts to a less-than-significant level as follows:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact at the Santa Clara Valley Water District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

2. Operational Air Quality Impacts

Long-term air emission impacts are those associated with area sources and mobile sources involving any change related to the proposed project. Once operational, the retrofitted pipelines would not result in the generation of air emissions beyond the current baseline. Therefore, the proposed project would not have a significant effect on regional air quality and mitigation would not be required.

3. Localized CO Impacts

The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD *CEQA Guidelines*, a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, and the regional transportation plan and local congestion management agency plans.

- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, or below-grade roadway).

Implementation of the proposed project would not conflict with the Santa Clara Valley Transportation Authority Congestion Management Program for designated roads or highways, a regional transportation plan, or other agency plans. The proposed project would not generate any additional vehicle trips once operational. Therefore, the proposed project would not result in localized CO concentrations that exceed State or federal standards.

4. Exposure of Sensitive Receptors to Toxic Air Contaminants

Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter (DPM) are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to DPM. Exposure from diesel exhaust associated with construction activity could contribute to both cancer and chronic non-cancer health risks.

During construction, various diesel-powered vehicles and equipment would be in use. In 1998, the ARB identified particulate matter from diesel-fueled engines as a TAC. The ARB has completed a risk management process that identifies potential cancer risks for a range of activities using diesel-fueled engines.[36] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (e.g., distribution centers and truck stops) were identified as having the highest associated risk.

Health risks from TACs are a function of both concentration and duration of exposure. Unlike the above types of sources, construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks, whereas health risks are based on a 70-year risk duration. Additionally, construction-related sources are mobile and transient in nature, and the emissions occur within the project site.

[36] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

The nearest sensitive receptors include residences located approximately 40 feet from the construction area and Live Oak High School, with buildings located approximately 1,000 feet southeast of the construction area along Half Road.

Given the short duration of project construction, and due to the linear nature of the project construction site, construction duration would be limited at any one receptor location. Construction of the project would be expected to occur for a duration of 17 months which is short relative to the 70 year health risk exposure analysis period, especially given that each receptor would only be exposed to a small fraction of the construction duration.

In addition, as shown in Table 7, project construction PM_{10} exhaust emissions (the primary source of construction TAC emissions) would be 0.7 pounds per day which is well below the BAAQMD threshold for PM_{10} exhaust emissions. Implementation of the BAAQMD-required construction best management practices would further reduce health risks from construction emissions of diesel particulate by limiting the amount of idling that would occur. Therefore, health risks associated with construction of the proposed project would be less than significant.

LSA also used the BAAQMD Stationary Source Screening Analysis Tool to identify stationary sources and associated estimated risk and hazard impacts in the project vicinity. The screening analysis identified one source within 1,000 feet of the project construction areas. Hoo Gee nursery is located directly adjacent to Cochrane Road, just east of Half Road, and would result in a cancer risk of 0.02 in one million, a hazard index of 0.000, and $PM_{2.5}$ concentration of 0.064 $\mu g/m^3$. The TAC emissions are well below the BAAQMD thresholds of 10 in one million, 1.0 hazard index, and 0.3 $\mu g/m^3$, respectively, therefore a cumulative impact would not occur. Therefore, TAC impacts from this stationary source would be less than significant.

Project excavation activities would result in ground disturbance in areas that may contain naturally occurring asbestos (NOA). The *Geotechnical Investigation Report*[39] performed for the project did not identify any serpentine aggregate samples, and based on the California Department of Conservation's *General Location Guide for Ultramafic Rocks in California*,[40] the proposed project does not appear to be located in an area likely to contain naturally occurring asbestos.

The proposed project includes the demolition of the existing chemical feed station along Cochrane Road, which would be required to comply with BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). Regulation 11, Rule 2 is intended to limit asbestos emissions from demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities and requires the SCVWD and its contractors to notify BAAQMD of any regulated renovation or demolition activity. This notification includes a description of structures and methods utilized to determine whether asbestos-containing materials are potentially present. All asbestos-containing material found on the site must be removed prior to demolition or renovation activity in accordance with Regulation 11, Rule 2,

[39] Parikh Consultants, Inc., 2016. *Geotechnical Investigation Report Main Avenue and Madrone Pipelines Restoration Project.* April.

[40] California Department of Conservation, Division of Mines and Geology, 2000. *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos.* August.

including specific requirements for surveying, notification, removal, and disposal of material containing asbestos. Therefore, as the proposed project would comply with Regulation 11, Rule 2, any asbestos-containing materials would be disposed of appropriately and safely, and impacts would be less than significant.

5. Consistency with Existing Air Quality Plans

The applicable air quality plan is the BAAQMD 2010 Clean Air Plan, which was adopted on September 15, 2010. The Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defines a control strategy to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions to protect the climate. Consistency with the Clean Air Plan can be determined if the project does the following: 1) supports the goals of the Clean Air Plan; 2) includes applicable control measures from the Clean Air Plan; and 3) would not disrupt or hinder implementation of any control measures from the Clean Air Plan.

Transportation and Mobile Source Control Measures. The BAAQMD identifies control measures as part of the Clean Air Plan to reduce ozone precursor emissions from stationary, area, mobile, and transportation sources. The Transportation Control Measures are designed to reduce emissions from motor vehicles by reducing vehicle trips and vehicle miles traveled (VMT) in addition to vehicle idling and traffic congestion. The proposed project would not conflict with the identified Transportation and Mobile Source Control Measures of the Clean Air Plan, as the project would not result in increased operational VMT. The project would repair and replace portions of the Main Avenue and Madrone pipelines. Therefore, other transportation and mobile source control measures from the Clean Air Plan are not applicable to this project.

Land Use and Local Impact Measures. The Clean Air Plan includes Land Use and Local Impacts Measures (LUMs) to achieve the following: promote mixed-use, compact development to reduce motor vehicle travel and emissions; and ensure that planned growth is focused in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. The LUMs identified by the BAAQMD are not applicable to the proposed project.

Energy Measures. The Clean Air Plan also includes Energy and Climate Control Measures, which are designed to reduce ambient concentrations of criteria pollutants and reduce emissions of CO_2. Implementation of these measures is intended to promote energy conservation and efficiency in buildings throughout the community, promote renewable forms of energy production, reduce the "urban heat island" effect by increasing reflectivity of roofs and parking lots, and promote the planting of (low-VOC-emitting) trees to reduce biogenic emissions, lower air temperatures, provide shade, and absorb air pollutants. The measures include voluntary approaches to reduce the heat island effect by increasing shading in urban and suburban areas through the planting of trees. The energy measures of the Clean Air Plan are not applicable to the proposed project.

As discussed above, implementation of the proposed project would not disrupt or hinder implementation of the applicable measures outlined in the Clean Air Plan, including Transportation and Mobile Source Control Measures, Land Use and Local Impact Measures, and Energy Measures.

6. Cumulative Impact Assessment

CEQA defines a cumulative impact as two or more individual effects, which when considered together, are considerable or which compound or increase other environmental impacts. According to the BAAQMD, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself; result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Therefore, if daily average or annual emissions of operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a cumulatively significant impact.

As discussed above, implementation of the proposed project would generate less than significant operational emissions. As shown in the project-specific air quality impacts discussion above, the proposed project would not result in individually significant impacts and therefore would also not make a cumulatively considerable contribution to regional air quality impacts.

7. Greenhouse Gas Analysis

This section discusses the project's impacts related to the release of greenhouse gas emissions for both construction and project operation.

Construction Activities. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction.

Using RoadMod, it is estimated that the project would generate approximately 1,021 metric tons of CO_2 during the 17-month construction period. Implementation of the BAAQMD Best Management Practices construction emission control measures would further reduce GHG emissions during the construction period. Therefore, GHG emissions during construction would be less than significant.

Operational GHG Emissions. The proposed project would not be expected to generate operational GHG emissions once construction is complete.

The County of Santa Clara prepared a Climate Action Plan[41] (CAP) to reduce GHG emissions consistent with the requirements of AB32. The CAP includes GHG reduction strategy measures to reduce countywide emissions. However, most of the measures identified in the CAP include measures that would be implemented by development projects or specific actions that would be undertaken by

[41] Santa Clara, County of, 2009. *Climate Action Plan for Operations and Facilities.* September.

the County to reduce GHG emissions. The proposed project would replace and repair a pipeline and therefore, the GHG reduction measures are not applicable to the project. The project would not hinder the implementation of any of the measures.

The proposed project would not have a significant effect on the environment related to greenhouse gas emissions.

8. Odors

Once operational, the project does not include any activities or operations that would generate objectionable odors. During the short-term construction period, odors may occur related to decaying organic material disturbed during the excavation and construction process which would occur over a period of 17 months. These odors are expected to be minimal at any one receptor location, short-term, and dispersed over a wide area. Therefore, the project would not create objectionable odors affecting a substantial number of people and impacts would be less than significant.

APPENDIX A

ROADMOD DATA

Road Construction Emissions Model, Version 7.1.5.1

Emission Estimates for -> Main Avenue and Madrone Pipeline Restoration Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	1.6	11.8	18.0	10.8	0.8	10.0	2.8	0.7	2.1	2,561.2
Grading/Excavation	6.7	35.3	73.2	13.5	3.5	10.0	5.2	3.1	2.1	9,588.2
Drainage/Utilities/Sub-Grade	3.7	18.7	33.4	11.8	1.8	10.0	3.7	1.6	2.1	4,465.9
Paving	1.6	12.4	14.0	0.9	0.9	-	0.8	0.8	-	2,435.5
Maximum (pounds/day)	6.7	35.3	73.2	13.5	3.5	10.0	5.2	3.1	2.1	9,588.2
Total (tons/construction project)	0.8	4.4	8.4	2.0	0.4	1.6	0.7	0.4	0.3	1,125.7

Notes:

Project Start Year ->	2017
Project Length (months) ->	17
Total Project Area (acres) ->	14
Maximum Area Disturbed/Day (acres) ->	1
Total Soil Imported/Exported (yd^3/day)->	192

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Main Avenue and Madrone Pipeline Restoration Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	0.7	5.4	8.2	4.9	0.4	4.5	1.3	0.3	0.9	1,164.2
Grading/Excavation	3.1	16.0	33.3	6.1	1.6	4.5	2.3	1.4	0.9	4,358.3
Drainage/Utilities/Sub-Grade	1.7	8.5	15.2	5.4	0.8	4.5	1.7	0.7	0.9	2,029.9
Paving	0.7	5.7	6.4	0.4	0.4	-	0.4	0.4	-	1,107.0
Maximum (kilograms/day)	3.1	16.0	33.3	6.1	1.6	4.5	2.3	1.4	0.9	4,358.3
Total (megagrams/construction project)	0.7	4.0	7.6	1.8	0.4	1.4	0.6	0.3	0.3	1,021.0

Notes:

Project Start Year ->	2017
Project Length (months) ->	17
Total Project Area (hectares) ->	6
Maximum Area Disturbed/Day (hectares) ->	0
Total Soil Imported/Exported (meters^3/day)->	147

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model

Version 7.1.5.1

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type		
Project Name	Main Avenue and Madrone Pipeline Restoration	
Construction Start Year	2017	Enter a Year between 2009 and 2025 (inclusive)
Project Type	2	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	17.00	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	2.65	miles
Total Project Area	14.14	acres
Maximum Area Disturbed/Day	1.00	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	96.00	yd^3/day
Soil Exported	96.00	yd^3/day
Average Truck Capacity	12	yd^3 (assume 20 if unknown)

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		1.70
Grading/Excavation		6.80
Drainage/Utilities/Sub-Grade		5.95
Paving		2.55
Totals	0.00	17.00

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip		30
Round trips/day		16
Vehicle miles traveled/day (calculated)		480

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.15	7.86	0.69	0.17	0.09	1747.20
Tons per contruction period	0.01	0.59	0.05	0.01	0.01	130.69

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip		20
One-way trips/day		2
No. of employees: Grubbing/Land Clearing		11
No. of employees: Grading/Excavation	25.00	26
No. of employees: Drainage/Utilities/Sub-Grade		20
No. of employees: Paving		16

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765
Emission rate - Grading/Excavation (grams/mile)	0.133	0.172	1.555	0.047	0.020	443.765
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.127	0.165	1.491	0.047	0.020	443.813
Emission rate - Paving (grams/mile)	0.120	0.154	1.399	0.047	0.020	443.880
Emission rate - Grubbing/Land Clearing (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644
Emission rate - Grading/Excavation (grams/trip)	0.457	0.287	3.779	0.004	0.003	95.644
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.440	0.274	3.627	0.004	0.003	95.672
Emission rate - Paving (grams/trip)	0.415	0.255	3.410	0.004	0.003	95.711
Pounds per day - Grubbing/Land Clearing	0.154	0.185	1.729	0.047	0.020	444.596
Tons per const. Period - Grub/Land Clear	0.003	0.003	0.032	0.001	0.000	8.314
Pounds per day - Grading/Excavation	0.342	0.411	3.842	0.104	0.044	987.990
Tons per const. Period - Grading/Excavation	0.026	0.031	0.287	0.008	0.003	73.902
Pounds per day - Drainage/Utilities/Sub-Grade	0.263	0.315	2.946	0.083	0.035	790.478
Tons per const. Period - Drain/Util/Sub-Grade	0.017	0.021	0.193	0.005	0.002	51.737
Pounds per day - Paving	0.202	0.239	2.247	0.067	0.028	642.363
Tons per const. Period - Paving	0.006	0.007	0.063	0.002	0.001	18.018
tons per construction period	0.051	0.062	0.576	0.016	0.007	151.971

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust		1		40
Grading/Excavation - Exhaust		1		40
Drainage/Utilities/Subgrade		1		40

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate - Grading/Excavation (grams/mile)	0.15	7.43	0.65	0.16	0.09	1652.56
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.15	7.11	0.66	0.16	0.09	1641.05
Pounds per day - Grubbing/Land Clearing	0.01	0.65	0.06	0.01	0.01	145.60
Tons per const. Period - Grub/Land Clear	0.00	0.01	0.00	0.00	0.00	2.72
Pound per day - Grading/Excavation	0.01	0.65	0.06	0.01	0.01	145.60
Tons per const. Period - Grading/Excavation	0.00	0.05	0.00	0.00	0.00	10.89
Pound per day - Drainage/Utilities/Subgrade	0.01	0.63	0.06	0.01	0.01	144.59
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.04	0.00	0.00	0.00	9.46

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		1	10.0	0.2	2.1	0.0
Fugitive Dust - Grading/Excavation		1	10.0	0.7	2.1	0.2
Fugitive Dust - Drainage/Utilities/Subgrade		1	10.0	0.7	2.1	0.1

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Crawler Tractors	0.71	4.47	9.06	0.35	0.32	825.49
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	2	Excavators	0.76	5.58	8.10	0.40	0.37	1145.50
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	1.5	10.0	17.2	0.7	0.7	1971.0
	Grubbing/Land Clearing	tons per phase	0.0	0.2	0.3	0.0	0.0	36.9

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.00	3	Excavators	0.38	2.79	4.05	0.20	0.18	572.75
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Graders	1.00	3.47	9.64	0.54	0.50	669.23
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Off-Highway Trucks	0.92	4.29	9.88	0.37	0.34	1417.26
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
3.00		Other Material Handling Equipment	1.56	9.52	15.66	0.83	0.76	1825.79
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Rollers	0.32	1.51	2.88	0.21	0.19	279.45
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Rubber Tired Dozers	1.23	4.42	13.05	0.61	0.56	944.66
	1	Rubber Tired Loaders	0.50	3.12	6.05	0.21	0.19	662.79
0.00	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00	4	Tractors/Loaders/Backhoes	0.33	1.57	3.06	0.23	0.21	335.52
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	6.2	30.7	64.3	3.2	2.9	6707.4
	Grading	tons per phase	0.5	2.3	4.8	0.2	0.2	501.7

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Air Compressors	0.61	3.40	4.02	0.32	0.29	507.95
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Cranes	0.64	3.01	7.23	0.32	0.29	601.82
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.95	3.47	9.09	0.51	0.47	668.47
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Off-Highway Trucks	0.87	4.29	9.24	0.34	0.31	1417.24
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00	3	Tractors/Loaders/Backhoes	0.31	1.57	2.89	0.21	0.20	335.32
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	3.4	15.7	32.5	1.7	1.6	3530.8
	Drainage	tons per phase	0.2	1.0	2.1	0.1	0.1	231.1

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1	Pavers	0.33	2.84	3.45	0.17	0.16	482.19
1.00	1	Paving Equipment	0.24	2.69	2.59	0.13	0.12	426.37
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Rollers	0.27	1.51	2.48	0.17	0.16	279.43
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	6	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Sweepers/Scrubbers	0.32	1.57	2.64	0.22	0.20	270.09
1.00	3	Tractors/Loaders/Backhoes	0.28	1.57	2.64	0.19	0.17	335.03
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	1.4	10.2	13.8	0.9	0.8	1793.1
	Paving	tons per phase	0.0	0.3	0.4	0.0	0.0	50.3
Total Emissions all Phases (tons per construction period) =>			0.8	3.8	7.6	0.4	0.4	820.0

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps		53		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

APPENDIX B
Biological Resources Report

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Main Avenue and Madrone Pipelines Restoration Project

Biological Resources Report

Project #3700-13

Prepared for:

Don Arnold
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Prepared by:

H. T. Harvey & Associates

October 27, 2016

983 University Avenue, Building D • Los Gatos, CA 95032 • Ph: 408.458.3200 • F: 408.458.3210

Table of Contents

1 Introduction

This report presents the baseline regulatory and environmental setting, as related to biological resources, for the Santa Clara Valley Water District's (District's) proposed Main Avenue and Madrone Pipelines Restoration Project located in the City of Morgan Hill in Santa Clara County California (Figure 1 in Attachment A). The Project entails replacement of portions of the Main Avenue and Madrone Pipelines with larger pipelines to restore their full operational capacity and to convey adequate flows to meet future subbasin recharge requirements. The proposed Project would be implemented along three major segments (Segments 1, 2, and 3) (Figure 2 in Attachment A) as described below:

- Segment 1 is composed of the 2,800 linear feet (lf) of 16-inch diameter Main Avenue Pipeline from the Anderson Reservoir outlet to the Cochrane and Half Road intersection. Pipeline for Segment 1 will be replaced with 36-inch pipe.

- Segment 2 is composed of the remaining 4,860 lf of 16-inch, 18-inch, and 24-inch diameter Main Avenue Pipeline from the Cochrane and Half Road intersection to the Main Avenue Ponds. Pipeline for Segment 3 will be replaced with 30-inch pipe.

- Segment 3 is composed of the 6,300 lf of 24-inch diameter and 30-inch diameter Madrone Pipeline from the Cochrane and Half Road intersection to the Madrone Channel. Pipeline for Segment 2 will be replaced with 30-inch pipe.

In addition to the replacement of pipes, an underground utility vault will be constructed at the end of each of the two pipelines. An existing chemical feed station will be demolished and reconstructed north of Main Avenue near the Main Avenue turnout.

During Project construction, the District will incorporate a range of best management practices (BMPs) to avoid and minimize undesired effects on the environment. BMPs are generally used by the District for construction projects and have been customized for the proposed Project, as necessary, to ensure that the intended goal of each measure is achieved. BMPs are designed to address anticipated effects of certain work activities on particular types of resources. The BMPs that have been incorporated into the Project are included as Attachment B.

Methods

To identify existing biological conditions on the Project site, a number of information sources were reviewed by H. T. Harvey & Associates ecologists prior to conducting fieldwork, including the following:

- Aerial images (Google Inc. 2016), U.S. Geological Survey (USGS) topographic maps, National Resource Conservation Service (NRCS) soil survey data (NRCS 2016), and the National Wetland Inventory (NWI 2016)

- The Santa Clara Valley Habitat Conservation Plan (VHP) (ICF International 2012), particularly Chapters 2 (Land Use and Covered Activities) and 3 (Physical and Biological Resources), and the species accounts in Attachment E

- Data on special-status animal species occurrences, including resource agency data, California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB 2016), the Breeding Bird Atlas of Santa Clara County (Bousman 2007a), California Bird Species of Special Concern (Shuford and Gardali 2008), and unpublished bird records maintained by Santa Clara County records-keeper William G. Bousman

- Data on special-status plant species occurrences, including the current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 and 4 lists (CNPS 2016) and the CNDDB (2016)

H. T. Harvey & Associates senior ecologist Robin Carle, M.S., conducted a reconnaissance-level survey of the Project site on February 26, 2016. The purpose of the survey was to identify existing biological conditions on the site and the site's potential to support special-status species of plants and animals, as well as sensitive/regulated habitats such as jurisdictional wetlands and other waters of the U.S. regulated under Section 404 of the Clean Water Act, potential waters of the State, and riparian habitats. The survey included an assessment of habitats for special-status species both on the site and in adjacent areas that could be impacted either directly or indirectly by proposed activities, as well as an assessment of adjacent habitats that could potentially support source populations of sensitive species that could disperse onto the Project site.

Because the proposed Project is a "covered project" under the approved VHP (ICF International 2012), land cover types were mapped based on VHP mapping with modifications based upon site conditions observed during the field survey. Further, because the VHP requires the payment of fees for impacts that occur within the Project footprint as well as a 50-foot (ft) buffer around permanent impacts and 10-ft buffer around temporary impacts, the Project boundary was expanded to include these buffers where applicable[1] (Figure 2 in Attachment A).

The Project is located within 250 ft of an area (i.e., the Main Avenue Ponds) mapped by the VHP as suitable nesting habitat for the tricolored blackbird. Therefore, per Condition 17 of the VHP, H. T. Harvey & Associates wildlife ecologist and ornithologist Robin Carle, M.S., conducted a field investigation to identify and map potential nesting substrate for tricolored blackbirds on February 26, 2016.

A focused survey for Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*, CRPR 1B.1) was conducted by Steve Rottenborn, Ph.D. on August 2, 2016. Dr. Rottenborn conducted a focused survey for Congdon's tarplant on portions of the proposed Project site that supports suitable

[1] The VHP does not require the assessment of permanent or temporary impact buffers for linear projects or for lands mapped as "urban-suburban", "landfill", "reservoir", or "agricultural developed". Thus, for the proposed Project, temporary impact buffers were included only around the staging areas, and permanent impact buffers were included only around impacts resulting from construction of non-linear Project components (e.g., construction of the chemical feed station, and pressure regulating valve assembly) that would occur in a non-urban-suburban land cover type.

habitat for this plant. Congdon's tarplant blooms from May to October, and prior to surveying the site, Dr. Rottenborn visited a known reference population of Congdon's tarplant at Moffett Federal Airfield in Mountain View on July 29 to ensure that detection and positive identification of this taxon would be possible. During that reference site visit, the Congdon's tarplant population was in full bloom, and the plants were positively identified to subspecies. Thus, the Congdon's tarplant survey on the Project site was conducted at an appropriate time for detection of this taxon.

2 Regulatory Setting

Biological resources on the Project site are protected by numerous federal and state regulations, including the Clean Water Act, Federal Endangered Species Act (FESA), Migratory Bird Treaty Act (MBTA), California Endangered Species Act (CESA), Native Plant Protection Act, and California Fish and Game Code. Regulations for biological resources are also established at the local level by the VHP, City of Morgan Hill, and County of Santa Clara. For additional information, see Attachment C of this report.

3 Environmental Setting

Whereas the animal species present in any given community are largely determined by the plant assemblages present, the plant species present are generally a response to abiotic (non-living) factors such as climate, topography, and soils. Thus, the climate and soils at the Project site are discussed herein, as well as the natural communities and special-status species present.

Climate and Soils

The Project site is located in the City of Morgan Hill and unincorporated portions of Santa Clara County, California (Figure 1 in Attachment A). The site is located in the *Morgan Hill, California* and *Mount Sizer, California* USGS 7.5-minute quadrangles. The site is located in Sections 15 and 16 of Township 9 South, Range 3 East. The annual temperature in the region ranges from a low of 47.0 degrees Fahrenheit (ºF) to a high of 72.5 ºF, and annual precipitation is approximately 21.2 inches (PRISM Climate Group 2013). Elevations on the site range from approximately 369 ft at the Madrone Channel to 476 ft along Cochrane Road near Anderson Dam.

Ten soil mapping units are found on the Project site, as listed in Table 1. The Project site is dominated by Pleasanton loam, 0 to 2 percent slopes, which is a sandy loam soil complex. No soils on the Project site are described as serpentinite derived (NRCS 2016), and no portions of the site are mapped as serpentine fee areas according to VHP data (ICF International 2012).

Table 1. Soil Types on the Project Site

Soil Series Code	Soil Name
ArA	Arbuckle gravelly loam, 0 to 2 percent slopes
GaA	Garretson loam, gravel substratum, 0 to 2 percent slopes
GbB	Garretson gravelly loam, 0 to 5 percent slopes
GoF	Gilroy clay loam, 30 to 50 percent slopes
KeC2	Keefers clay loam, 2 to 9 percent slopes, eroded
LrC	Los Robles clay loam, 2 to 9 percent slopes
McB	Maxwell clay, 0 to 5 percent slopes
PoA	Pleasanton loam, 0 to 2 percent slopes
PpA	Pleasanton gravelly loam, 0 to 2 percent slopes
SdA	San Ysidro loam, 0 to 2 percent slopes

Source: NRCS 2016.

Existing Land Uses, Natural Communities, and Habitats

As described above, habitat and land cover types are based upon VHP (ICF International 2012) mapping with modifications based upon site conditions observed during the 2016 field survey. Three biotic habitats and land uses were identified on the Project site: grain, row-crop, hay and pasture, disked/short-term fallowed; urban-suburban; and pond (see Figure 2 in Attachment A; Table 2). On the Project site, the only aquatic features consist of the Main Avenue Ponds and the Madrone Channel. The dominant and characteristic plant and animal species for each of these habitats/land cover types are described below.

Table 2. Summary of Existing Land Cover Types on the Project Site

Existing Land Cover Types	Approximate Area (acres)
Grain, row-crop, hay and pasture, disked/short-term fallowed	1.13
Urban-suburban	8.11
Pond	0.19
Total	**9.43**

Grain, Row-crop, Hay and Pasture, Disked/Short-term Fallowed

The grain, row-crop, hay and pasture, and disked/short-term fallowed land cover type is included under the “agriculture developed” natural community in the VHP. It encompasses irrigated and

non-irrigated areas of tilled land that alternately are planted with row-crops or grains or are fallow. Non-native forbs and grasses (i.e. ruderal plant species) may begin to colonize areas that have been left as fallow during the growing season or remain barren for successive years.

Agricultural areas of the Project site provide habitat for wildlife species similar to surrounding nonnative grassland habitats in the region, except that agricultural habitats are highly cultivated for specific species and regularly disturbed by farming activities. Small mammals such as Botta's pocket gophers (*Thomomys bottae*), California ground squirrels (*Spermophilus beecheyi*), and California mice (*Peromyscus californicus*) breed and forage in these fields, especially where the ground has not been recently disturbed and they can establish burrow complexes. These small mammals provide prey for red-tailed hawks (*Buteo jamaicensis*), barn owls (*Tyto alba*), grey foxes (*Urocyon cinereoargenteus*), gopher snakes (*Pituophis catenifer*), northern Pacific rattlesnakes (*Crotalus oreganus*), and other predators. Birds such as Canada geese (*Branta canadensis*), finches, sparrows, and blackbirds will forage on seeds in these fields, and red-winged blackbirds (*Agelaius phoeniceus*) may breed in fallow fields. However, the repeated disturbance causes these communities to change frequently, and the animal communities present will depend upon the management of individual fields.

Urban-Suburban

The urban-suburban land cover type is included under the "developed" natural community in the VHP. It encompasses areas where the majority of naturally occurring vegetation has been cleared for commercial, industrial, transportation, or recreational structures; in addition to associated paved and impermeable surfaces. The urban-suburban land cover type on the Project site includes paved, dirt, and gravel roads. These areas may support a very low cover of non-native, ruderal vegetation, similar to that which occurs within adjacent rural residential; grain, row-crop, hay and pasture, and disked/short-term fallowed; and orchard land cover types.

Paved, dirt, and gravel roads do not provide high-quality wildlife habitat; however, snakes and lizards may bask on these surfaces and a wide variety of wildlife cross or move along these roads en route to other habitats.

Pond

The five Main Avenue Ponds are located southwest of the corner of East Main Avenue and Hill Road. These man-made ponds are used by the District for groundwater recharge purposes, and the District can raise and lower water levels within the ponds. At times the ponds are drained dry or to very low levels for maintenance purposes. The District releases water into these ponds annually to recharge the groundwater basin. Because of this, the ponds typically provide relatively deep (over 4 ft, with the capacity for ponding up to 12 ft) perennial aquatic habitat. The ponds are periodically dry-cycled to reduce biomass. The banks are relatively steep-sided and are poorly vegetated, being mostly bare earth and gravel.

The Main Avenue Ponds are mapped as ponds by the VHP (ICF International 2012) and fall under the open water natural community. Although some emergent vegetation, such as tall flatsedge

(*Cyperus eragrostis*), and submerged aquatic vegetation is present at and below the ordinary high water mark of the ponds, due to the limited extent of this vegetation (less than 0.01 acre [ac]) these vegetated areas were included within the pond land cover type.

The Main Avenue Ponds support several species of aquatic invertebrates such as backswimmers (Notonectidae), mayfly nymphs (Ephemeroptera), dragonfly nymphs (Anisoptera), ramshorn snails (*Planobarius* spp.), and Belostomatid beetles (H. T. Harvey & Associates 2014). Common amphibians including Sierran chorus frogs (*Pseudacris sierrae*) and western toads (*Anaxyrus boreas*) breed in these ponds, and fish present include the prickly sculpin (*Cottus asper*) and inland silverside (*Menidia beryllina*) (H. T. Harvey & Associates 2014). In addition, some emergent vegetation is present to provide nesting and foraging habitat for birds such as the marsh wren (*Cistothorus palustris*) and song sparrow (*Melospiza melodia*). The open water at the ponds provides foraging habitat for several species of ducks including the mallard (*Anas platyrhynchos*) and bufflehead (*Bucephala albeola*).

Although the Madrone Channel is mapped as the urban-suburban land cover type by the VHP (ICF International 2012), the minimum mapping unit used in all developed land cover types by the VHP was 10 ac, a relatively coarse scale. Therefore, we mapped the Madrone Channel as a pond feature in conformance with VHP land cover type definitions, as it is excavated and functions similarly to a percolation pond with a linear shape. This man-made channel is used by the District for groundwater recharge purposes, and the District can raise and lower water levels within this channel, and within individual segments of the channel, and at times these segments are drained dry or to very low levels for maintenance purposes. The Madrone Channel is generally devoid of vegetation; however, non-native, ruderal plant species are present above the ordinary high water marks.

The section of the Madrone Channel that occurs on the Project site provides suitable habitat for aquatic wildlife species when it contains water. However, water in this channel is drawn down or refilled periodically by the District for groundwater recharge purposes. When water is present, the aquatic habitat in this channel may provide functions and values for aquatic wildlife, including aquatic invertebrates such as backswimmers, aquatic beetles, mayfly nymphs, dragonfly nymphs, leeches (subclass Hirudinea), and aquatic snails, as well as amphibians, such as the Sierran chorus frog, and fish. If water is allowed to remain in the channel for several months, amphibians such as the Sierran chorus frog and western toad may breed there.

Special-Status Plant and Animal Species

For the purpose of the environmental review of the Project, special-status species have been defined as described below. Impacts on these species are regulated by some of the federal, state, and local laws and ordinances described in “Regulatory Setting” (see Attachment C).

Special-Status Plants

For purposes of this analysis, “special-status” plants are considered plant species that are:

- listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species;

- listed under CESA as threatened, endangered, rare, or a candidate species; or

- ranked by the CNPS as rare or endangered in Ranks 1A, 1B, 2A, 2B, 3, or 4.

We reviewed all species on current CNPS CRPR 1A, 1B, 2A, and 2B lists occurring in the *Morgan Hill, California* USGS quadrangle and surrounding eight quadrangles (*San Jose East*, *Lick Observatory*, *Isabel Valley*, *Santa Teresa Hills*, *Mount Sizer*, *Loma Prieta*, *Mount Madonna*, and *Gilroy*). In addition, we queried the CNDDB (2016) for any additional CRPR Rank 3 and 4 species detected within 5 miles (mi) of the site, as these species do not always have quadrangle-level records. We also queried CNDDB (2016) for natural communities of special concern that occur within the Project region.

A list of 60 special-status plants thought to have some potential for occurrence in the Morgan Hill area was compiled and reviewed for each species' potential to occur on the Project site. A CNDDB (2016) map of known special-status plant species occurrences in the proposed Project vicinity (defined as the area within a 5-mi radius of the Project site) is provided as Figure 3 in Attachment A. Analysis of the documented habitat requirements and occurrence records associated with all of the species considered allowed H. T. Harvey & Associates botanists to reject 59 of these species as not having a reasonable potential to occur on the Project site. A list of all species considered but rejected, and the reason for rejection, is provided in Attachment D.

The one remaining species, Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), was further considered for potential occurrence on the Project site based on its general habitat requirements and known distribution. This species is described in detail below.

Congdon's Tarplant (*Centromadia parryi* ssp. *congdonii*). Federal Listing Status: None; State Listing Status: None; CNPS: 1B.1. Congdon's tarplant is an annual herb in the composite family (Asteraceae) that is endemic to California. It has a variable blooming period extending from May through November. Congdon's tarplant occurs in valley and foothill grassland habitat, floodplains, and swales, particularly those with alkaline substrates; and in disturbed areas with non-native grasses such as wild oats, ripgut brome, Italian ryegrass (*Festuca perenne*), and seaside barley (*Hordeum marinum*) (CNDDB 2016, CNPS 2016, and Baldwin et al. 2012). Congdon's tarplant occurs in Alameda, Contra Costa, Monterey, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, and Solano Counties (CNDDB 2016). Previously described nearby occurrences in the *San Jose East* and *Watsonville East* USGS 7.5-minute quadrangles are considered extirpated.

A focused survey for Congdon's tarplant on the Project site was conducted on August 2, 2016 within suitable habitat. Congdon's tarplant was not detected. Therefore, this species is determined to be absent from the Project site.

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
Federal or State Endangered, Threatened, or Candidate Species				
Bay checkerspot butterfly	*Euphydryas editha bayensis*	FT, VHP	Native grasslands on serpentine soils. Larval host plants are *Plantago erecta* and/or *Castilleja* sp.	**Absent.** Critical habitat for this species is located immediately north of Anderson Dam (Unit 8) approximately 0.2 mi north of the northernmost end of the Project site (Figure 4; USFWS 2008). The VHP maps suitable habitat for Bay checkerspot butterflies within this critical habitat unit and 0.28 mi east of the site below Anderson Reservoir, but not on the Project site itself (ICF International 2012). No serpentine bunchgrass grassland habitat is present on the site. Therefore, Bay checkerspot butterflies and suitable habitat for this species are determined to be absent.
Central California Coast steelhead Distinct Population Segment	*Oncorhynchus mykiss*	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	**Absent.** The Main Avenue ponds are isolated from streams in the region that provide suitable habitat for anadromous fish species and the Madrone Channel does not provide suitable habitat for steelhead. Thus, this species is determined to be absent.
California tiger salamander	*Ambystoma californiense*	FT, ST, VHP	Vernal or temporary pools in annual grasslands or open woodlands.	**May be Present.** The VHP does not map the Main Avenue Ponds or the Madrone Channel as suitable breeding habitat; however, portions of the site are mapped as suitable upland dispersal and refugial habitat (ICF International 2012). In 2010, a desiccated juvenile tiger salamander was found by District biologists in the bottom of one of the Main Avenue Ponds after it had dried out (H. T. Harvey & Associates 2012b). It is possible that this finding indicates that tiger salamanders have bred in the Main Avenue ponds, or that they occasionally disperse here. However, larval surveys of the ponds in 2012 and 2014 did not detect any individuals of this species (H. T. Harvey & Associates 2012b, 2014), and there is no evidence that tiger salamanders breed in these ponds regularly or that they have bred in recent years. Otherwise, the nearest records of California tiger salamanders in the site vicinity include a nonbreeding record at Anderson Lake County Park (approximately 1.3 mi northeast of the Main Avenue Ponds) and breeding records at Rosendin Pond approximately 1.0 mi east of the Main Avenue Ponds (CNDDB 2016). The species may also breed in a small pond off Cochrane Road at the Anderson Lake County Park entrance 265 ft east of the site (approximately 1.0 mi northeast of the Main Avenue Ponds and 1.4 miles east of the Madrone Channel. The Madrone Channel provides ostensibly suitable breeding habitat for California tiger salamanders

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
				when it contains water, but tiger salamanders are not expected to breed in the channel due to a lack of potential breeding ponds within suitable dispersal distance (i.e., 1.3 mi) (H. T. Harvey & Associates 2012b). Due to the distances between the nearest known records and the Main Avenue Ponds and Madrone Channel, California tiger salamanders are unlikely to disperse to the Main Avenue Ponds and are not expected to disperse to the Madrone Channel or Staging Area 2. There is some potential for the species to occur in the grain, row-crop, hay, and pasture, disked/short-term fallowed habitat in Staging Areas 1 and 2 and along Cochrane Road near Anderson Lake County Park.
California red-legged frog	*Rana draytonii*	FT, CSSC, VHP	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	**Absent as Breeder.** The Main Avenue Ponds and Madrone Channel provide ostensibly suitable breeding habitat for California red-legged frogs in most years, and the Main Avenue Ponds are mapped as suitable breeding habitat by the VHP (ICF International 2012). However, aquatic surveys of the Main Avenue Ponds in 2012 and 2014 did not detect any individuals of this species (H. T. Harvey & Associates 2012b, 2014). The nearest known breeding records of red-legged frogs are approximately 2.8 mi northeast of the Madrone Channel and 2.5 mi northeast of the Main Avenue Ponds on the far side of Anderson Reservoir (CNDDB 2016). In addition, California red-legged frogs likely breed in Rosendin Pond, approximately 1.7 mi northeast of the Madrone Channel and 1.0 mi northeast of the Main Avenue Ponds (S. Rottenborn, pers. obs.). The species may also breed in perennial ponds at Anderson Reservoir below the spillway, as well as a small pond off Cochrane Road 265 ft east of the site (approximately 1.0 mi northeast of the Main Avenue Ponds and 1.4 miles east of the Madrone Channel) near the Anderson Lake County Park entrance. However, California red-legged frogs are not expected to disperse to the Main Avenue Ponds or Madrone Channel from these locations due to the distance, as well as the intervening highly disturbed agricultural habitat and roadways. Thus, California red-legged frogs are determined to be absent from the Main Avenue Ponds and Madrone Channel. However, the VHP maps all of the uplands on the Project site as either dispersal or refugial habitat for California red-legged frogs, and individuals breeding at locations outside the Project boundary may disperse across upland portions of the site, especially along Cochrane Road.

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
Bald eagle	*Haliaeetus leucocephalus*	SE, SP	Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or in cliffs, occasionally on electrical towers. Feeds mostly on fish.	**Absent.** A single pair has nested in a gray pine (*Pinus sabiniana*) on the northeastern shore of Anderson Reservoir at least since 2010, and possibly in several prior years. Additional individuals also forage around Anderson Reservoir, particularly during the nonbreeding season. Due to human activity, this species is not expected to nest within or immediately adjacent to the Project site. Individuals may occasionally forage at the Main Avenue Ponds (e.g., on waterfowl).
Bank swallow	*Riparia riparia*	ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	**Absent as Breeder.** No suitable breeding habitat is present on the Project site. This species has been extirpated from Santa Clara County, with no breeding records since 1933 (Bousman 2007a). Expected to occur on the site only as a rare migrant.
Swainson's hawk	*Buteo swainsoni*	ST	Nests in trees surrounded by extensive marshland or agricultural foraging habitat.	**Absent.** Currently, the species is known to occur in Santa Clara County primarily as a very infrequent transient during migration. Pairs apparently nested in small numbers in the County historically, and there is an 1894 nest record from the Berryessa area, in eastern San Jose (Bousman 2007b). From 2013 through 2015, a pair of Swainson's hawks nested successfully along Coyote Creek in northern Coyote Valley approximately 6.2 mi northwest of the Project site, providing the only County nesting record since the 1890s. Although nesting Swainson's hawks may be returning to the region, the species is not expected to nest within or adjacent to the site due to high levels of human disturbance (e.g., roads, residences, and District activities), and it would not forage on the site owing to the absence of high-quality habitat.
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE, VHP	Nests in heterogeneous riparian habitat, often dominated by cottonwoods (*Populus* spp.) and willows (*Salix* spp.).	**Absent.** The Project site is outside this species' range and does not provide suitable habitat for this species. The only breeding records in Santa Clara County are from Llagas Creek southeast of Gilroy in 1997 and the Pajaro River south of Gilroy in 1932 (Rottenborn 2007b). Otherwise, records in the County include 1–2 singing males along lower Llagas Creek in May 2001 (CNDDB 2016), and a singing male in June 2006 along Coyote Creek near the Coyote Creek Golf Club (H. T. Harvey & Associates 2007). The VHP does not map suitable habitat for this species as occurring on the Project site (ICF International 2012). Although the abundance and distribution of this species may increase as core populations increase, it is unlikely to be more than a rare and very locally occurring breeder along southern Santa Clara County streams (south of the Project site).

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
Tricolored blackbird	*Agelaius tricolor*	SC, CSSC, VHP	Nests near fresh water in dense emergent vegetation.	**Absent as Breeder.** The VHP maps potentially suitable nesting habitat for tricolored blackbirds in the Main Avenue Ponds (ICF International 2012). However, the species is not known to nest at this location. Further, only very narrow strips of emergent vegetation are present on the edges of these ponds due to regular District maintenance activities, and this vegetation is not sufficient to support a nesting colony of this species. Individual tricolored blackbirds may forage throughout the site in small numbers during the nonbreeding season, although no high-quality foraging habitat is present.
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, ST, VHP	Annual grassland or mixed shrub and grassland habitats throughout low, rolling hills and in valleys.	**Absent.** This species has not been recorded on, and is not expected to occur on, the Project site. The closest area of potential occurrence (based on VHP mapping) is approximately 12.4 mi southeast of the Project site near Pacheco Creek and the uppermost reaches of the Pajaro River, where it may occur infrequently and in low numbers during dispersal.
Townsend's big-eared bat	*Corynorhinus townsendii*	SC, CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.	**Absent.** There are no known extant (existing) populations on the Santa Clara Valley floor. Individuals have been recorded recently in Santa Clara County on the United Technologies Corporation Property east of Coyote Ridge (northwest of the Project site), and at Almaden-Quicksilver County Park. However, no breeding populations are known from the vicinity (including at United Technologies Corporation), and no structures on the site provide suitable cave-like roosting habitat for Townsend's big-eared bats. Thus, this species is determined to be absent.
California Species of Special Concern				
Central Valley fall-run Chinook salmon Evolutionary Significant Unit	*Oncorhynchus tshawytscha*	CSSC	Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.	**Absent.** The Main Avenue Ponds are isolated from streams in the region that provide suitable habitat for anadromous fish species and the Madrone Channel does not provide suitable habitat for steelhead. Thus, this species is determined to be absent.
Foothill yellow-legged frog	*Rana boylii*	CSSC, VHP	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	**Absent.** The nearest occurrences of foothill yellow-legged frogs are 5.7 mi west of the site at Chesbro Reservoir, and 5.9 mi northeast of the site in streams at Henry Coe State Park (CNDDB 2016). This species has been extirpated from valley-floor areas of Santa Clara County and is no longer known to occur along the County's streams

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
				below major reservoirs. The VHP maps Coyote Creek below Anderson Dam, which is immediately north of the site, as secondary habitat for foothill yellow-legged frogs, but does not suggest that suitable habitat is present on the site (ICF International 2012).
Western pond turtle	*Actinemys marmorata*	CSSC, VHP	Permanent or nearly permanent water in a variety of habitats.	**May be Present.** The Main Avenue Ponds provide relatively deep (over 4 ft, with the capacity for ponding up to 12 ft) perennial aquatic foraging habitat for pond turtles. The Madrone Channel also provides potential deep foraging habitat for pond turtles when it contains water. However, the managed status of these ponds over the long-term (i.e., subject to raised or lowered water levels depending on management needs) reduces the suitability of these habitats for pond turtles. The VHP maps the Main Avenue Ponds as primary habitat for pond turtles, and surrounding agricultural areas as secondary habitat, but does not map the Madrone Channel as habitat for pond turtles (ICF International 2012). However, western pond turtles are not known to occur in the Main Avenue Ponds or the Madrone Channel, and focused surveys of these habitats in 2012 did not detect the species (H. T. Harvey & Associates 2012a), likely due to the isolation of these ponds from other occurrences of the species in the area (H. T. Harvey & Associates 2012a). The nearest record of pond turtles to the Project site is at Anderson Reservoir, approximately 0.1 mi from the northernmost end of the site, 1.1 mi north of the Main Avenue Ponds, and 1.6 mi northeast of the Madrone Channel on the site. Due to the proximity of the site to Anderson Reservoir, we cannot rule out the possibility that western pond turtles could potentially disperse to the Main Avenue Ponds or Madrone Channel to forage, although we do not expect either site to support breeding populations of these species.
Short-eared owl	*Asio flammeus*	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	**Absent.** Occasionally occurs in Coyote Valley to the north during winter and migration (Cornell Lab of Ornithology 2016). However, the species is not known to breed in the site vicinity, and no suitable foraging habitat is present.
Burrowing owl	*Athene cunicularia*	CSSC, VHP	Nests and roosts in open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.	**Absent.** The VHP maps portions of the Project site as potential burrowing owl nesting/overwintering habitat (ICF International 2012). However, this species is not known to nest in the site vicinity (CNDDB 2016); the vegetated habitat on the site is too limited to provide suitable foraging habitat, and this species has not been observed on the site, most of which is traversed on a daily basis by S. Rottenborn.

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
Long-eared owl	*Asio otus*	CSSC (nesting)	Riparian bottomlands with tall, dense willow and cottonwood stands, and dense upland woodland/ forest with coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), and conifers; forages primarily in adjacent open areas.	**Absent.** Rare resident and occasional winter visitor in Santa Clara County (Noble 2007). The species is not known to breed in the site vicinity, and no suitable foraging habitat is present.
Northern harrier	*Circus cyaneus*	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	**Absent as Breeder.** No suitable nesting habitat for this species occurs on the Project site, and harriers are not known to nest in the site vicinity. Individual harriers may occasionally forage in open areas of the site during migration and winter.
Loggerhead shrike	*Lanius ludovicianus*	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	**Absent as Breeder.** Known to occur on the Project site and in the surrounding vicinity. Ostensibly suitable nesting habitat for loggerhead shrikes is present on and immediately adjacent to the site in dense shrubs and trees. However, no breeding season observations of the species are known from the site vicinity (S. Rottenborn, pers. obs.). Individuals may forage on the site year-round.
Vaux's swift	*Chaetura vauxi*	CSSC (nesting)	Nests in snags in coastal coniferous forests or, occasionally, in chimneys. Forages aerially over many habitats.	**Absent as Breeder.** Vaux's swifts are not known to nest in the site vicinity (Rottenborn 2007c), and no suitable nesting habitat for this species occurs on the site. Individuals may occur as occasional nonbreeding visitors, primarily during migration, and forage aerially over the Project site.
Olive-sided flycatcher	*Contopus cooperi*	CSSC (nesting)	Nests in mature forests with open canopies, along forest edges in more densely vegetated areas, in recently burned forest habitats, and in selectively harvested landscapes.	**Absent as Breeder.** No suitable nesting habitat for this species occurs on the Project site. The species' typical breeding range is limited to somewhat higher-elevation areas in the Santa Cruz Mountains, and olive-sided flycatchers are not known to nest or occur in the site vicinity during the nesting season (Bousman 2007c, Cornell Lab of Ornithology 2016). Occasional nonbreeding visitors may forage on the site during migration.
Yellow warbler	*Setophaga petechia*	CSSC (nesting)	Nests in dense stands of willow and other riparian habitat.	**Absent as Breeder.** No suitable riparian habitat for nesting by this species occurs on the Project site. Occasional nonbreeding visitors may forage on the site during migration.

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	CSSC	Nests in herbaceous vegetation, usually in wetlands or moist floodplains.	**Absent.** The Project site is outside the known distribution of the species.
Yellow-breasted chat	*Icteria virens*	CSSC (nesting)	Nests in dense stands of willow and other riparian habitat.	**Absent.** No suitable breeding or foraging habitat occurs on the Project site.
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	CSSC	Nests in pickleweed (*Salicornia* spp.) dominant salt marsh and adjacent ruderal habitat.	**Absent as Breeder.** Small numbers breed in expanses of short grassland in the Santa Cruz Mountains (Rottenborn 2007d). However, the species is not known to breed in the site vicinity, and because only limited, sparse grassland habitat is present on the Project site, it is not expected to nest there. During the nonbreeding season, small numbers of *alaudinus* and other savannah sparrow subspecies may forage in open areas on the site.
Grasshopper sparrow	*Ammodramus savannarum*	CSSC (nesting)	Nests and forages in grasslands, meadows, fallow fields, and pastures.	**Absent.** No suitable breeding or foraging habitat occurs on the Project site.
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	CSSC	Nests in a variety of habitats including riparian areas, oak woodlands, and scrub.	**Absent.** No woodrat nests were observed on the site during the reconnaissance-level survey, and no suitable riparian, scrub, or oak woodland habitat occurs on the site to support this species.
American badger	*Taxidea taxus*	CSSC	Burrows in grasslands and occasionally in infrequently disked agricultural areas.	**Absent as Breeder.** Agricultural habitats on the site provide only marginal quality habitat due to their highly disturbed nature, and extensive grasslands with burrows are absent. Badgers may occur on the site when moving between nearby higher quality annual grasslands, though they are not expected to den on the site or to occur regularly or in numbers.
Western red bat	*Lasiurus blossevillii*	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	**Absent as Breeder.** May occur in low numbers as a migrant and winter resident, but does not breed on the Project site. Small numbers may roost in foliage in trees along portions of the site.
Pallid bat	*Antrozous pallidus*	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	**Absent as Breeder.** No suitable large trees with cavities are present on the site to provide roosting habitat for this species. However, H. T. Harvey & Associates bat biologists have periodically monitored a maternity colony supporting up to 160-170 individuals in a barn southwest of Cochrane Road near the base of Anderson Dam since

Table 3. Special-Status Animals, their Status, Habitat Description, and Potential for Occurrence on the Project Site

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Proposed Project Site
				1998, and individuals from this colony could potentially forage on the Project site in open areas. In addition, an old barn adjacent to Staging Area 2 on East Main Avenue provides potential roosting habitat for this species. Pallid bats that roost in the site vicinity may forage on the Project site.
State Fully Protected Species				
American peregrine falcon	*Falco peregrinus anatum*	SP	Forages in many habitats; nests on cliffs and tall bridges and buildings.	**Absent as Breeder.** This species may occasionally forage in the Project vicinity during the nonbreeding season, though always at low densities. It is not expected to breed on the Project site, which lacks suitable cliff-like habitat for nesting.
Golden eagle	*Aquila chrysaetos*	SP	Nests on cliffs or in large trees (rarely on electrical towers), forages in open areas.	**Absent as Breeder.** Occasionally occurs as a forager, but there are no known nests in the site vicinity. Due to high levels of human activity in the region, golden eagles are unlikely to nest on or immediately adjacent to the Project site.
White-tailed kite	*Elanus leucurus*	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	**May be Present.** May occur as forager and breeder. Trees on the site, especially along Cochrane Road and Main Avenue near Anderson Lake County Park, may be used for breeding, and the species may forage in open habitats throughout the Project site. Up to one pair may nest on or immediately adjacent to the Project site.
Ringtail	*Bassariscus astutus*	SP	Cavities in rock outcrops and talus slopes, as well as hollows in trees, logs, and snags that occur in riparian habitats and dense woodlands, usually in close proximity to water.	**Absent.** No suitable rock outcrops or talus slopes are present on the site to provide habitat for this species, and there are no known records from the site vicinity. Determined to be absent.

Key to Status Abbreviations: Federally Endangered (FE); Federally Threatened (FT); State Endangered (SE); State Threatened (ST); State Candidate (SC); State Fully Protected (SP); California Species of Special Concern (CSSC); Santa Clara Valley Habitat Plan Covered Species (VHP)

Special-Status Animals

For purposes of this analysis, "special-status" animals are considered animal species that are:

- listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate specie;
- listed under CESA as threatened, endangered or a candidate threatened or endangered species;
- designated by the CDFW as a California species of special concern; or
- listed in the California Fish and Game Code as a fully protected species (fully protected birds are designated in §3511, mammals in §4700, reptiles and amphibians in §5050, and fish in §5515).

The legal status and likelihood of occurrence of special-status animal species known to occur or potentially occurring within 5 mi of the Project site are presented in Table 3. Expanded descriptions are included in Attachment E for those species that are known to occur on the Project site; for which potentially suitable habitat occurs within or in the general vicinity of the Project site; for which the site is accessible to animals from known populations; and for which resource agencies and/or the VHP have expressed particular concern such that more expanded discussion is required. Species that are listed in Table 3 but not discussed in detail in Attachment E have no suitable habitat or reasonable expectation of occurrence on the Project site. A CNDDB (2016) map of known special-status animal species occurrences in the Project vicinity and designated critical habitat for federally listed animal species in the vicinity is provided as Figure 4 in Attachment A.

The Bay checkerspot butterfly (*Euphydryas editha bayensis*), Central California Coast steelhead (*Oncorhynchus mykiss*), least Bell's vireo (*Vireo bellii pusillus*), San Joaquin kit fox (*Vulpes macrotis mutica*), Townsend's big-eared bat (*Corynorhinus townsendii*), Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*), foothill yellow-legged frog (*Rana boylii*), Swainson's hawk (*Buteo swainsoni*), long-eared owl (*Asio otus*), short-eared owl (*Asio flammeus*), yellow-breasted chat (*Icteria virens*), grasshopper sparrow (*Ammodramus savannarum*), San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), and ringtail (*Bassariscus astutus*) are determined to be absent from the Project site due to a lack of suitable habitat.

The Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus cooperi*), northern harrier (*Circus cyaneus*), loggerhead shrike (*Lanius ludovicianus*), and yellow warbler (*Setophaga petechia*), are considered California species of special concern when nesting and may occur on the Project site as nonbreeding transients, foragers, or migrants. However, none of these species has been recorded nesting in or within close proximity to the Project site and they do not typically breed in the habitat types present on the Project site. Because these species are only considered

species of special concern when nesting, they are not “special-status species” when they occur as nonbreeding visitors to the Project site, and are not discussed further in this document.

The bank swallow (*Riparia riparia*), bald eagle (*Haliaeetus leucocephalus*), Bryant’s savannah sparrow (*Passerculus sandwichensis alaudinus*), western red bat (*Lasiurus blossevillii*), golden eagle (*Aquila chrysaetos*), and American peregrine falcon (*Falco peregrinus anatum*) are state listed and/or state fully protected year-round and may occasionally occur on the Project site as nonbreeding migrants, transients, or foragers, but they are not known or expected to breed, to occur regularly, or to occur in large numbers on the Project site. Because these species occur on the proposed Project site only infrequently and/or in small numbers, and as nonbreeders, they are not discussed further in this document.

Western red bats do not breed in the project region, so no maternity roosts would be impacted by the Project. This species roosts solitarily in foliage. Because the Project would not result in loss of trees, it is unlikely that any red bat roosting sites would be impacted, and in the event that such an impact did occur, any roosting red bat would be able to flee before the tree is disturbed. Although such flushed individuals may be subjected to increased risk of predation if flushed during the daytime, few, if any, western red bats are expected to be present in areas where they would be disturbed by project activities. Therefore, impacts on this species would be less than significant and they are not discussed further in this document.

The remaining special-status species included in Table 3 are addressed in Attachment E and under *Biotic Impacts and Mitigation* below because they are known to breed or could potentially breed on or in the immediate vicinity of the Project site, because they occur fairly commonly as non-breeders on the Project site (and thus must be assessed to determine whether they could be substantially affected by Project activities), or because they are of particular concern to resource agencies and/or the VHP. These are the California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), tricolored blackbird (*Agelaius tricolor*), western pond turtle (*Actinemys marmorata*), burrowing owl (*Athene cunicularia*), American badger (*Taxidea taxus*), pallid bat (*Antrozous pallidus*), and white-tailed kite (*Elanus leucurus*).

Regulated and Sensitive Natural Communities

Wetlands and Other Waters of the U.S./Waters of the State

Wetlands and other waters of the U.S./State are extremely important in supporting plant and wildlife species. Due to their importance and the declines in these habitats that have occurred, aquatic and wetland habitat types are considered sensitive and are regulated by state and federal laws.

It is up to the U.S. Army Corps of Engineers to determine whether the Main Avenue Ponds and/or Madrone Channel are regulated as “waters of the U.S.” and up to the Regional Water Quality Control Board to determine whether they are considered “waters of the state”. If they are

determined to be regulated, the majority of areas within the features would fit the definition of "other waters" as opposed to vegetated wetlands.

Riparian Habitats Regulated Under the California Fish and Game Code

Riparian plant and animal communities are extremely important to biodiversity and to the maintenance of biological and physical processes. As described under *Regulatory Setting* and Attachment C, the California Fish and Game Code includes regulations governing the use of, or impacts on, many of the state's fish, wildlife, and sensitive habitats, including the bed and banks of rivers, lakes, and streams. It is up to the CDFW to determine whether it considers Madrone Channel to be subject to its jurisdiction under the Fish and Game Code.

CDFW Natural Communities of Special Concern

CDFW natural communities of special concern are those that are of limited distribution statewide or within a county or region. These communities may or may not contain special-status species or their habitat. Most types of wetlands and riparian communities are considered special-status natural communities because of their limited distribution in California. A query of sensitive habitats in Rarefind (CNDDB 2016) was performed for the *Morgan Hill* and *Mt. Sizer* USGS 7.5-minute quadrangles. Based on this query, serpentine bunchgrass grassland and sycamore alluvial woodland are the only sensitive communities occurring in the Project quadrangles. The closest CNDDB mapped record of serpentine bunchgrass grassland is located in 6.5 mi to the northwest of the Project site, and the closest CNDDB mapped record of sycamore alluvial woodland is 1.8 mi northwest of the site along Coyote Creek. According to the VHP mapping (ICF International 2012), serpentine bunchgrass grassland habitat occurs below Anderson Reservoir approximately 0.37 mi southeast of the site, although it is not recorded as such in the CNDDB (2016). No serpentine bunchgrass grassland or sycamore alluvial woodland are present on the Project site.

CDFW also maintains a list of vegetation alliances and associations within the state of California (California Department of Fish and Game [CDFG] 2010). This list includes global (G) and state (S) rarity ranks for associations and alliances. Alliances and associations currently ranked as S1-S3 are considered highly imperiled. Within the Project site, no land cover types that align with highly imperiled CDFW alliances are present.

Oak Woodlands

Oak woodlands are considered one of California's most productive and important natural communities. They support a rich plant and wildlife community; at least 60 of California's 169 terrestrial mammal species and approximately 60 species of birds are associated with oak woodlands (County of Santa Clara 2005). In addition, oaks play an important role in helping to maintain water quality in streams and rivers by reducing erosion. Yet more than a million acres of oak savanna and oak woodlands in California are estimated to have been lost since 1945 (County of Santa Clara 2005). Major factors contributing to the loss of oak woodlands include urban

growth, conversion to agriculture, lack of regeneration of oak trees, and habitat fragmentation. As a result, numerous state and local agencies have established guidelines, regulations, and ordinances regarding the conservation of oak woodlands (e.g., Oak Woodlands Conservation Act (Fish and Game Code Section 1360-1372), Senate Bill 1334, and the Santa Clara County Oak Woodlands Management Plan (County of Santa Clara 2005).

Although oak woodland habitats occur in the site vicinity, especially near the northernmost portion of the site, no oak woodlands are present on the Project site.

4 Biotic Impacts and Mitigation

Overview

CEQA and its guidelines provide instruction in evaluating impacts of projects on biological resources and determining which impacts will be significant. CEQA defines "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." Under the CEQA guidelines (Section 15065), a project's effects on biotic resources are deemed significant where the project would:

A. "substantially reduce the habitat of a fish or wildlife species"
B. "cause a fish or wildlife population to drop below self-sustaining levels"
C. "threaten to eliminate a plant or animal community"
D. "reduce the number or restrict the range of a rare or endangered plant or animal"

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the CEQA guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would**:**

E. "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 Game or U.S. Fish and Wildlife Service"
F. "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 Game or U.S. Fish and Wildlife Service"
G. "have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act"

H. “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”
I. “conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance”
J. “conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan”

Potential impacts on biological resources as a result of the proposed Project were systematically evaluated at the Project level. These impacts were first evaluated to qualitatively describe how proposed Project activities could impact biological resources, and whether impacts would be temporary (i.e., occurring during Project construction activities and the period immediately following these activities) or permanent. Impacts were then evaluated with the application of District BMPs identified in Attachment B, and any applicable VHP conditions (see below) with which the proposed Project must comply to determine whether the impacts were significant (and thus required mitigation).

Santa Clara Valley Habitat Plan

The proposed project is classified as a “Rural Capital Project,” which is a “covered project” under the VHP (ICF International 2012). Rural Capital Projects include Renovation, replacement, and upgrades of existing facilities such as the proposed project. The Santa Clara Valley Habitat Agency (SCVHA) leads the implementation of the VHP, which is a regional partnership between the CDFW, the USFWS, and six local partners, including the Santa Clara Valley Water District, the County of Santa Clara, Santa Clara Valley Transportation Authority, and the Cities of San Jose, Gilroy, and Morgan Hill. The VHP was adopted in 2013 by all local participating agencies, and permits were issued from the USFWS and CDFW. The VHP is both a habitat conservation plan and natural community conservation plan, or HCP/NCCP. The planning document helps private and public entities plan and conduct projects and activities in ways that lessen impacts on natural resources, including specific threatened and endangered species. The VHP identifies regional lands (called reserves) to be preserved or restored to the benefit of at-risk species, and describes how reserves will be managed and monitored to ensure that they benefit those species. In providing a long-term, coordinated planning for habitat restoration and conservation, the VHP aims to enhance the viability of threatened and endangered species throughout the Santa Clara Valley.

The VHP defines measures to avoid, minimize, and mitigate impacts on covered species and their habitats while allowing for the implementation of certain “covered projects”. Chapter 6 of the VHP includes detailed and comprehensive conditions to avoid and minimize impacts on the 18 “covered species” (nine animal species and nine plant species) included in the plan area, which consists of 519,506 ac, or approximately 62% of Santa Clara County. These conditions are designed to achieve the following objectives:

- provide avoidance of certain covered species during implementation of covered activities throughout the project site;
- prevent take of individuals of certain covered species from covered activities as prohibited by law (e.g., take of fully protected species);
- minimize impacts on natural communities and covered species where conservation actions will take place; and
- avoid and minimize impacts on jurisdictional wetlands and waters throughout the study area to facilitate project-by-project wetland permitting.

In conformance with the VHP, project proponents are required to pay impact fees in accordance with the types and acreage of habitat or "land cover" impacted, and to implement conservation measures specified by the VHP. Land cover impacts are used because it is the best predictor of potential species habitat, and is applicable to all of the covered species (with the exception of the burrowing owl). The SCVHA has mapped the following three fee zones in the VHP area: (1) ranchland and natural lands, (2), agricultural and valley floor lands, and (3) small vacant sites (SCVHA 2016). The following areas are exempt from land cover fees:

- all development that occurs on land mapped by the VHP as urban-suburban, landfill, reservoir (excluding dams), or agriculture developed land cover types;
- urban development in Fee Zones A-C on parcels less than 0.5 ac;
- additions to structures within 50 ft of an existing structure that result in less than 5,000 ft of impervious surface so long as there is no effect on wetland or serpentine land cover types; and
- construction of recreational facilities within the reserve system.

Additional fees in-lieu of providing compensatory mitigation are imposed for projects that impact serpentine habitat, wetlands, and burrowing owls, and for certain projects that result in atmospheric nitrogen emissions, although in some cases, project proponents may provide land to restore or create habitats protected by the VHP in lieu of payment of fees.

The Project site is located on the edge of the VHP Urban Service Area for the City of Morgan Hill with portions of the site falling within the Urban Service Area and portions located outside the Urban Service Area boundary (Figure 5). In regards to the VHP's land cover fee zones, the Project site falls mostly within Fee Zone B (Agricultural and Valley Floor Lands) and Urban Areas (No Land Cover Fee); however, a small portion of the site falls within Fee Zone A (Ranchlands and Natural Lands) (Figure 5). There is no serpentine habitat on the Project site, and therefore, fees in lieu of mitigation for impacts on this habitat type would not be required. Similarly, because the Project does not result in any new vehicle trips over the long term, the fee for nitrogen emissions would not apply. The Project site also does not includes lands mapped as occupied burrowing owl nesting habitat and no burrowing owl fee applies.

Further, the District previously paid VHP permanent impact fees for operation and maintenance work on the entirety of the Main Avenue ponds and the portion of the Madrone Channel within the Project boundary. Therefore, no additional fees for impacts on these features (or the "ponds" land cover type) would be required for the proposed Project.

This impact assessment summarizes the applicable fees and conservation measures that are required by the VHP. The impact analysis below provides the VHP conditions that apply to the proposed Project.

Condition 1- Avoid Direct Impacts on Legally Protected Plant and Wildlife Species

Several wildlife species that occur in the proposed Project vicinity are protected under state and federal laws. Some of these animal species are listed as fully protected under the California Fish and Game Code (e.g., American peregrine falcon and white-tailed kite), and eagles are protected under the Bald and Golden Eagle Protection Act. Further, all native bird species and their nests are protected under the MBTA and California Fish and Game Code. Actions conducted under the VHP must comply with the provisions of the MBTA and California Fish and Game Code.

Condition 3. Maintain Hydrologic Conditions and Protect Water Quality

Condition 3 applies to all projects and identifies a set of programmatic BMPs, performance standards, and control measures to minimize increases of peak discharge of storm water and to reduce runoff of pollutants to protect water quality, including during project construction. These requirements include preconstruction, construction site, and post-construction actions. Preconstruction conditions are site design planning approaches that protect water quality by preventing and reducing the adverse impacts of stormwater pollutants and increases in peak runoff rate and volume. They include hydrologic source control measures that focus on the protection of natural resources. Construction site conditions include source and treatment control measure to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. Post-construction conditions include measures for stormwater treatment and flow control.

Condition 12. Wetland and Pond Avoidance and Minimization

This condition applies to projects that are covered under the VHP and helps to minimize impacts on wetlands and ponds and avoid impacts on high quality wetlands and ponds by prescribing vegetated stormwater filtration features, proper disposal of cleaning materials, and other requirements. Because the Main Avenue Ponds and Madrone Channel will be impacted, the Project will be required to implement the avoidance and minimization measures listed on pages 6-56 to 6-58 of the VHP (see Attachment D).

Condition 17. Tricolored Blackbird

This condition applies to projects that are located within 250 ft of any riparian, coastal, and valley freshwater marsh and helps to protect tricolored blackbirds by prescribing preconstruction surveys, construction buffer zones, biological monitoring, and other requirements. If a project is located within 250 ft of habitat mapped as pond by the VHP, a qualified biologist must confirm that the pond land cover type is present. If a qualified biologist verifies that the project area is within 250 ft of pond habitat, a qualified biologist must conduct a field investigation to identify and map potential nesting substrate. If suitable nesting substrate is identified, avoidance and minimization measures must be implemented (see pages 4-43 to 4-44 of the VHP).

The proposed Project is located within 250 ft of an area (i.e., the Main Avenue Ponds) mapped by the VHP as suitable nesting habitat for the tricolored blackbird and the field verified mapping for the Project (Figure 2) confirms the presence of this habitat. Therefore, per Condition 17 of the VHP, H. T. Harvey & Associates wildlife ecologist and ornithologist Robin Carle, M.S., conducted a field investigation to identify and map potential nesting substrate for tricolored blackbirds on February 26, 2016. Recent and ongoing facility maintenance at the Main Avenue Ponds had removed emergent vegetation as part of the maintenance cycle to return the facilities to peak percolation performance, and no suitable vegetation for nesting by tricolored blackbirds was present in the Main Avenue Ponds. Thus, no additional surveys or avoidance and minimization measures are required.

Condition 20. Avoid and Minimize Impacts to Covered Plant Occurrences

This condition applies to projects that are located in areas where covered plant species are likely to occur and within covered Plant Survey Areas; this condition helps protect certain plant species by requiring plant surveys, specific avoidance and minimization practices (e.g., using seclusion fencing), and monitoring.

If a project is located within a Plant Survey Area as mapped by the VHP, a qualified biologist must verify if the on-site land cover is suitable to support one of the nine VHP covered plants. If the relevant land cover type(s) is determined to be present, surveys for covered plants must be conducted. If an occurrence of a covered plant species is found, avoidance and minimization measures must be implemented (see pages 4-49 to 4-54 of the VHP).

Portions of the Project site are located within a Plant Survey Area identified by the VHP. However, based on the verified land cover map (Figure 2) it was determined that no suitable habitat (i.e., serpentine bunchgrass grassland, serpentine rock outcrop, serpentine seep, mixed serpentine chaparral, mixed oak woodland and forest with serpentine soils, coast live oak forest and woodland with serpentine soils, or northern coastal scrub and Diablan sage scrub with serpentine soils) for any of the nine covered plant species is present on the Project site. Rather, a portion of the Project site is located within a Plant Survey Area because of covered plant occurrences on nearby serpentine habitats that occur on a different landform and soil type than is present in the Project site. Thus, no surveys or avoidance and minimization measures are required.

Less-Than-Significant Impacts

Impacts on Ponds and Water Quality

Impacts on the Madrone Channel and the Main Avenue Ponds would occur during Project construction. These impacts are largely minor, and include very limited (0.18 acre of) permanent impacts related to the installation of a new intake structure within the Madrone channel, and 0.01 acre of temporary impacts related to access required to construct the new intake and upgrade the discharge pipe at the Main Avenue Ponds (Table 4). Dewatering may be required at the Madrone Channel where the new intake structure will be built, and within the Main Avenue Ponds at the discharge pipe location. Such dewatering will temporarily eliminate or reduce the extent of aquatic habitat in these facilities. However, because both the Madrone Channel and the Main Avenue Ponds have hydrology that is controlled as part of normal maintenance and operation activities (including occasional dewatering of sections of the channel and various ponds by opening and closing valves), such dewatering is not unusual for these locations, and animal species that are intolerant of the hydrologic variability in these facilities do not occur here. As a result, dewatering of the Madrone Channel and Main Avenue Ponds will not be an isolated, Project-specific occurrence, and such dewatering is not considered a substantial Project impact. However, if these ponds are determined to be waters of the U.S/State, permanent impacts, including placement of fill to construct new structures, would be significant in accordance with CEQA Significance Criterion G in the absence of VHP compliance measures discussed below.

Table 4. Proposed Project Impacts

Habitat	Permanent Impact (ac)	Temporary Impact (ac)
Grain, row-crop, hay and pasture, disked/short-term fallowed	0.6	0.6
Urban-Suburban	0.0	8.1
Pond	0.18	0.01
Total	**0.78**	**8.71**

Construction activities could have deleterious effects on water quality within the ponds or downstream of the Madrone Channel, which occasionally is allowed to discharge into East Little Llagas Creek. These effects could occur from an increase in sedimentation from working in adjacent areas and allowing disturbed soils to enter the ponds, or increases in water turbidity from working in wetted environments with unconsolidated (non-hardscaped) bottoms or banks. Such water quality effects could spread downstream from the Madrone Channel within the watershed if not avoided, potentially resulting in degradation of the health of aquatic species and downstream habitats. As a result, water-quality impacts would be significant in the absence of VHP compliance measures discussed below.

However, the Project will comply with all VHP conditions, including Conditions 3 and 12. Condition 3 requires implementation of design phase, construction phase, and post-construction phase

measures, including programmatic BMPs, performance standards, and control measures, to minimize increases of peak discharge of storm drain water and to reduce runoff of pollutants to protect water quality, including during construction. VHP Condition 12 requires the implementation of design phase and construction phase measures to avoid and minimize impacts on wetlands and ponds, including erosion control measures, fencing of avoided wetlands during construction, establishment of buffers between wetlands and refueling areas, and measures to minimize the spread of invasive species. In addition, the Project will implement District BMPs HM-1 through HM-4 and WQ-1 through WQ-9 (see Appendix B) to minimize impacts on water quality. Finally, as described above, the District previously paid VHP permanent impact fees for operation and maintenance work on the entirety of the Main Avenue ponds and the portion of the Madrone Channel within the Project boundary. These fees will be used by the SCVHA to help compensate for impacts on aquatic habitats. Thus, with incorporation of relevant VHP conditions, impacts on ponds and water quality will be minimized and will be less than significant.

Impacts on the California Tiger Salamander, California Red-Legged Frog, and Western Pond Turtle

Three VHP-covered wildlife species, the California tiger salamander (federally and state listed as threatened), California red-legged frog (federally listed as threatened and a California species of special concern), and western pond turtle (a California species of special concern), potentially occur on the Project site and may breed on or near the site.

Impacts on the California Tiger Salamander

Suitable breeding habitat for California tiger salamanders consists of temporarily ponded environments (e.g., vernal pool, ephemeral pool, or human-made pond) that hold water for a minimum of 3–4 months and that are surrounded by uplands supporting small mammal burrows. There is no evidence that California tiger salamanders breed in the Main Avenue Ponds or the Madrone Channel regularly or that they have bred in these ponds in recent years (H. T. Harvey & Associates 2012b, 2014), and the VHP does not map the Main Avenue Ponds or the Madrone Channel as suitable breeding habitat for the California tiger salamander (ICF International 2012). However, a desiccated juvenile tiger salamander was found in the bottom of one of the Main Avenue Ponds after it had dried out in 2010 (H. T. Harvey & Associates 2012b). Thus, we cannot rule out the possibility that tiger salamanders may occasionally breed in the Main Avenue ponds or disperse there. The Madrone Channel provides ostensibly suitable breeding habitat for California tiger salamanders when it contains water, but tiger salamanders are not expected to breed in the channel due to a lack of evidence of previous breeding (H. T. Harvey & Associates 2012b, 2014) and a lack of potential breeding ponds within suitable dispersal distance (i.e., 1.3 mi) (H. T. Harvey & Associates 2012b).

The VHP maps portions of the Project site as suitable upland dispersal and refugial habitat for the California tiger salamander and there is some potential for the species to occur in the grain, row-crop, hay, and pasture, disked/short-term fallowed habitat in Staging Areas 1 and 2 and along

Cochrane Road near Anderson Lake County Park. The California tiger salamander may occur on the Project site during seasonal movements to and from breeding ponds outside the Project site and may use California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) burrows as upland refugia (e.g., to avoid predation and prevent dehydration). However, due to the regular disturbance of the agricultural fields, these areas do not provide large numbers of subterranean refugia for tiger salamanders.

The Project would result in the permanent loss of 0.78 ac of potential California tiger salamander habitat, including 0.60 ac of potential upland dispersal habitat and 0.18 ac of pond habitat, and temporary impacts on 0.60 ac of upland dispersal habitat (Table 4). However, the majority of Project impacts would occur in urban-suburban land cover (i.e., paved roadways) that does not provide suitable upland or aquatic habitat for the species.

If California tiger salamanders are present during Project activities, individuals could be at risk for injury or mortality due to equipment, vehicle traffic, and foot traffic. If any tiger salamanders are using burrows on the Project site as upland refugia, they could be killed in their burrows or trapped and suffocated by the passage of heavy equipment. Substrate vibrations may cause individuals to move out of refugia, thus exposing them to a greater risk of predation or desiccation, may interfere with predator detection, and may result in a decrease in time spent foraging. Such impacts would be temporary in nature, occurring only during construction activities.

Due to the low quality of potential breeding habitat on the Project site (as described above), and the low number of subterranean refugia on the site, the Project would not impact high-quality California tiger salamander habitat, nor would it impact large numbers of individuals. Nevertheless, because of the regional rarity of this species, increased mortality of California tiger salamanders would be significant under CEQA (Significance Criteria D and E) in the absence of BMPs and VHP compliance measures discussed below.

Impacts on the California Red-Legged Frog

California red-legged frogs inhabit perennial freshwater pools, streams, and ponds, but their preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Nonbreeding frogs may be found adjacent to streams and ponds in grasslands and woodlands, and may travel up to 2 mi from their breeding locations across a variety of upland habitats (Bulger et al. 2003, Fellers and Kleeman 2007).

The Main Avenue Ponds and ponded areas of the Madrone Channel provide ostensibly suitable breeding habitat for California red-legged frogs in most years, and the Main Avenue Ponds are mapped as suitable breeding habitat for this species by the VHP (ICF International 2012). However, aquatic surveys of the Main Avenue Ponds in 2012 and 2014 did not detect any individuals of this species (H. T. Harvey & Associates 2012b, 2014). Further, although potentially suitable breeding ponds at the base of Anderson Reservoir and near Cochrane road are located

within dispersal distance of the Project site, California red-legged frogs are not expected to disperse from these locations to the Project site due to the highly disturbed agricultural habitat and roadways present between these areas. Thus, California red-legged frogs are determined to be absent from the Main Avenue Ponds and Madrone Channel, and the species is not expected to breed on the Project site.

The VHP maps upland areas of the Project site as suitable upland dispersal and refugial habitat for California red-legged frogs (ICF International 2012), and based on known occurrences of California red-legged frogs at Almaden Lake County Park, this species may occur on the Project site during dispersal to and from breeding ponds. It is most likely to occur within the northernmost portion of the Project site along Cochrane Road, especially during rain events when individuals disperse between upland refugia and breeding areas.

Project activities would result in the permanent (0.78 ac) and temporary (0.60 ac) loss of potential California red-legged frog foraging and dispersal habitat (i.e., grain, row-crop, hay and pasture, disked/short-term fallowed and pond), and could potentially result in the loss or disturbance of individuals (e.g., during maintenance activities) for reasons similar to those described for the California tiger salamander above, a significant impact. Such impacts would be temporary in nature, occurring only during construction activities.

Due to the low likelihood that California red-legged frogs occur on the site, lack of potential breeding habitat, and low number of subterranean refugia, the Project would not impact high-quality California red-legged frog habitat, nor would it impact large numbers of individuals. Nevertheless, because of the regional rarity of this species, increased mortality of California red-legged frogs would be significant under CEQA (Significance Criteria D and E) in the absence of BMPs and VHP compliance measures discussed below.

Impacts on the Western Pond Turtle

Suitable habitat for the western pond turtle consists of ponds or instream pools (i.e., slack water environments) with available basking sites, nearby upland areas with clay or silty soils for nesting, and shallow aquatic habitat with emergent vegetation and invertebrate prey for juveniles (Jennings and Hayes 1994). The VHP maps the Main Avenue Ponds as primary habitat for pond turtles and surrounding agricultural areas as secondary habitat, but does not map the Madrone Channel as habitat for pond turtles (ICF International 2012). The Main Avenue Ponds provide relatively deep (over 4 ft, with the capacity for ponding up to 12 ft) perennial aquatic foraging habitat for pond turtles. The Madrone Channel also provides potential deep foraging habitat for pond turtles when it contains water. However, the managed status of these ponds over the long-term (i.e., subject to raised or lowered water levels depending on management needs) reduces the suitability of these habitats for pond turtles. Further, western pond turtles are not known to occur in the Main Avenue Ponds or the Madrone Channel, and focused surveys of these habitats in 2012 did not detect the species (H. T. Harvey & Associates 2012a), likely due to the isolation of these ponds from other occurrences of the species in the area (H. T. Harvey & Associates

2012a). The nearest record of pond turtles to the Project site is at Anderson Reservoir, approximately 0.1 mi from the northernmost end of the site, 1.1 mi north of the Main Avenue Ponds, and 1.6 mi northeast of the Madrone Channel on the site. Pond turtles are not expected to disperse from this location to the Main Avenue Ponds or Madrone Channel due to the highly disturbed agricultural habitat and roadways present between these areas. Nevertheless, we cannot rule out the possibility that western pond turtles could potentially occur within the Project boundary, although we do not expect the site to support breeding populations of this species.

Project activities would result in the permanent loss of 0.78 ac of potential western pond turtle foraging and dispersal habitat, including 0.60 ac of upland habitat and 0.18 ac of aquatic habitat, and temporary impacts on 0.60 ac of upland foraging and dispersal habitat. In the unlikely event that western pond turtles are present during Project activities, individual turtles may be harmed or killed due to crushing by construction personnel or equipment, or as a result of desiccation or burying (e.g., during grading). Although western pond turtles are widespread in the Project region, the species is not particularly abundant, and the loss of individuals could reduce the viability of a population to the extent that it would be extirpated. Therefore, this impact is considered potentially significant (Significance Criteria D and E) in the absence of BMPs and VHP compliance measures discussed below.

BMPs to Reduce Impacts on the California Tiger Salamander, California Red-legged Frog, and Western Pond Turtle

To help avoid and minimize Project impacts on these VHP-covered special-status species, the District would implement the following BMPs during construction activities. A description of each BMP is provided in Appendix B.

- BMP BI-2: Avoid Animal Entry and Entrapment
- BMP BI-3: Minimize Predator Attraction
- WQ-2: Limit Impacts From Staging and Stockpiling Materials
- WQ-6: Prevent Water Pollution

Summary for California Tiger Salamander, California Red-legged Frog, and Western Pond Turtle

The VHP does not provide species-level avoidance and minimization measures for these species. Nevertheless, the Project would adhere to general conditions of the VHP described previously, which would help to reduce proposed Project impacts on these species and their habitats. For example, VHP Condition 3 requires implementation of numerous aquatic avoidance and minimization measures, described in Table 6-2 of the VHP, which would avoid and minimize impacts on aquatic habitat for these species. In addition, the District would pay VHP impact fees for upland impacts (as described above, fees for impacts on ponds within the Project area were paid previously); these fees would contribute to the VHP's conservation program, which includes habitat acquisition, restoration, preservation, and management targeted at all three species.

Implementation of District BMPs and compliance with VHP conditions would minimize potential impacts to California tiger salamanders, California red-legged frogs, western pond turtles, and their habitats during Project construction, and payment of VHP impact fees would help to compensate for any residual impacts through conservation of these species' populations and habitats. As a result, impacts on these species will be less than significant.

Impacts on Non-Sensitive Habitats and Associated Common Plant and Animal Communities

Project activities would result in permanent impacts on grain, row-crop, hay and pasture, disked/short-term fallowed land cover (Figure 6, Table 4). Impacts on this land cover during Project activities would reduce the extent of vegetation on the Project site and would result in a reduction in abundance of some of the common plant and animal species that use the site. Temporary impacts on this land cover type, as well as urban-suburban (i.e., currently developed) land cover, will also occur. However, the habitat provided by these land cover types is abundant and widespread regionally, and within the Project site does not represent particularly sensitive or valuable habitat (from the perspective of providing important plant or wildlife habitat) or an exemplary occurrence of this habitat type. Neither the agricultural areas nor the developed areas impacted by the Project support native vegetation or provide high-quality habitat for animal species. Therefore, impacts on these habitats are considered less than significant. Further, because the number of individuals of any common plant or animal species within these habitats, and the proportion of these species' regional populations that could be disturbed, is very small, the Project's impacts would not substantially reduce regional populations of these species. Thus, these impacts do not meet the CEQA standard of having a *substantial* adverse effect and thus would not be considered significant under CEQA.

Although no mitigation is necessary to reduce Project impacts on these non-sensitive habitats and associated plant and animal species to less-than-significant levels under CEQA, these species will benefit from the conservation program of the VHP (e.g., preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the District would contribute via payment of VHP impact fees.

Impacts on Special-Status Bird Species

Breeding Special-Status Bird Species

The only special-status bird species that could potentially nest on or close to the Project alignment is the white-tailed kite, a state fully protected species. Implementation of the proposed Project would result in the loss of potential nesting and foraging habitat for the white-tailed kite and, in the absence of any protective measures, could result in the destruction or abandonment of active nests of this species, should it nest on the site during Project implementation. However, no more than one pair of white-tailed kites is expected to nest on the Project site, if this species is present at all. Thus, the loss of individuals potentially resulting from Project activities would represent a

very small fraction of the regional population of this species. Additionally, the upland habitats on the Project site that provide suitable nesting habitat represent a small proportion of the habitats that support this species regionally. Therefore, neither the potential loss of individual white-tailed kites nor the loss of potential nesting habitat would rise to the CEQA standard of having a *substantial* adverse effect, and these impacts would thus not constitute a significant impact on this species or its habitat under CEQA. However, all native bird species, including white-tailed kites, are protected from direct take by federal and state statutes, and the District will comply with VHP Condition 1 either by restricting work to the non-nesting season (September 1 through January 31) or by conducting preconstruction surveys prior to Project activities and maintaining appropriate buffers around active nests of protected birds.

Although no mitigation is necessary to reduce Project impacts on the white-tailed kite to less-than-significant levels under CEQA, the District will implement BMP BI-1 Nesting Birds to further minimize impacts on the white-tailed kite. In addition, this species will benefit from the conservation program of the VHP (e.g., preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the District would contribute via payment of VHP impact fees.

Non-Breeding Special-Status Birds

Several special-status bird species occur in the Project area as non-breeding migrants, transients, or foragers, but they are not known or expected to breed or occur in large numbers on the Project site; these include the bank swallow, Bryant's savannah sparrow, American peregrine falcon, golden eagle, and tricolored blackbird.

The bank swallow (state listed as endangered) is not expected to nest on the Project site due to a lack of suitable habitat, but may occur as a rare migrant. Bryant's savannah sparrow (a California species of special concern) is not expected to breed on the Project site due to a lack of suitable breeding habitat. However, during the non-breeding season, individuals may forage in open areas throughout the Project site. The golden eagle and American peregrine falcon (both fully protected species) are not expected to breed on the Project site due to a lack of suitable nesting habitat. Individuals of these species may occasionally occur on the site while foraging, but are not expected to occur regularly. The VHP maps potentially suitable nesting habitat for tricolored blackbirds in the Main Avenue Ponds (ICF International 2012). However, the species is not known to nest at this location. Further, only very narrow strips of emergent vegetation are present on the edges of these ponds due to regular District maintenance activities, and this vegetation is not sufficient to support a nesting colony of this species. Therefore, the tricolored blackbird is not expected to nest on the Project site. Individual tricolored blackbirds may forage throughout the site in small numbers during the nonbreeding season, although no high-quality foraging habitat is present.

The proposed Project would have some potential to impact foraging habitats and/or temporarily disturb individuals of these species. Maintenance activities associated with the Project might

result in a temporary direct impact through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during maintenance activities) but would not result in the loss of individuals, as individuals would be easily able to fly away from any areas of Project disturbance before injury could occur. Further, the Project site does not provide important foraging habitat used regularly or by large numbers of individuals of any of these species. Therefore, this impact would be less than significant.

Although no mitigation is necessary to reduce Project impacts on these species to less-than-significant levels under CEQA, these species will benefit from the conservation program of the VHP (e.g., preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the District would contribute via payment of VHP impact fees.

Impacts on the Pallid Bat

The pallid bat (a California species of special concern) may be present on the Project site as an occasional forager, but it is not expected to breed there due to a lack of artificial structures with suitable roost sites or trees with suitably large cavities for roosting. H. T. Harvey & Associates bat biologists have periodically monitored a maternity colony supporting up to 160-170 individuals in a barn southwest of Cochrane Road near the base of Anderson Dam since 1998, and individuals from this colony could potentially forage on the Project site in open areas. In addition, an old barn adjacent to Staging Area 2 on East Main Avenue provides potential roosting habitat for this species.

Impacts on agricultural habitats would result in the loss of some foraging habitat and prey production areas for the pallid bat. However, given the extent of such habitats regionally, and in areas immediately outside the Project site, the proposed Project's permanent and temporary impacts on pallid bat habitat would affect only a very small proportion of available habitat, and this impact would not substantially impact local or regional pallid bat populations. Thus, this impact would be less than significant.

Although no mitigation is necessary to reduce Project impacts on the pallid bat to less-than-significant levels under CEQA, this species will benefit from the conservation program of the VHP (e.g., preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the District would contribute via payment of VHP impact fees.

Impacts on the American Badger

There is a low probability of the American badger (a California species of special concern) occurring on the Project site. If individuals do occur on the site during Project activities, there is some (albeit low) potential for individuals to suffer injury or mortality from construction machinery or from increased construction-related traffic on the road during the construction process. However, the number of badgers that could potentially occupy the Project site is very low owing to the lack of high-quality, undisturbed grassland in the site vicinity, and no suitable badger

denning habitat would be lost due to Project activities (and thus impacts to individuals in dens will not occur). As a result, the probability of injury or mortality of any badgers as a result of the Project is very low. Further, the amount of dispersal habitat impacted would be very low compared with the amount of suitable habitat available regionally. Therefore, the Project would not have substantial effects on regional populations of badgers, or on their habitats, and this impact is determined to be less than significant.

Although no mitigation is necessary to reduce Project impacts on the American badger to less-than-significant levels under CEQA, this species will benefit from the conservation program of the VHP (e.g., preservation, enhancement, and management of numerous habitat types throughout the VHP Reserve System) to which the District would contribute via payment of VHP impact fees.

Impacts on Wildlife Movement

Environmental corridors are segments of suitable habitat that provide connectivity between larger areas of suitable habitat, allowing species to disperse through otherwise unsuitable areas. On a broader level, corridors may also function as avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas. In the project region, environmental corridors often consist of riparian areas along streams, rivers, or other natural features. In addition, the rivers and streams themselves may serve as migration corridors for fish and other aquatic species.

The Project site is not located within a particularly important corridor for wildlife movement; the Project vicinity contains extensive open and low-density residential habitat suitable for use by terrestrial species moving among areas of core habitat rather than providing more limited suitable habitat surrounded by non-habitat. As a result, wildlife can move on a broad front along innumerable pathways in the Project vicinity. In addition, no high-quality cover for use by dispersing wildlife is present. For example, no multi-layered, woody, riparian vegetation, is present along the Madrone Channel, and thus the channel does not provide a continuously vegetated corridor that terrestrial wildlife can use as cover while moving between habitats in the region. Further, the intermittent nature of the channel (due to periodic drawdowns by the District for groundwater recharge purposes) means it does not provide an important movement corridor for aquatic species.

Project activities may result in a temporary, and very small-scale and localized, impediment to wildlife movement. If animals try to avoid equipment and activity along the pipeline alignment, they may attempt to cross the roads in the Project area, increasing their risk of road mortality. However, the Project has the potential to affect wildlife movement only during construction, and it does not include any structures or features that will result in long-term impediments to movement. Likewise, the Project is not expected to substantially impact movement by aquatic species, as use of the Project site by species associated with wetter habitats (such as amphibians) is already

low due to the intermittent nature of the Madrone Channel and general lack of aquatic and riparian vegetation. Overall, the Project site would retain its value for wildlife movement after Project completion, as no new barriers to wildlife movement would be constructed. Therefore, the proposed Project would not substantially impact wildlife movement through the area and this impact would be less than significant under CEQA.

5 References

Albion Environmental Inc. 2008. 2008 Nesting Burrowing Owl Survey Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP). Final Draft. Prepared for Santa Clara County.

Austin C. C. and H. B. Shaffer. 1992. Short, medium, and long-term repeatability of locomotor performance in the tiger salamander *Ambystoma californiense*. Functional Ecology 6:145-153.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley.

Barbour, R. W. and W .H. Davis. 1969. Bats of America. University of Kentucky Press, Lexington, Kentucky.

Barry, S. J. and H.B. Shaffer. 1994. The status of the California tiger salamander (*Ambystoma californiense*) at Lagunita: A 50-year update. Journal of Herpetology 28(2):159-164.

Bousman W. G. 2007a. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Bousman, W. G. 2007b. Swainson's hawk, *Buteo swainsoni*. Pages 506-507 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Bousman, W. G. 2007c. Olive-sided flycatcher, *Contopus cooperi*. Pages 272-273 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Bulger, J. D., N. J. Scott, Jr., and R. B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. *Biological Conservation* 110:85-95.

Bury, R. B. and D. J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) - western pond turtle, Pacific pond turtle in G. J. Rhodin, C. H. Pritchard, P. P. van Dijk, R. A. Saumure, K. A. Buhlmann, and J. B. Iverson, editors. Conservation Biology of Freshwater Turtles and

Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs.

(CDFG) California Department of Fish and Game. 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program, California Department of Fish and Game. Sacramento, CA. September 2010.

(CDFG) California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. March 7, 2012.

(CNDDB\ California Natural Diversity Data Base. 2016. Rarefind 5. California Department of Fish and Game, Biogeographic Data Branch. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp. Accessed through March 2016.

(CNPS) California Native Plant Society. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society. Sacramento, California. http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed March 2016.

Cornell Lab of Ornithology. 2016. eBird. http://www.ebird.org/. Accessed March 2016.

County of Santa Clara. 2005. An Oak Woodlands Management Plan for Santa Clara County. Adopted by Santa Clara County Board of Supervisors on May 3, 2005.

Dunk, J. R. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Dunk, J. R., and R. J. Cooper. 1994. Territory-size regulation in black-shouldered kites. Auk 111:588-595.

Erichsen, E. L., K. S. Smallwood, A. M. Commandatore, B. W. Wilson, and M. D. Fry. 1996. White-tailed kite movement and nesting patterns in an agricultural landscape in D. Bird, D. Varland, and J. Negro, editors. Raptors in Human Landscapes. Academic Press, San Diego, California.

Fellers, G. M. 2005. *Rana draytonii* California red-legged frog. Pages 552-554 in M. Lannoo, editor. Amphibian declines: The Conservation Status of United States species. University of California Press, Berkeley, California.

Fellers, G. M., and P. M. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: Implications for conservation. Journal of Herpetology 41:276-286.

Ferguson, H., and J. M. Azerrad. 2004. Management recommendations for Washington's priority species: Volume V. Mammals, pallid bat (*Antrozous pallidus*). Washington Department of Fish and Game.

Google Inc. 2016. Google Earth Software Version 7.1.5.1557.

H. T. Harvey & Associates. 2007. Measure B Consolidated Biological Mitigation Project Year 3 Monitoring Report. Prepared for the Santa Clara Valley Transportation Authority.

H. T. Harvey & Associates. 2012a. Santa Clara Valley Water District Western Pond Turtle Site Assessments and Surveys at Selected Santa Clara County Locations. October 2012.

H. T. Harvey & Associates. 2012b. Santa Clara Valley Water District California Tiger Salamander Surveys and Site Assessments at Selected Santa Clara County Locations. August 2012.

H. T. Harvey & Associates. 2014. California Tiger Salamander Larval Survey Report, Main Avenue Groundwater Percolation Facility. July 2014.

ICF International. 2012. Final Santa Clara Valley Habitat Plan. Santa Clara County, California. Prepared by the City of Gilroy, City of Morgan Hill, City of San Jose, County of Santa Clara, Santa Clara Valley Transportation Authority, and Santa Clara Valley Water District. August. http://www.scv-habitatplan.org.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Inland Fisheries Division.

Johnston, D. S., B. Hepburn, J. Krauel, T. Stewart, and D. Rambaldini. 2006. Winter roosting and foraging ecology of pallid bats in Central Coastal California. Bat Research News 47:115.

Miller, K. J. 1994. Endangered and threatened wildlife and plants; Proposed endangered status for the California red-legged frog. Federal Register 59:4888-4895.

Miner, K. L. and D. C. Stokes. 2005. Bats in the South Coast Ecoregion: Status, conservation, issues, and research needs. USDA Forest Service. Gen. Tech. Rep.

(NRCS) Natural Resources Conservation Service. 2016. Web Soil Survey. U.S. Department of Agriculture. Available at: http://websoilsurvey.nrcs.usda.gov.

Noble, P. L. 2007. Long-Eared Owl, *Asio otus*. Pages 238-239 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

(NWI) National Wetlands Inventory. 2014. Wetlands Mapper. U.S. Fish and Wildlife Service. Accessed March 2016 from: http://www.fws.gov/wetlands/Data/Mapper.html

Orloff, S. 2007. Migratory movements of California tiger salamanders in upland habitat-a five-year study. Pittsburg, California. Prepared for Bailey Estates, LCC by Ibis Environmental, Inc. May.

Polite, C. 1990. Black-shouldered Kite *Elanus caeruleus*. Pages 120-121 in D. C. Zeiner, W. F. Laudenslayer Jr, K.E. Mayer, and M. White (eds.), California Department of Fish and Game, California Statewide Wildlife Habitat Relationships System. California's Wildlife, Vol II: Birds.

PRISM Climate Group. 2013. Online PRISM Data Explorer. Oregon State University, Corvallis, OR. Accessed from http://oldprismmap.nacse.org/. Accessed March 2016.

Rosenberg, D. K., L. A. Trulio, D. Catlin, D. Chromczack, J. A. Gervais, N. Ronan, and K. A. Haley. 2007. The Ecology of the Burrowing Owl in California. Unpubl. report prepared for the Bureau of Land Management.

Rosier, J. R., N. A. Ronan, and D. K. Rosenberg. 2006. Post-breeding dispersal of burrowing owls in an extensive California grassland. American Midland Naturalist 155:162-167.

Rottenborn, S. C. 2007a. Tricolored Blackbird, *Agelaius tricolor*. Pages 426-427 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Rottenborn, S. C. 2007b. Bell's Vireo, *Vireo bellii*. Pages 290-291 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Rottenborn, S. C. 2007c. Vaux's swift *Chaetura vauxi*. Pages 244-245 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Rottenborn, S. C. 2007d. Savannah Sparrow, *Passerculus sandwichensis*. Pages 408-409 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Santa Clara Valley Habitat Agency. 2016. Santa Clara Valley Habitat Agency Geobrowser. Available at: http://www.hcpmaps.com/habitat/. Accessed through August 2016.

Shaffer, H.B., and P.C. Trenham. 2005. *Ambystoma californiense* Gray, 1853. In Amphibian declines: The conservation status of United States species, edited by M. Lannoo: University of California Press.

Shuford, W. D. and T. Gardali, editors. 2008. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Western Field Ornithologists and California Department of Fish and Game, Camarillo and Sacramento, California.

Skonieczny, M. F., and J. R. Dunk. 1997. Hunting synchrony in white-tailed kites. Journal of Raptor Research.

Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. Boston, Massachusetts.

Storer, T.I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27(1):1-342.

Trenham, P. C., W. D. Koenig, and H. B. Shaffer. 2001. Spatially autocorrelated demography and interpond dispersal in the salamander Ambystoma californiense. Ecology 82:3519-3530.

Trenham, P. C. and H. B. Shaffer. 2005. Amphibian upland habitat use and its consequences for population viability. Ecological Applications 15:1158-1168.

Trulio, L. A. 2007. Burrowing owl, *Athene cunicularia*. Pages 236-237 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

(USFWS) U.S. Fish and Wildlife Service. 1996. Endangered and threatened wildlife and plants: Determination of threatened status for the California red-legged frog. Federal Register 61:25813-25833.

(USFWS) U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Region 1.

(USFWS) U.S. Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants: Determination of endangered status for the Sonoma County Distinct Population Segment of the California tiger salamander. Final rule. Federal Register 68:13498-13520.

(USFWS) U.S. Fish and Wildlife Service. 2005. Endangered and threatened wildlife and plants: Designation of critical habitat for the California tiger salamander, Central Population. Final rule. Federal Register 70:49380-49458.

(USFWS) U.S. Fish and Wildlife Service. 2008. Endangered and threatened wildlife and plants: Final determination of critical habitat for the Bay checkerspot butterfly (*Euphydryas editha bayensis*); Final rule. Federal Register 73:50406-50452.

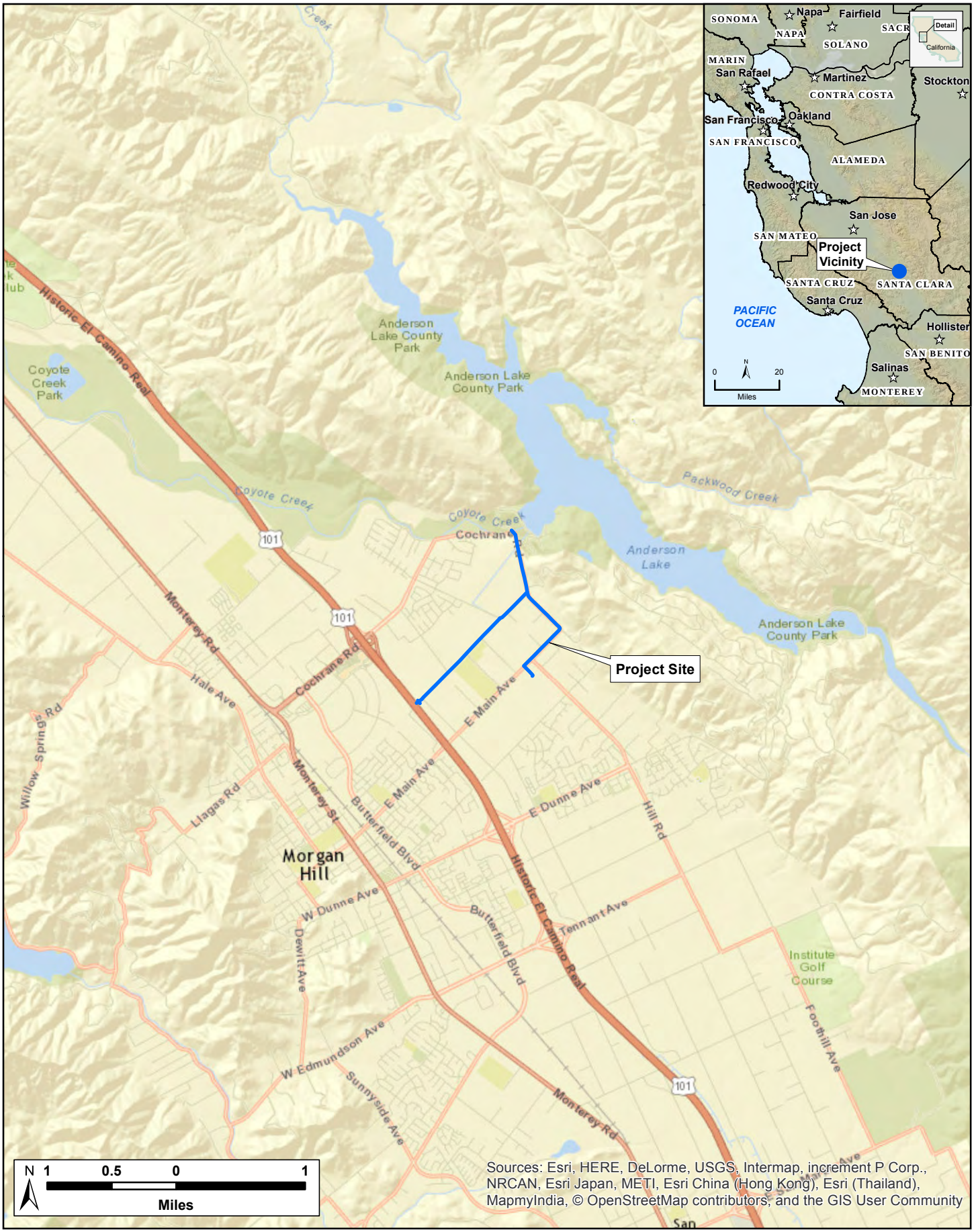
(USFWS) U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants: Revised designation of critical habitat for California red-legged frog; Final rule. Federal Register 75:12816-12959.

Wilson, D. E. and S. Ruff. 1999. The Smithsonian Book of North American Mammals. Smithsonian Institution Press, Washington, D. C.

Zeiner, D. C., W.F. Laudenslayer Jr., K. E. Mayer, and M. White, editors. 1990a. California's Wildlife. Volume III: Mammals. California Department of Fish and Game, Sacramento, California.

Zeiner, D. C., W.F. Laudenslayer Jr., K. E. Mayer, and M. White, editors. 1990b. California's Wildlife. Volume II: Birds. California Department of Fish and Game, Sacramento, California.

Attachment A. Figures

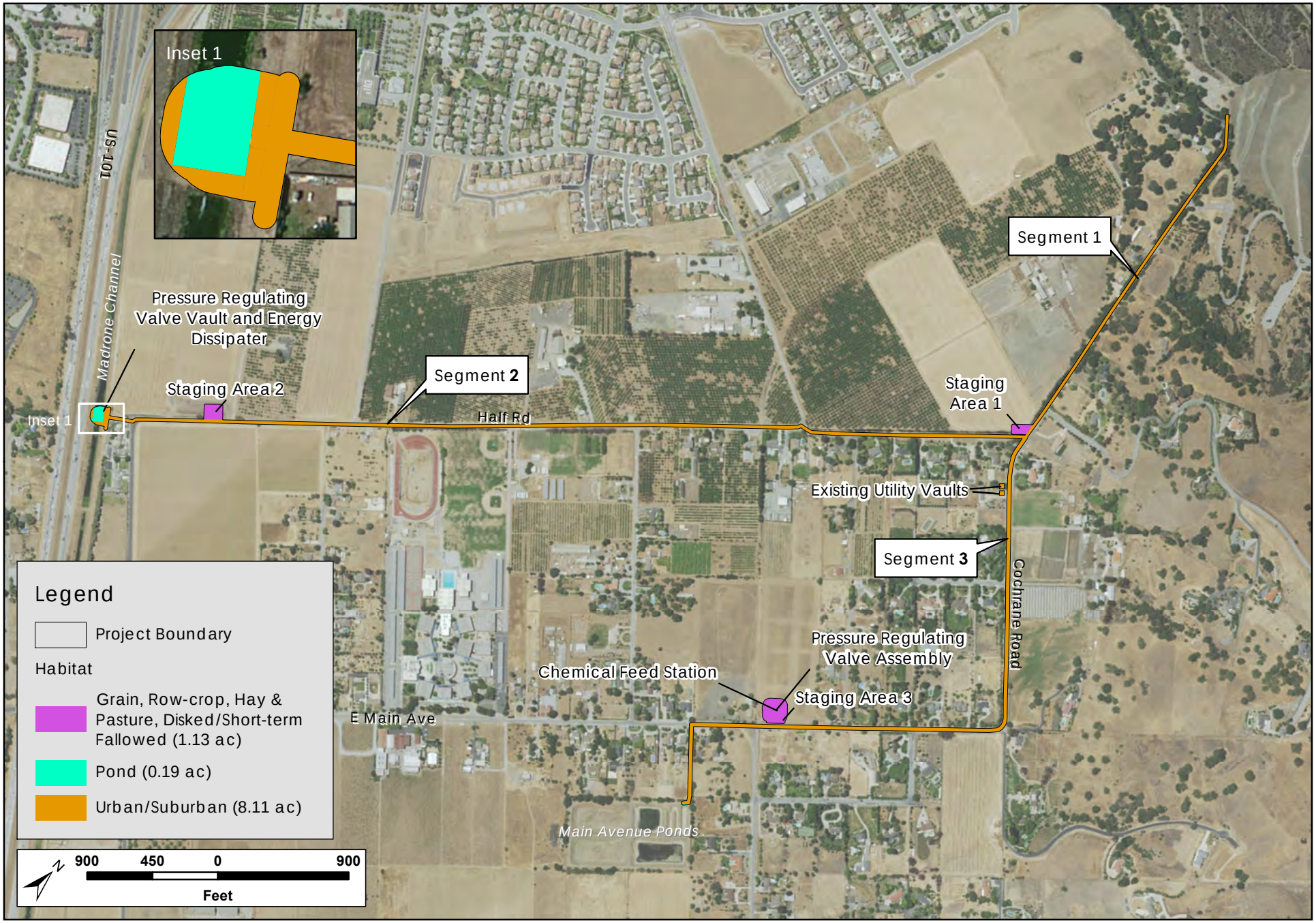


N:\Projects3700\3700-01\13\Reports\Biological Conditions Report\Fig 1 Vicinity Map.mxd

Santa Clara Valley Water District

Figure 1. Vicinity Map

Main Avenue and Madrone Pipelines Restoration Project
Biological Resources Report (3700-13)
October 2016



N:\Projects3700\3700-01\13\Reports\Biological Conditions Report\Fig 2 Alternative 1 Habitat Land Use Map.mxd

Santa Clara Valley Water District

Figure 2. Habitat/Land Use Map

Main Avenue and Madrone Pipelines Restoration Project
Biological Resources Report (3700-13)
October 2016

LEGEND

Project Site

5-mile Radius

CNDDB Records

Plants

Specific Location

Approximate Location

General Area

Terrestrial Communities

General Area

N 1.2 0.6 0 1.2

Miles

N:\Projects\3700\3700-01113\Reports\Biological Conditions Report\Fig 3 CNDDB Plant Records.mxd

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Santa Clara Valley Water District

Figure 3. CNDDB Plant Records

Main Avenue and Madrone Pipelines Restoration Project

Biological Resources Report (3700-13)

October 2016

LEGEND

- Project Site
- 5-mile Radius
- Critical Habitat for Bay Checkerspot Butterfly
- Critical Habitat for California Red-Legged Frog
- Critical Habitat for California Tiger Salamander

CNDDB Records

Animals

- **Specific Location**
- **Approximate Location**
- **General Area**

N 1.2 0.6 0 1.2
Miles

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

N:\Projects\3700\3700-01\13\Reports\Biological Conditions Report\Fig 4 CNDDB Animal Records.mxd

Santa Clara Valley Water District

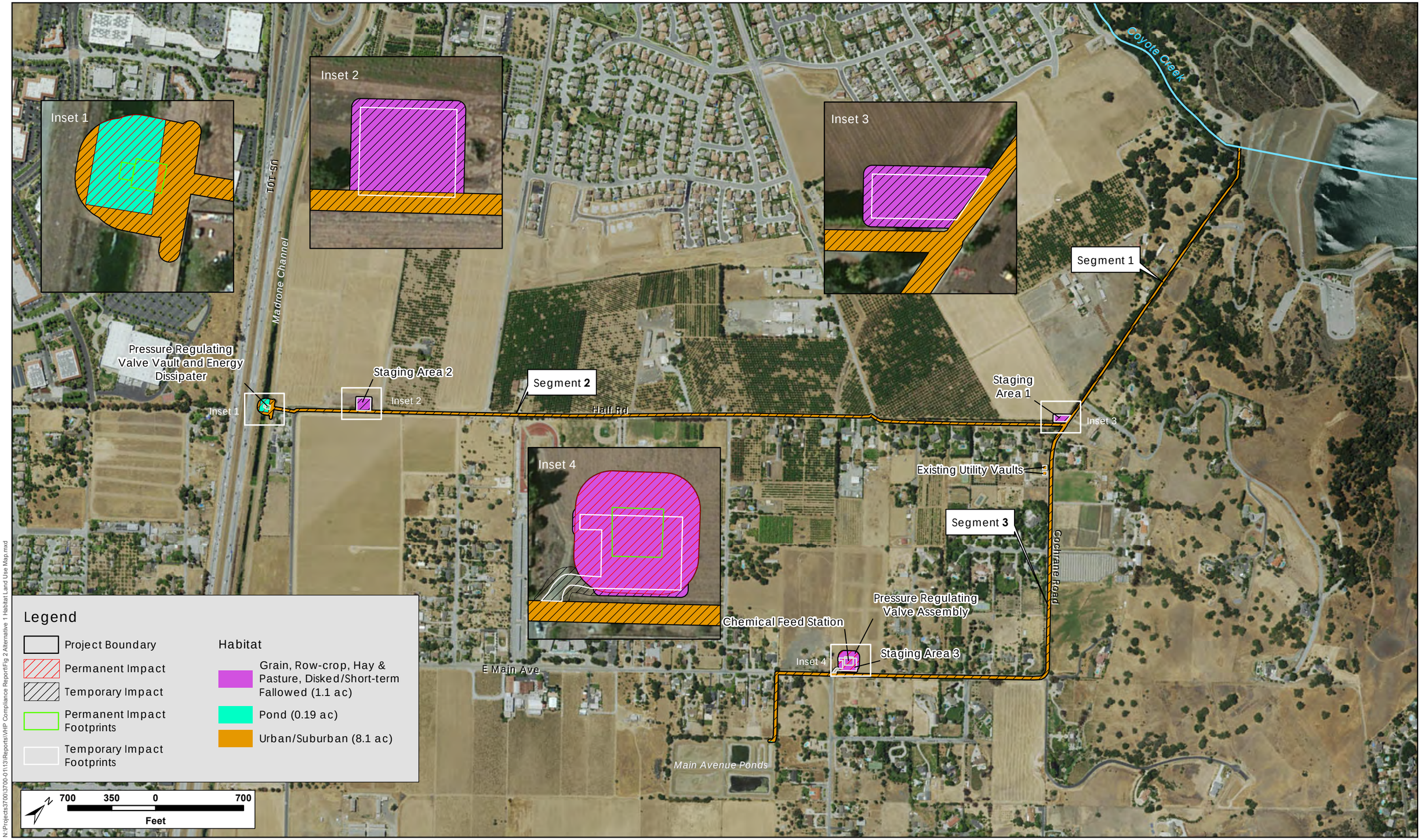
Figure 4. CNDDB Animal Records

Main Avenue and Madrone Pipelines Restoration Project

Biological Resources Report (3700-13)
October 2016

Santa Clara Valley Water District

Figure **5**. Land Use Fee Zones
Main Avenue and Madrone Pipelines Restoration Project
Biological Resources Report (3700-13)
October 2016



N:\Projects3700\3700-01\13\Reports\VHP Compliance Report\Fig 2 Alternative 1 Habitat Land Use Map.mxd

Santa Clara Valley Water District

Figure **6**. Habitat **Impacts** Map
Main Avenue and Madrone Pipelines Restoration Project
Biological Resources Report (3700-13)
October 2016

Attachment B. Best Management Practices

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
Air Quality		
AQ-1	Use Dust Control Measures	The following Bay Area Air Quality Management District (BAAQMD) Dust Control Measures will be implemented: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day; 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered; 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited; 4. Water used to wash the various exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, etc.) will not be allowed to enter waterways; 5. All vehicle speeds on unpaved roads shall be limited to 15 mph; 6. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used; 7. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations), and this requirement shall be clearly communicated to construction workers (such as verbiage in contracts and clear signage at all access points); 8. All construction equipment shall be maintained and properly tuned in accordance with manufacturer‘s specifications, and all equipment shall be checked by a certified visible emissions evaluator; 9. Correct tire inflation shall be maintained in accordance with manufacturer‘s specifications on wheeled equipment and vehicles to prevent excessive rolling resistance; and, 10. Post a publicly visible sign with a telephone number and contact person at the lead agency to address dust complaints; any complaints shall be responded to and take corrective action within 48 hours. In addition, a BAAQMD telephone number with any applicable regulations will be included.
AQ-2	Avoid Stockpiling Odorous Materials	Materials with decaying organic material, or other potentially odorous materials, will be handled in a manner that avoids impacting residential areas and other sensitive receptors, including: 1. Avoid stockpiling potentially odorous materials within 1,000 feet of residential areas or other odor sensitive land uses; and 2. Odorous stockpiles will be disposed of at an appropriate landfill.
Biological Resources		
BI-1	Nesting birds are protected by state and federal laws.	The District will protect nesting birds and their nests from abandonment, loss, damage, or destruction. Nesting bird surveys will be performed by a qualified biologist prior to any activity that

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		could result in the abandonment, loss, damage, or destruction of birds, bird nests, or nesting migratory birds. Inactive bird nests may be removed with the exception of raptor nests. Birds, nests with eggs, or nests with hatchlings will be left undisturbed.
BI-2	Avoid Animal Entry and Entrapment	All pipes, hoses, or similar structures less than 12 inches diameter will be closed or covered to prevent animal entry. All construction pipes, culverts, or similar structures, greater than 2-inches diameter, stored at a construction site overnight, will be inspected thoroughly for wildlife by a qualified biologist or properly trained construction personnel before the pipe is buried, capped, used, or moved. If inspection indicates presence of sensitive or state- or federally-listed species inside stored materials or equipment, work on those materials will cease until a qualified biologist determines the appropriate course of action. To prevent entrapment of animals, all excavations, steep-walled holes or trenches more than 6-inches deep will be secured against animal entry at the close of each day. Any of the following measures may be employed, depending on the size of the hole and method feasibility: 1. Hole to be securely covered (no gaps) with plywood, or similar materials, at the close of each working day, or any time the opening will be left unattended for more than one hour; or 2. In the absence of covers, the excavation will be provided with escape ramps constructed of earth or untreated wood, sloped no steeper than 2:1, and located no farther than 15 feet apart; or In situations where escape ramps are infeasible, the hole or trench will be surrounded by filter fabric fencing or a similar barrier with the bottom edge buried to prevent entry.
BI-3	Minimize Predator-Attraction	Remove trash daily from the worksite to avoid attracting potential predators to the site.
Cultural Resources		
CU-1	Accidental Discovery of Archaeological Artifacts or Burial Remains	If historical or unique archaeological artifacts are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Work at the location of the find will halt immediately within 30 feet of the find. A “no work” zone shall be established utilizing appropriate flagging to delineate the boundary of this zone. A Consulting Archaeologist will visit the discovery site as soon as practicable for identification and evaluation pursuant to Section 21083.2 of the Public Resources Code and Section 15126.4 of the California Code of Regulations. If the archaeologist determines that the artifact is not significant, construction may resume. If the archaeologist determines that the artifact is significant, the archaeologist will determine if the artifact can be avoided and, if so, will detail avoidance procedures. If the artifact cannot be avoided, the archaeologist will develop within 48 hours an Action Plan which will include provisions to minimize impacts and, if required, a Data Recovery Plan for recovery of artifacts in accordance with Public Resources Code Section 21083.2 and Section 15126.4 of the CEQA Guidelines.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		If burial finds are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Upon discovering any burial site as evidenced by human skeletal remains, the County Coroner will be immediately notified and the field crew supervisor shall take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent. No further excavation or disturbance within 30 feet of the site or any nearby area reasonably suspected to overlie adjacent remains may be made except as authorized by the County Coroner, California Native American Heritage Commission, and/or the County Coordinator of Indian Affairs.
Hazards and Hazardous Materials		
HM-1	Restrict Vehicle and Equipment Cleaning to Appropriate Locations	Vehicles and equipment may be washed only at approved areas. No washing of vehicles or equipment will occur at job sites.
HM-2	Ensure Proper Vehicle and Equipment Fueling and Maintenance	No fueling or servicing will be done in a waterway or immediate flood plain, unless equipment stationed in these locations is not readily relocated (i.e., pumps, generators). 1. For stationary equipment that must be fueled or serviced on-site, containment will be provided in such a manner that any accidental spill will not be able to come in direct contact with soil, surface water, or the storm drainage system. 2. All fueling or servicing done at the job site will provide containment to the degree that any spill will be unable to enter any waterway or damage riparian vegetation. 3. All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will be prevented. 4. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Maintenance, repairs, or other necessary actions will be taken to prevent or repair leaks, prior to use. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be done in a channel or flood plain.
HM-3	Utilize Spill Prevention Measures	Prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water following these measures: 1. Field personnel will be appropriately trained in spill prevention, hazardous material control, and clean up of accidental spills; 2. Equipment and materials for cleanup of spills will be available on site, and spills and leaks will be cleaned up immediately and disposed of according to applicable regulatory requirements; 3. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means;

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		4. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations), and all field personnel will be advised of these locations; and, 5. The work site will be routinely inspected to verify that spill prevention and response measures are properly implemented and maintained.
HM-5	Incorporate Fire Prevention Measures	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. An extinguisher shall be available at the project site at all times when welding or other repair activities that can generate sparks (such as metal grinding) is occurring. Smoking shall be prohibited except in designated staging areas and at least 20 feet from any combustible chemicals or vegetation.
Hydrology and Water Quality		
WQ-1	Conduct Work from the Top of Bank	For work activities that will occur in the channel, work will be conducted from the top of the bank if access is available and there are flows in the channel.
WQ-2	Limit Impacts From Staging and Stockpiling Materials	1. To protect on-site vegetation and water quality, staging areas should occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation. Similarly, all equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. 2. Building materials and other project-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains. 3. No runoff from the staging areas may be allowed to enter water ways, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, swale, hay wattles or bales, silt screens). 4. The discharge of decant water to water ways from any on-site temporary sediment stockpile or storage areas is prohibited. 5. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control. During the dry season; exposed, dry stockpiles will be watered, enclosed, covered, or sprayed with non-toxic soil stabilizers.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
WQ-3	Stabilize Construction Entrances and Exits	Measures will be implemented to minimize soil from being tracked onto streets near work sites: 1. Methods used to prevent mud from being tracked out of work sites onto roadways include installing a layer of geotextile mat, followed by a 4-inch thick layer of 1 to 3-inch diameter gravel on unsurfaced access roads. Access will be provided as close to the work area as possible, using existing ramps where available and planning work site access so as to minimize disturbance to the water body bed and banks, and the surrounding land uses.
WQ-4	Use Seeding for Erosion Control, Weed Suppression, and Site Improvement	Disturbed areas shall be seeded with native seed as soon as is appropriate after activities are complete. An erosion control seed mix will be applied to exposed soils down to the ordinary high water mark in streams. 1. The seed mix should consist of California native grasses, (for example *Hordeum brachyantherum*; *Elymus glaucus*; and annual *Vulpia microstachyes*) or annual, sterile hybrid seed mix (e.g., Regreen™, a wheat x wheatgrass hybrid). 2. Temporary earthen access roads may be seeded when site and horticultural conditions are suitable, or have other appropriate erosion control measures in place.
WQ-5	Maintain Clean Conditions at Work Sites	The work site, areas adjacent to the work site, and access roads will be maintained in an orderly condition, free and clear from debris and discarded materials on a daily basis. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust into storm drains or waterways. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged. Any materials and equipment left on the site overnight will be stored to avoid erosion, leaks, or other potential impacts to water quality Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the work site.
WQ-6	Prevent Water Pollution	Oily, greasy, or sediment laden substances or other material that originate from the project operations and may degrade the quality of surface water or adversely affect aquatic life, fish, or wildlife will not be allowed to enter, or be placed where they may later enter, any waterway. The project will not increase the turbidity of any watercourse flowing past the construction site by taking all necessary precautions to limit the increase in turbidity as follows: 1. where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases will not exceed 5 percent; 2. where natural turbidity is greater than 50 NTU, increases will not exceed 10 percent; 3. where the receiving water body is a dry creek bed or storm drain, waters in excess of 50 NTU will not be discharged from the project.

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
		Water turbidity changes will be monitored. The discharge water measurements will be made at the point where the discharge water exits the water control system for tidal sites and 100 feet downstream of the discharge point for non-tidal sites. Natural watercourse turbidity measurements will be made in the receiving water 100 feet upstream of the discharge site. Natural watercourse turbidity measurements will be made prior to initiation of project discharges, preferably at least 2 days prior to commencement of operations.
WQ-8	Prevent Stormwater Pollution	To prevent stormwater pollution, the applicable measures from the following list will be implemented: 1. Soils exposed due to project activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality protected prior to significant rainfall. In creeks, the channel bed and areas below the Ordinary High Water Mark are exempt from this BMP. 2. The preference for erosion control fabrics will be to consist of natural fibers; however, steeper slopes and areas that are highly erodible may require more structured erosion control methods. No non-porous fabric will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would be impacted by the application. 3. Erosion control measures will be installed according to manufacturer's specifications. 4. To prevent stormwater pollution, the appropriate measures from, but not limited to, the following list will be implemented: • Silt Fences • Straw Bale Barriers • Brush or Rock Filters • Storm Drain Inlet Protection • Sediment Traps or Sediment Basins • Erosion Control Blankets and/or Mats • Soil Stabilization (i.e. tackified straw with seed, jute or geotextile blankets, etc.) • Straw mulch. 5. All temporary construction-related erosion control methods shall be removed at the completion of the project (e.g. silt fences). 6. Surface barrier applications installed as a method of animal conflict management, such as chain link fencing, woven geotextiles, and other similar materials, will be installed no longer than 300 feet, with at least an equal amount of open area prior to another linear installation.
WQ-9	Manage Sanitary and Septic	Temporary sanitary facilities will be located on jobs that last multiple days, in compliance with California Division of Occupational Safety and Health (Cal/OSHA) regulation 8 California Code of

BEST MANAGEMENT PRACTICES		
Number	**Title**	**Description**
	Waste	Regulations 1526. All temporary sanitary facilities will be located where overflow or spillage will not enter a watercourse directly (overbank) or indirectly (through a storm drain).
Traffic and Transportation		
TR-1	Incorporate Public Safety Measures	Fences, barriers, lights, flagging, guards, and signs will be installed as determined appropriate by the public agency having jurisdiction, to give adequate warning to the public of the construction and of any dangerous condition to be encountered as a result thereof.
SANTA CLARA VALLEY HABITAT PLAN CONDITIONS		
Condition 1	Avoid Direct Impacts on Legally Protected Plant and Wildlife Species	Compliance with Condition 1 within the project area would necessitate avoiding take of nesting birds protected by the Migratory Bird Treaty Act and/or California Fish and Game Code either by implementing repairs during the non-breeding season (September 1 to January 31) or by conducting preconstruction surveys and maintaining appropriate buffers around active nests that contain eggs or young as noted on pages 6-7 and 6-8 of the VHP.
Condition 3	Maintain Hydrologic Conditions and Protect Water Quality	Compliance with Condition 3 necessitates implementing the measures listed in Chapter 6 (Table 6-2) of the Santa Clara Valley Habitat Plan. These measures are BMPs to protect water quality and avoid other adverse effects, such as source and treatment control measures to prevent pollutants from leaving the construction site and minimizing site erosion and local sedimentation during construction. Many of these measures overlap or are similar to the District's BMPs.
Condition 12	Wetland and Pond Avoidance	Compliance with Condition 12 helps to minimize impacts on wetlands and ponds and avoid impacts on high quality wetlands and ponds by prescribing vegetated stormwater filtration features, proper disposal of cleaning materials, and other requirements. The Project will be required to implement the avoidance and minimization measures listed in Chapter 6 on pages 6-56 to 6-58 of the VHP.
Condition 17	Tricolored Blackbird	Condition 17 is to avoid direct impacts of covered activities on nesting tricolored blackbird colonies. This condition in the VHP is required as it is located within 250 feet of a riparian cover type. If a project meets this criterion, a qualified biologist is required to conduct a field investigation to identify and map potential nesting substrate as described on pages 6-70 and 6-71 of the VHP. Nesting substrate includes flooded, thorny, or spiny vegetation.

Attachment C. Overview of Federal, State, and Local Regulations and Policies Applicable to Proposed Project

Attachment C
Overview of Federal, State, and Local Regulations and Policies Applicable to the Proposed Project

Law, Regulation, or Policy	Overview
Federal Endangered Species Act (FESA)	The FESA (16 U.S. Government Code (USC) Sec. 1531 *et seq*.) protects fish and wildlife species that are listed as threatened or endangered and their habitats. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction in all or a significant portion of their range. *Threatened* refers to species, subspecies, or distinct population segments that are considered likely to become endangered in the future. The FESA is administered by the USFWS for terrestrial and freshwater species and by the National Oceanographic and Atmospheric Administration's NMFS for marine species and anadromous fishes. The FESA prohibits "take" of any fish or wildlife species listed by the federal government as endangered or threatened. (*Take* is defined as harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capture, or collection, or the attempt to engage in any such conduct.) The FESA also prohibits removing, digging up, cutting, or maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. However, Section 10(a)(1)(B) of the FESA establishes a process through which a "nonfederal entity" (a business or individual) can apply for a permit allowing take of federally listed species under certain, restricted circumstances. To be permissible under Section 10(a)(1)(B), take must occur as a corollary of otherwise lawful activities, and may not be the purpose of the activities; this is referred to as *incidental take*. Permits authorizing incidental take are issued by the USFWS and/or NMFS, depending on the species involved. A key requirement for issuance of a permit under Section 10(a)(1)(B) is preparation of an HCP that fully analyzes the effects of the proposed take and describes the measures that will be taken to avoid, minimize, and compensate for it. A parallel process authorizing incidental take associated with activities undertaken or permitted by federal agencies is established by FESA Section 7. **Santa Clara Valley Habitat Plan. T**he Valley Habitat Plan (VHP) provides a means by which covered projects can obtain incidental take approval under the Federal Endangered Species Act for selected species and provide mitigation for impacts to resources regulated by other laws, such as the Clean Water Act and California Fish and Game Code. The VHP has been approved and adopted by the six local partners (Cities of Gilroy, Morgan Hill, and San Jose, County of Santa Clara, Santa Clara Valley Transportation Authority, and Santa Clara Valley Water District). The VHP is intended to provide an effective framework to protect, enhance, and restore natural resources in specific areas of Santa Clara County, while improving and streamlining the environmental permitting process for impacts on threatened and endangered species. A number of plant and animal species are covered by the VHP. Approval of impacts on covered species from project activities covered by the VHP (i.e., projects that meet a number of criteria concerning location, proponent, and type) will be considerably expedited. Fees paid in accordance with the extent and nature of projects' impacts are used to further conservation efforts via the acquisition, creation, or enhancement, as well as the preservation and management, of habitat for these species. In addition, covered projects are subject to a number of measures concerning avoidance and minimization of impacts on covered species and habitats through project design and construction measures (such as preconstruction species surveys and seasonal restrictions on construction activities) to directly protect species.

Fish and Wildlife Coordination Act	Originally passed in 1934, and substantively amended in following decades, the Fish and Wildlife Coordination Act includes a wide range of provisions relative to the importance of the nation's waters as a fish and wildlife resource. As originally passed, the Act empowered the Secretaries of Agriculture and Commerce to assist federal and state agencies in activities related to the supply of economically important (game and fur-bearing) animals, including protection, rearing, and stocking. The original Act also authorized the completion of wildlife surveys of public lands and preparation of plans to protect wildlife resources, as well as directing the establishment of fish-culture stations and migratory bird resting and nesting areas, and studies of the effects of various pollutants on wildlife. Important amendments enacted in 1946 require consultation with USFWS and state fish and wildlife agencies regarding any project that has a federal component and would impound, divert, or otherwise control or modify the waters of any stream or other water body. The purpose of consultation is identified as "preventing loss of and damage to wildlife resources." Further amendments in 1958 clarified and reinforced the consultation requirement by adding language recognizing the vital contribution of the nation's wildlife resources and a stipulation that wildlife conservation must receive equal consideration alongside other water resources development needs. The 1958 amendments also expanded the types of diversions and modifications for which consultation is required.
Federal Migratory Bird Treaty Act (MBTA)	The MBTA (16 USC Sec. 703–712 *et seq*.) enacted the provisions of treaties between the United States, Great Britain, Mexico, Japan, and the Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate take of migratory birds. The MBTA is administered by USFWS. It establishes seasons and bag limits for hunted species, and renders taking, possession, import, export, transport, sale, purchase, and barter of migratory birds, their occupied nests, and their eggs illegal except where authorized under the terms of a valid federal permit. Activities for which permits may be issued include scientific collecting; falconry and raptor propagation; "special purposes," which include rehabilitation, education, migratory game bird propagation, and miscellaneous other activities; control of depredating birds; taxidermy; and waterfowl sale and disposal. More than 800 species of birds are protected under the MBTA. Specific definitions of *migratory bird* are discussed in each of the international treaties; in general, however, species protected under the MBTA are those that migrate to complete different stages of their life history or to take advantage of different habitat opportunities during different seasons.
Federal Bald and Golden Eagle Protection Act	The Bald and Golden Eagle Protection Act (16 USC Sec. 668 *et seq*.) makes it unlawful to import, export, take, sell, purchase, or barter any bald eagle or golden eagle, or their parts, products, nests, or eggs. *Take* includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbance. Exceptions may be granted by the USFWS for scientific or exhibition use, or for traditional and cultural use by Native Americans. However, no permits may be issued for import, export, or commercial activities involving eagles.

California Endangered Species Act (CESA)

CESA protects wildlife and plants listed as *threatened* and *endangered* by the California Fish and Game Commission, as well as species identified as candidates for such listing. It is administered by the CDFW. CESA requires state agencies to conserve threatened and endangered species (Sec. 2055) and thus restricts all persons from taking listed species except under certain circumstances. CESA defines *take* as any action or attempt to "hunt, pursue, catch, capture, or kill." Under certain circumstances, CDFW may authorize limited take, except for species designated as *fully protected* (see discussion of fully protected species under *California Fish and Game Code* below). The requirements for an application for an incidental take permit under CESA are described in Section 2081 of the California Fish and Game Code and in final adopted regulations for implementing Sections 2080 and 2081.

Santa Clara Valley Habitat Plan. The VHP provides a means by which covered projects can obtain incidental take approval under the California Endangered Species Acts. The VHP has been approved and adopted by the six local partners (Cities of Gilroy, Morgan Hill, and San Jose, County of Santa Clara, Santa Clara Valley Transportation Authority, and Santa Clara Valley Water District). The VHP is intended to provide an effective framework to protect, enhance, and restore natural resources in specific areas of Santa Clara County, while improving and streamlining the environmental permitting process for impacts on threatened and endangered species. A number of plant and animal species are covered by the VHP. Approval of impacts on covered species from project activities covered by the VHP (i.e., projects that meet a number of criteria concerning location, proponent, and type) will be considerably expedited. Fees paid in accordance with the extent and nature of projects' impacts are used to further conservation efforts via the acquisition, creation, or enhancement, as well as the preservation and management, of habitat for these species. In addition, covered projects are subject to a number of measures concerning avoidance and minimization of impacts on covered species and habitats through project design and construction measures (such as preconstruction species surveys and seasonal restrictions on construction activities) to directly protect species.

California Native Plant Protection Act (CNPPA)

The CNPPA was enacted to preserve, protect, and enhance endangered and rare plants in California. It specifically prohibits the importation, take, possession, or sale of any native plant designated by the California Fish and Game Commission as rare or endangered, except under specific circumstances identified in the Act. Various activities are exempt from CNPPA, although take as a result of these activities may require other authorization from CDFW under the California Fish and Game Code.

California Fish and Game Code

The California Fish and Game Code provides protection from take for a variety of species, separate from and in addition to the protection afforded under CESA. The Code defines *take* as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Species identified in the Code as *fully protected* may not be taken except for scientific research. Fully protected species are listed in various sections of the Code. For instance, fully protected birds in general are protected under Section 3511, nesting birds under Sections 3503.5 and 3513, and eggs and nests of all birds under Section 3503. Birds of prey are addressed under Section 3503.5. All other birds that occur naturally in California and are not resident game birds, migratory game birds, or fully protected birds are considered *non-game birds* and are protected

	under Section 3800. Section 3515 lists protected fish species and Section 5050 lists protected amphibians and reptiles. Section 4700 identifies fully protected mammals.
Santa Clara County Tree Ordinance	Santa Clara County Code (Division C16) Tree Preservation and Removal regulations protect trees on property owned or leased by the County of Santa Clara and which measures over 37.7 inches in circumference (12 inches or more in diameter) measured 4.5 ft above the ground, or which exceeds 20 ft in height. Removal of protected trees requires an administrative permit from the County. The permit requires mitigation for removed trees by replacement planting on or off site at a mitigation ratio determined by the County Planning Department. The Santa Clara County Tree Ordinance is applicable only to unincorporated areas of the County; within city limits, it is superseded by the city tree ordinance, if one exists.
City of Morgan Hill Tree Ordinance	The City of Morgan Hill, in section 12.32.030 of the Municipal Code, defines the Tree Removal Permit Process required prior to the removal by cutting down, poisoning, killing, destroying, or otherwise the removal of any tree or community of trees as follows – existing trees rising above the ground with a single stem or trunk of a circumference of 40 inches or more for nonindigenous species and 18 inches or more for indigenous species (native to Morgan Hill region, including oaks, California bay, madrone, sycamore, and alder) measured at four and one-half feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes (all commercial tree farms, nonindigenous species in residential zones, and orchards (including individual fruit trees) are exempted; or trees of any size within the public right-of-way; or trees that are important to the historical or visual aspect of Morgan Hill. To remove any trees that meet the above conditions, a tree removal permit must be secured from the City of Morgan Hill. The application for a tree removal permit must include: diameter and height of tree, type of tree, map of location of tree, method of marking the tree, description of method used to remove the tree, description of tree planting or replacement program, reason proposed for removing the tree, address where tree is located, general health of tree to be removed, and any other pertinent information that the community development director may require.

Attachment D. Special-Status Plants Considered for Potential Occurrence but Rejected

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Federal and State Listed				
Tiburon paintbrush	*Castilleja affinis* var. *neglecta*	FE, ST, CRPR 1B.2, VHP	Serpentinite in valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils.
Coyote ceanothus	*Ceanothus ferrisiae*	FE, CRPR 1B.1, VHP	Serpentinite in chaparral, coastal scrub, valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils.
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	FT, CRPR 1B.2	Sandy areas in maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland	Species considered absent due to a lack of suitably sandy soils.
Santa Clara Valley dudleya	*Dudleya abramsii* ssp. *setchellii*	FE, CRPR 1B.1, VHP	Rocky serpentinite in cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils or rock outcrops.
Tracy's eriastrum	*Eriastrum tracyi*	SR, CRPR 3.2	Chaparral, Cismontane woodland	Species considered absent due to a lack of suitable chaparral or cismontane woodland habitat.
Contra Costa goldfields	*Lasthenia conjugens*	FE, CRPR 1B.1	Mesic areas in cismontane woodland, alkaline playas, valley and foothill grassland, vernal pools	Species considered absent due to a lack of suitable vernal pool or alkaline wetland habitat.
Rock sanicle	*Sanicula saxatilis*	SR, CRPR 1B.2	Rocky areas or talus slopes in broadleafed upland forest, chaparral, valley and foothill grassland	Species considered absent due to a lack of suitable talus slopes or rock outcrops; additionally, the site is outside the species' known elevation range.
Metcalf Canyon jewel-flower	*Streptanthus albidus* ssp. *albidus*	FE, CRPR 1B.1, VHP	Serpentinite in valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Two-fork clover	*Trifolium amoenum*	FE, CRPR 1B.1	Coastal bluff scrub and valley and foothill grassland, moist, heavy soils, sometimes associated with serpentine	Species considered absent due to a lack of serpentine-derived soils, moist areas of heavy clay soils, or suitable coastal bluff scrub.
California Native Plant Society Ranked Plant Species				
Santa Clara thorn-mint	*Acanthomintha lanceolata*	CRPR 4.2	Rocky areas in cismontane woodland, coastal scrub, and often serpentinite chaparral	Species considered absent due to a lack of suitable serpentine chaparral, coastal scrub, or cismontane woodland habitat.
Bent-flowered fiddleneck	*Amsinckia lunaris*	CRPR 1B.2	Coastal bluff scrub, openings in cismontane woodland, valley and foothill grassland, often serpentine	Species considered absent due to a lack of serpentine-derived soils and extent of disturbance.
California androsace	*Androsace elongata* ssp. *acuta*	CRPR 4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland	Species considered absent due to a lack of suitable habitats and extent of disturbance within the Project site.
Anderson's manzanita	*Arctostaphylos andersonii*	CRPR 1B.2	Openings and edges in broadleafed upland forest, chaparral, North Coast coniferous forest	Species considered absent due to a lack of suitable habitats and extent of disturbance within the Project site, no manzanita shrubs observed during reconnaissance surveys.
Big-scale balsamroot	*Balsamorhiza macrolepis*	CRPR 1B.2	Sometimes serpentinite in chaparral, cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils and extent of disturbance within the Project site.
Round-leaved filaree	*California macrophylla*	CRPR 1B.2	Heavy clay soils in cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of suitable heavy clay soils and extent of disturbance within the Project site.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Oakland star-tulip	*Calochortus umbellatus*	CRPR 4.2	Often serpentinite in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland	Species considered absent due to a lack of serpentine-derived soils and extent of disturbance within the Project site.
Santa Cruz Mountains pussypaws	*Calyptridium parryi* var. *hesseae*	CRPR 1B.1	Sandy or gravelly openings in chaparral, cismontane woodland	Species considered absent due to a lack of suitable sandy soils or chaparral or cismontane woodland habitats.
South Coast Range morning-glory	*Calystegia collina* ssp. *venusta*	CRPR 4.3	Serpentinite or sedimentary geology in chaparral, cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine soils or chaparral or cismontane woodland habitats.
Chaparral harebell	*Campanula exigua*	CRPR 1B.2	Rocky, usually serpentinite chaparral	Species considered absent due to a lack of suitable serpentine soils or chaparral habitats.
Pink creamsacs	*Castilleja rubicundula* var. *rubicundula*	CRPR 1B.2	Serpentinite in chaparral openings, cismontane woodland, meadows and seeps, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine soils, seeps, or chaparral or cismontane woodland habitats.
Douglas' spineflower	*Chorizanthe douglasii*	CRPR 4.3	Sand or gravel areas in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland	Species considered absent due to a lack of suitably undeveloped soils trending towards sand or gravel, additionally Project site is too disturbed to support the species.
Mt. Hamilton fountain thistle	*Cirsium fontinale* var. *campylon*	CRPR 1B.2, VHP	Serpentinite seeps in chaparral, cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine or seep habitat.
Brewer's clarkia	*Clarkia breweri*	CRPR 4.2	Often serpentinite areas in chaparral, cismontane woodland, coastal scrub	Species considered absent due to a lack of suitable serpentine soils, chaparral, coastal scrub, or cismontane woodland habitats.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Santa Clara red ribbons	*Clarkia concinna* ssp. *automixa*	CRPR 4.3	Chaparral, cismontane woodland	Species considered absent due to a lack of suitable chaparral or cismontane woodland habitats.
San Francisco collinsia	*Collinsia multicolor*	CRPR 1B.2	Sometimes serpentinite areas in closed-cone coniferous forest, coastal scrub	Species considered absent due to a lack of suitable serpentine soils, or closed-cone coniferous forest or coastal scrub habitats.
Rattan's cryptantha	*Cryptantha rattanii*	CRPR 4.3	Rocky or gravelly slopes in cismontane woodland, riparian forest, and valley and foothill grassland	Species considered absent due to a lack of suitable woodland or riparian habitat, and extent of disturbance within the Project site. Additionally, this species is not known to occur in Santa Clara County.
Clustered lady's-slipper	*Cypripedium fasciculatum*	CRPR 4.2	Usually serpentinite seeps and streambanks in lower montane coniferous forest, North Coast coniferous forest	Species considered absent due to a lack of suitable serpentine soils, seeps, streambanks, or North Coast or montane coniferous forest habitats.
Hospital Canyon larkspur	*Delphinium californicum* ssp. *setchellii*	CRPR 1B.2	Mesic openings in chaparral, cismontane woodland, and coastal scrub	Species considered absent due to a lack of suitable mesic habitats, chaparral, cismontane woodland, or coastal scrub habitats.
California bottle-brush grass	*Elymus californicus*	CRPR 4.3	Riparian woodlands in broadleafed upland forest, North coast coniferous forest, or cismontane woodland habitat	Species considered absent due to a lack of riparian habitat; additionally this species is restricted to coastal areas and has never been detected as far inland as the Project site.
Hoover's button-celery	*Eryngium aristulatum* var. *hooveri*	CRPR 1B.1	Vernal pools	Species considered absent due to a lack of vernal pools.
Fragrant fritillary	*Fritillaria liliacea*	CRPR 1B.2, VHP	Often serpentinite areas in cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine soils, or cismontane woodland, coastal prairie, or coastal scrub habitats.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Phlox-leaf serpentine bedstraw	*Galium andrewsii* ssp. *gatense*	CRPR 4.2	Serpentinite and rocky areas in chaparral, cismontane woodland, lower montane coniferous forest	Species considered absent due to a lack of suitable serpentine soils, or cismontane woodland, chaparral, or lower montane coniferous forest habitats.
Serpentine sunflower	*Helianthus exilis*	CRPR 4.2	Serpentinite seeps in chaparral, cismontane woodland	Species considered absent due to a lack of suitable serpentine soils or seeps, or cismontane woodland or chaparral habitats.
Loma Prieta hoita	*Hoita strobilina*	CRPR 1B.1, VHP	Usually in serpentinite and mesic areas in chaparral, cismontane woodland, riparian woodland	Species considered absent due to a lack of suitable serpentine soils or mesic areas, and a lack of cismontane woodland, chaparral, or riparian habitats.
Coast iris	*Iris longipetala*	CRPR 4.2	Mesic areas in coastal prairie, lower montane coniferous forest, meadows and seeps	Species considered absent due to a lack of suitable mesic sites such as meadows or seeps, or lower montane coniferous forest or coastal prairie habitats.
Legenere	*Legenere limosa*	CRPR 1B.1	Wet areas such as vernal pools and ponds.	Species considered absent due to a lack of vernal pools or suitable pond habitat. The perc ponds at the terminus of the Project site are actively controlled for vegetation and have too steep and barren sides to be expected to support this species.
Bristly leptosiphon	*Leptosiphon acicularis*	CRPR 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland	Species considered absent due to a lack of chaparral and cismontane habitats, as well as the extent of disturbance within grassy areas of the Project site.
Serpentine leptosiphon	*Leptosiphon ambiguus*	CRPR 4.2	Usually serpentinite areas in cismontane woodland, coastal scrub, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine soils, and a lack of cismontane woodland or coastal scrub habitats.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Large-flowered leptosiphon	*Leptosiphon grandiflorus*	CRPR 4.2	Usually sandy areas in coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland	Species considered absent due to a lack of suitably sandy soils, and a lack of coastal bluff scrub, coastal dunes, closed-cone coniferous forest, coastal prairie, or coastal scrub habitats.
Mt. Hamilton coreopsis	*Leptosyne hamiltonii*	CRPR 1B.2	Rocky areas in cismontane woodland	Species considered absent due to a lack of suitable cismontane woodland habitat or rock outcrops or talus.
Woolly-headed lessingia	*Lessingia hololeuca*	CRPR 3	Clay or serpentinite soils in broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland	Species considered absent due to a lack of suitable serpentine soils, and a lack of forest or coastal scrub habitats.
Smooth lessingia	*Lessingia micradenia* var. *glabrata*	CRPR 1B.2, VHP	Serpentinite areas and often roadsides in chaparral, cismontane woodland	Species considered absent due to a lack of suitable serpentine soils, and a lack of cismontane woodland or chaparral habitats.
Spring lessingia	*Lessingia tenuis*	CRPR 4.3	Openings in chaparral, cismontane woodland, lower montane coniferous forest	Species considered absent due to a lack of cismontane woodland, lower montane coniferous forest, or chaparral habitats.
Mt. Hamilton lomatium	*Lomatium observatorium*	CRPR 1B.2	Cismontane woodland	Species considered absent due to a lack of cismontane woodland habitats.
Showy golden madia	*Madia radiata*	CRPR 1B.1	Generally clayey or shale-derived soils in cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of shale soils or cismontane woodland habitats. Additionally, the site is considered too disturbed to support the species.
Arcuate bush-mallow	*Malacothamnus arcuatus*	CRPR 1B.2	Chaparral, cismontane woodland	Species considered absent due to a lack of cismontane woodland or chaparral habitats

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Hall's bush-mallow	*Malacothamnus hallii*	CRPR 1B.2	Chaparral, coastal scrub	Species considered absent due to a lack of cismontane woodland or coastal scrub habitats.
Oregon meconella	*Meconella oregana*	CRPR 1B.1	Shaded canyons in coastal prairie and coastal scrub	Species considered absent due to a lack of shaded canyons, or coastal prairie or coastal scrub habitats.
Mt. Diablo cottonweed	*Micropus amphibolus*	CRPR 3.2	Rocky, shallow, exposed soils and sometimes serpentine areas in broadleafed upland forest, mixed evergreen forest, chaparral, cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of appropriate exposed or shallow soils, rock outcrops, or serpentine soils. Additionally, most habitats known to support the species are entirely absent from the Project site, and grassy areas on the site are disturbed and edaphically unsuitable.
Woodland woolythreads	*Monolopia gracilens*	CRPR 1B.2	Serpentine areas in broadleafed upland forest openings, chaparral openings, cismontane woodland, North Coast coniferous forest openings, Valley and foothill grassland	Species considered absent due to a lack of serpentine soils, forest openings, or cismontane woodland habitat.
Santa Cruz Mountains beardtongue	*Penstemon rattanii* var. *kleei*	CRPR 1B.2	Chaparral, lower montane coniferous forest, North Coast coniferous forest	Species considered absent due to a lack of chaparral, or lower montane or North Coast coniferous forest habitats.
San Benito pentachaeta	*Pentachaeta exilis* ssp. *aeolica*	1B.2	Cismontane woodland and valley and foothill grassland	Species considered absent due to a lack of cismontane woodland habitats, and grassy areas within the Project site are too disturbed to be reasonably expected to support the species.
Mt. Diablo phacelia	*Phacelia phacelioides*	CRPR 1B.2	Rocky areas in chaparral, cismontane woodland	Species considered absent due to a lack of rock outcrops or chaparral or cismontane woodland habitats.
Hairless popcorn-flower	*Plagiobothrys glaber*	CRPR 1A	Alkaline meadows and seeps, coastal salt marshes and swamps	Species considered absent due to a lack of suitably mesic meadows, seeps, or swamps or coastal salt marsh habitats.

Special-Status Plants Considered for Potential Occurrence but Rejected

Common Name	Scientific Name	Regulatory Status	Habitat	Potential for Occurrence on the Project Site
Warty popcorn-flower	*Plagiobothrys verrucosus*	CRPR 2B.1	Shale soils in chaparral	Species considered absent due to a lack of shale soils or chaparral habitats.
Chaparral ragwort	*Senecio aphanactis*	CRPR 2B.2	Sometimes in alkaline soils in chaparral, cismontane woodland, coastal scrub	Species considered absent due to a lack of alkaline soils or suitable chaparral, cismontane woodland, or coastal scrub habitat.
Maple-leaved checkerbloom	*Sidalcea malachroides*	CRPR 4.2	Often in disturbed areas in broadleafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland	Species considered absent due to a lack of forest, coastal scrub, coastal prairie, or riparian woodland habitat.
Most beautiful jewel-flower	*Streptanthus albidus* ssp. *peramoenus*	CRPR 1B.2, VHP	Serpentinite areas in chaparral, cismontane woodland, valley and foothill grassland	Species considered absent due to a lack of serpentine soils and chaparral or cismontane woodland habitat.
Mt. Hamilton jewel-flower	*Streptanthus callistus*	CRPR 1B.3	Chaparral and cismontane woodland habitat in the Mt. Hamilton Range	Species considered absent due to a lack of chaparral or cismontane woodland habitat.
Santa Cruz clover	*Trifolium buckwestiorum*	CRPR 1B.1	In gravelly soils or margins along broadleafed upland forest, cismontane woodland, coastal prairie	Species considered absent due to a lack of broadleafed upland forest, cismontane woodland, or coastal prairie habitat.

Attachment E. Detailed Descriptions of Special-Status Animal Species Potentially Occurring on the Project Site

Federal and State Endangered and Threatened Species

California Tiger Salamander (*Ambystoma californiense*). Federal Listing Status: Threatened (Central Population); State Listing Status: Threatened; VHP Status: Covered. The range of the California tiger salamander is restricted to the Central Valley and the South Coast Range of California, from Butte County south to Santa Barbara County. The tiger salamander has disappeared from a significant portion of its range due to habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators. This species was listed as threatened in August 2004 (USFWS 2004), and critical habitat was designated in August 2005 (USFWS 2005). No critical habitat for the California tiger salamander occurs within or adjacent to the Project site; the nearest critical habitat unit (Unit 7, also known as the San Felipe Creek Unit) is located north of Morgan Hill 4.4 mi to the north of the Project site.

Suitable breeding habitat for California tiger salamanders consists of temporarily ponded environments (e.g., vernal pool, ephemeral pool, or human-made pond) that hold water for a minimum of 3–4 months and are surrounded by uplands that support small mammal burrows. California tiger salamanders will also utilize permanent ponds if aquatic vertebrate predators are not present. Suitable ponds provide breeding and larval habitat, while burrows of small mammals such as California ground squirrels and Botta's pocket gophers in upland habitats provide refugia for juvenile and adult salamanders during the dry season.

Although larvae develop in the pools and ponds in which they were born, the species is otherwise terrestrial, spending most of its post-metamorphic life in widely dispersed, underground retreats (Trenham 2001). Adults are rarely encountered, even where they are known to be abundant, spending most of the year in or near upland refugia (Storer 1925, Barry and Shaffer 1994, Shaffer and Trenham 2005). Seasonal migration of adults to pools and ponds occurs only for the purposes of breeding. Most studies of upland habitat use by California tiger salamanders suggest that most individuals do not travel far from breeding ponds. Trenham and Shaffer (2005) estimated that 50, 90, and 95% of adult California tiger salamanders were within 492, 1,608, and 2,034 ft of their study pond, respectively, and that 95% of juvenile California tiger salamanders were within 2,067 ft of the pond, with 85% concentrated between 656 and 1,969 ft, but none were found at 2,625 ft. Trenham et al. (2001) observed a high probability of adult California tiger salamanders dispersing between pools up to 2,198 ft apart but did not observe dispersal events longer than 2,297 ft. However, Austin and Shaffer (1992) reported dispersal distances by California tiger salamanders of at least 1.0 mi, and Orloff (2007) reported longer-distance dispersal by a few individuals in a population in Pittsburgh, Contra Costa County. Orloff's results suggested that some individuals might travel up to 1.3 mi or more from aquatic breeding habitat to upland aestivation habitat. Collectively, these studies suggest that dispersal distances may vary among populations and/or

sites; that California tiger salamander abundance likely decreases with increasing distance from a breeding pond; and that a few individuals may disperse 1 mi or more from breeding areas.

The hydrology of the Main Avenue Ponds is suitable for breeding by California tiger salamanders (H. T. Harvey & Associates 2012b), although the VHP does not map these ponds as suitable breeding habitat for this species (ICF International 2012). In 2010, a desiccated juvenile tiger salamander was found by District biologists in the bottom of one of the Main Avenue Ponds after it had dried out (H. T. Harvey & Associates 2012b). It is possible that this finding indicates that tiger salamanders are breeding in the Main Avenue ponds, or that they occasionally disperse here. However, larval surveys of the ponds in 2012 and 2014 did not detect any individuals of this species (H. T. Harvey & Associates 2012b, 2014), and thus there is no evidence that tiger salamanders breed in these ponds regularly or in recent years. Additional records of California tiger salamanders in the site vicinity are a nonbreeding record at Almaden Lake County Park approximately 1.3 mi to the northeast, and a breeding record at Rosendin Pond approximately 1.0 mi to the northeast (CNDDB 2016). The species may also breed in a small pond off Cochrane Road near the Anderson Lake County Park entrance. Due to the distances between the Main Avenue Ponds and other known/potential breeding ponds in the area, as well as the obstacles to dispersal posed by development (i.e., agricultural fields, residences, and roads) in between these records and the Main Avenue Ponds, it is unlikely that California tiger salamanders disperse (at least regularly and in numbers) between these other locations and the Main Avenue Ponds. Nevertheless, due to the observation of a juvenile tiger salamander in the Main Avenue Ponds and the possibility of dispersal by tiger salamanders through the moderate-density residential development and agricultural areas surrounding these ponds, it is possible that individuals occasionally occur at the Main Avenue site, and that these ponds might occasionally support breeding by California tiger salamanders (H. T. Harvey & Associates 2012b).

Ponded areas within the Madrone Channel provide ostensibly suitable breeding habitat for California tiger salamanders. The closest record of a California tiger salamander to the Madrone Channel is from the Main Avenue Ponds located approximately 0.5 mi to the southeast (described above). However, the openness of the vineyards and agricultural fields between the Main Avenue Ponds and Madrone Channel (coupled with the paucity of rodent burrows within these intensively cultivated land uses) reduces the likelihood that tiger salamanders, if present at the Main Avenue Ponds, would disperse to the Madrone Channel (H. T. Harvey & Associates 2012b). Additional records of California tiger salamander near the Madrone Channel are the breeding record at Rosendin Pond and the nonbreeding record at Almaden Lake County Park (CNDDB 2016). However, both locations are more than 1.4 mi east of the Madrone Channel and are separated from the channel by roads, residential development, and intensive agriculture that collectively would preclude California tiger salamanders from dispersing to the Madrone Channel. Thus, California tiger salamanders are determined to be absent from the Madrone Channel.

The VHP maps upland areas of the Project site as suitable upland dispersal and refugial habitat for California tiger salamanders. No burrows were observed on the Project site that would provide suitable refugia for California tiger salamanders during the 2016 site survey, although several

burrows were observed in the site vicinity. Based on records of California tiger salamanders breeding at Almaden Lake County Park, this species is most likely to occur within the northernmost portion of the Project site along Cochrane Road, especially during rain events when individuals disperse between upland refugia and breeding areas. It is not expected to occur in the Project area as far west as Staging Area 3.

California Red-legged Frog (*Rana draytonii*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern; VHP Status: Covered. The historical distribution of California red-legged frogs extended from the city of Redding in the Central Valley and Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002). The California red-legged frog was listed as threatened in June 1996 (USFWS 1996) based largely on a significant range reduction and continued threats to surviving populations (Miller 1994). Revised critical habitat was designated in March 2010 (USFWS 2010). Critical habitat for red-legged frogs does not overlap with the Project site, but Unit STC-1 is located immediately northeast of Anderson Reservoir (USFWS 2010).

California red-legged frogs inhabit perennial freshwater pools, streams, and ponds throughout the Central California Coast Range as well as isolated portions of the western slopes of the Sierra Nevada (Fellers 2005). Their preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Nonbreeding frogs may be found adjacent to streams and ponds in grasslands and woodlands, and may travel up to 2 mi from their breeding locations across a variety of upland habitats (Bulger et al. 2003, Fellers and Kleeman 2007).

The Main Avenue Ponds and ponded areas of the Madrone Channel provide ostensibly suitable breeding habitat for California red-legged frogs in most years, and the Main Avenue Ponds are mapped as suitable breeding habitat for this species by the VHP (ICF International 2012). However, aquatic surveys of the Main Avenue Ponds in 2012 and 2014 did not detect any individuals of this species (H. T. Harvey & Associates 2012b, 2014). The nearest known breeding records of red-legged frogs is approximately 2.8 mi northeast of the Madrone Channel and 2.5 mi northeast of the Main Avenue Ponds on the far side of Anderson Reservoir (CNDDB 2016). In addition, California red-legged frogs likely breed in Rosendin Pond, approximately 1.7 mi northeast of the Madrone Channel and 1.0 mi northeast of the Main Avenue Ponds, based on multi-year observations of juveniles at the pond (S. Rottenborn, pers. obs.), and may breed in perennial ponds at Anderson Reservoir below the spillway, as well as a small pond off of Cochrane Road 265 ft east of the Project site at the Anderson Reservoir park entrance. However, California red-legged frogs are not expected to disperse from these locations to the Project site due to the highly disturbed agricultural habitat and roadways present in between these areas. Thus, California red-legged frogs are determined to be absent from the Main Avenue Ponds and Madrone Channel.

The VHP maps upland areas of the Project site as suitable upland dispersal and refugial habitat for California red-legged frogs (ICF International 2012). Based on known occurrences of California red-legged frogs at Almaden Lake County Park, this species may occur on the Project site during dispersal to and from breeding ponds. It is most likely to occur within the northernmost portion of the Project site along Cochrane Road, especially during rain events when individuals disperse between upland refugia and breeding areas.

Tricolored Blackbird (*Agelaius tricolor*). Federal Listing Status: None; State Listing Status: California Species of Special Concern; VHP Status: Covered. Tricolored blackbirds are found primarily in the Central Valley and in central and southern coastal areas of California. This species was recently listed as Endangered in California due to concerns over the loss of wetland habitats in the state and observed population declines. The tricolored blackbird is highly colonial in its nesting habits, and forms dense nesting colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails (*Typha* spp.) or tules (*Schoenoplectus* spp.), but also nests in blackberry (*Rubus ursinus*), wild rose (*Rosa californica*) bushes, and tall herbs. Nesting colonies are usually located near fresh water. Tricolored blackbirds form large, often multi-species flocks during the nonbreeding period and range more widely than during the nesting season.

The VHP maps potentially suitable nesting habitat for tricolored blackbirds in the Main Avenue Ponds. However, no suitable habitat to support a nesting colony of this species was observed in the Main Avenue Ponds or the Madrone Channel during the 2016 site survey. No nesting colonies are known from the Project site or its vicinity, and nesting colonies are determined to be absent. Individuals may forage throughout the site in small numbers during the nonbreeding season, although no high-quality foraging habitat is present.

California Species of Special Concern

Western Pond Turtle (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern; VHP Status: Covered. Western pond turtles occur in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano 2008). The central California population was historically present in most drainages on the Pacific slope (Jennings and Hayes 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines throughout most of the species' range (Stebbins 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mi from aquatic habitats (Jennings and Hayes 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 ft of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by adults may travel overland considerable distances to nest.

The VHP maps the Main Avenue Ponds as primary habitat for pond turtles, and surrounding agricultural areas as secondary habitat, but does not map the Madrone Channel as habitat for pond turtles (ICF International 2012). Western pond turtles are not known to occur in the Main Avenue Ponds or the Madrone Channel, and focused surveys of these habitats in 2012 did not detect the species (H. T. Harvey & Associates 2012a). These survey results suggest that the Main Avenue Ponds and Madrone Channel are not currently being used by western pond turtles. Nevertheless, the nearest known record of western pond turtles is 1.1 mi to the northeast of the Main Avenue Ponds and 1.6 mi to the northeast of the Madrone Channel at Anderson Reservoir (CNDDB 2016), and it is possible that individual pond turtles could potentially disperse to the site from this location. However, given the isolation of the Main Avenue Ponds and Madrone Channel from records of the species at Anderson Reservoir by cultivated agricultural areas, residences, and roadways, the lack of dispersal corridor between these areas, and reduced aquatic productivity of the ponds in both locations, pond turtles are unlikely to occur in either location and the Project site is not expected to support a population of the species.

Burrowing Owl (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Special Concern; VHP Status: Covered. The burrowing owl is a small, terrestrial owl of open country. This species prefers annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels; owls use the abandoned burrows of ground squirrels for shelter and nesting. The nesting season, as recognized by the CDFW (CDFG 2012), runs from February 1 through August 31. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows, or they may migrate (Rosenberg et al. 2007); young birds disperse across the landscape from 0.1 mi to 35 mi from their natal burrows (Rosier et al. 2006).

Burrowing owls were present in the Coyote Valley, Morgan Hill, and Evergreen areas into the late 1990s, but they have been infrequently recorded in either area in recent years (Trulio 2007). The species still occasionally is recorded in Coyote Valley and in grasslands at higher elevations, such as on Coyote Ridge, but seems to occur in such areas only during the nonbreeding season. Recent surveys for breeding burrowing owls conducted for the VHP (Albion Environmental 2008) found no owls breeding in southern Santa Clara County. There are no other recent (i.e., post-2000) breeding records from the Morgan Hill/San Martin area in the CNDDB (2016) or in eBird (Cornell Lab of Ornithology 2016). However, small numbers of burrowing owls are still recorded in the vicinity (e.g., on Coyote Ridge or northern Coyote Valley) during the nonbreeding season (CNDDB 2016, Cornell Lab of Ornithology 2016). Thus, although burrowing owls nested in southern Santa Clara County historically, they are currently known to occur there only as scarce nonbreeders.

The VHP maps portions of the Project area as potential burrowing owl nesting/overwintering habitat depending on site-specific conditions (ICF International 2012). No burrows of California ground squirrels were observed on the Project site to provide potential roosting habitat for this species, but several suitable burrows were observed near the site (i.e., within 250 feet) during the 2016 site visit. However, the vegetated habitat on the site is too limited to provide suitable foraging

habitat. Further, burrowing owls have not been recorded on or adjacent to the Project site (CNDDB 2016, Cornell Lab of Ornithology 2016, S. Rottenborn pers. obs.), and no owls or evidence of owls was observed during Project surveys. Thus, this species is not expected to occur on the Project site at all.

American Badger (*Taxidea taxus*). Federal Listing Status: none; State Listing Status: Species of Special Concern; VHP Status: Not a Covered Species. American badgers are highly specialized fossorial (adapted for burrowing or digging) mammals that occur in grassland habitats throughout California, except in the northwestern corner of the state (Zeiner et al. 1990a). They can have large territories of up to 21,000 ac, with territory size varying by sex and season. In central California, American badgers typically occur in annual grasslands, oak woodland savannas, semi-arid shrub/scrublands, and any habitats with friable soils and stable prey populations (e.g., ground squirrels, gophers, kangaroo rats, and chipmunks; Zeiner et al. 1990a). They occur to a lesser extent in agricultural areas, where intensive cultivation inhibits den establishment and reduces prey abundance.

Badgers are strong diggers, digging burrows both in pursuit of prey and to create dens for cover and raising of young. They are primarily nocturnal, although they are often active during the day. Badgers breed during late summer, and females give birth to a litter of young the following spring.

Badgers are not expected to den on the Project site due to high levels of human disturbance along roadways and from District maintenance activities at the Madrone Channel and Main Avenue Ponds, or to occur on the site regularly or in numbers. However, badgers may occasionally disperse through the site.

Pallid Bat (*Antrozous pallidus*). Federal Listing Status: None; State Listing Status: Species of Special Concern; VHP Status: Not a Covered Species. The pallid bat occurs throughout California with the exception of the northwest corner of the state and the high Sierra Nevada (Zeiner et al. 1990a). Pallid bats are most commonly found in oak savannah and other open dry habitats with rocky areas, trees, buildings, or bridge structures that are used for roosting (Zeiner et al. 1990a, Ferguson and Azerrad 2004). Coastal colonies commonly roost in deep crevices in rocky outcroppings; in buildings; under bridges; and in the crevices, hollows, and exfoliating bark of trees. Night roosts often occur in open buildings, porches, garages, highway bridges, and mines. Colonies can range in size from a few individuals to over a hundred (Barbour and Davis 1969), and usually consist of at least 20 individuals (Wilson and Ruff 1999). Pallid bats typically winter in canyon bottoms and riparian areas. After mating during the late fall and winter, females leave to form maternity colonies, often on ridge tops or other warmer locales (Johnston et al. 2006). Pallid bats will forage for miles surrounding a maternity colony. Pallid bat roosts are very susceptible to human disturbance, and urban development has been cited as the most significant factor contributing to their regional decline (Miner and Stokes 2005).

No suitable roosting habitat for pallid bats occurs on the Project site. However, H. T. Harvey & Associates biologists have periodically monitored a maternity colony of pallid bats located in a

barn southwest of Cochrane Road near the base of Anderson Dam approximately 60 ft from the Project site since 1998. This barn regularly supports approximately 80-85 females, which use the roost year-round (including as a maternity roost in spring and summer). Given the presence of these females, an equivalent number of males are expected to occur in the vicinity. This population of 160-170 individuals represents the largest known pallid bat population in Santa Clara County, and whereas most other pallid bat colonies in the county have declined since 1998, this population has remained relatively stable over three surveys (in 1998, 2006, and 2012). Individuals from this colony could potentially forage on the Project site in open areas. A second old barn, located approximately 25 ft from the Project site along East Main Avenue, also provides potential roosting habitat for this species, although whether pallid bats occur at this additional location is unknown.

State Fully Protected Species

White-tailed Kite (*Elanus leucurus*). Federal Listing Status: None; State Listing Status: Fully Protected; VHP Status: Not a Covered Species. In California, white-tailed kites can be found in the Central Valley and along the coast in grasslands, agricultural fields, cismontane woodlands, and other open habitats (Zeiner et al. 1990b, Dunk 1995, Erichsen et al. 1996). White-tailed kites are year-round residents of the state, establishing nesting territories that encompass open areas with healthy prey populations and snags, shrubs, trees, or other substrates for nesting (Dunk 1995). Nonbreeding birds typically remain in the same area over the winter, although some movements do occur (Polite 1990). The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles, and prey base may be the most important factor in determining habitat quality for white-tailed kites (Dunk and Cooper 1994, Skonieczny and Dunk 1997).

White-tailed kites are common residents in the Project region where open grassland, ruderal, or agricultural habitats are present. No nests of white-tailed kites were detected in trees adjacent to the Project site during the 2016 survey. Nevertheless, trees in the site vicinity provide suitable sites for nesting by up to one pair of white-tailed kites, especially along Cochrane Road near Anderson Lake County Park, and this species may forage in open habitats throughout the Project site year-round.

APPENDIX C
Noise Impact Analysis

NOISE IMPACT ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL
COUNTY OF SANTA CLARA, CALIFORNIA

LSA

September 2016

NOISE IMPACT ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL
COUNTY OF SANTA CLARA, CALIFORNIA

Prepared for:

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Prepared by:

LSA Associates, Inc.
5084 N. Fruit Avenue Suite 103
Fresno, CA 93711
(559) 490-1210

LSA

September 2016

TABLE OF CONTENTS

FIGURES AND TABLES

FIGURES

TABLES

NOISE IMPACT ANALYSIS

A. INTRODUCTION

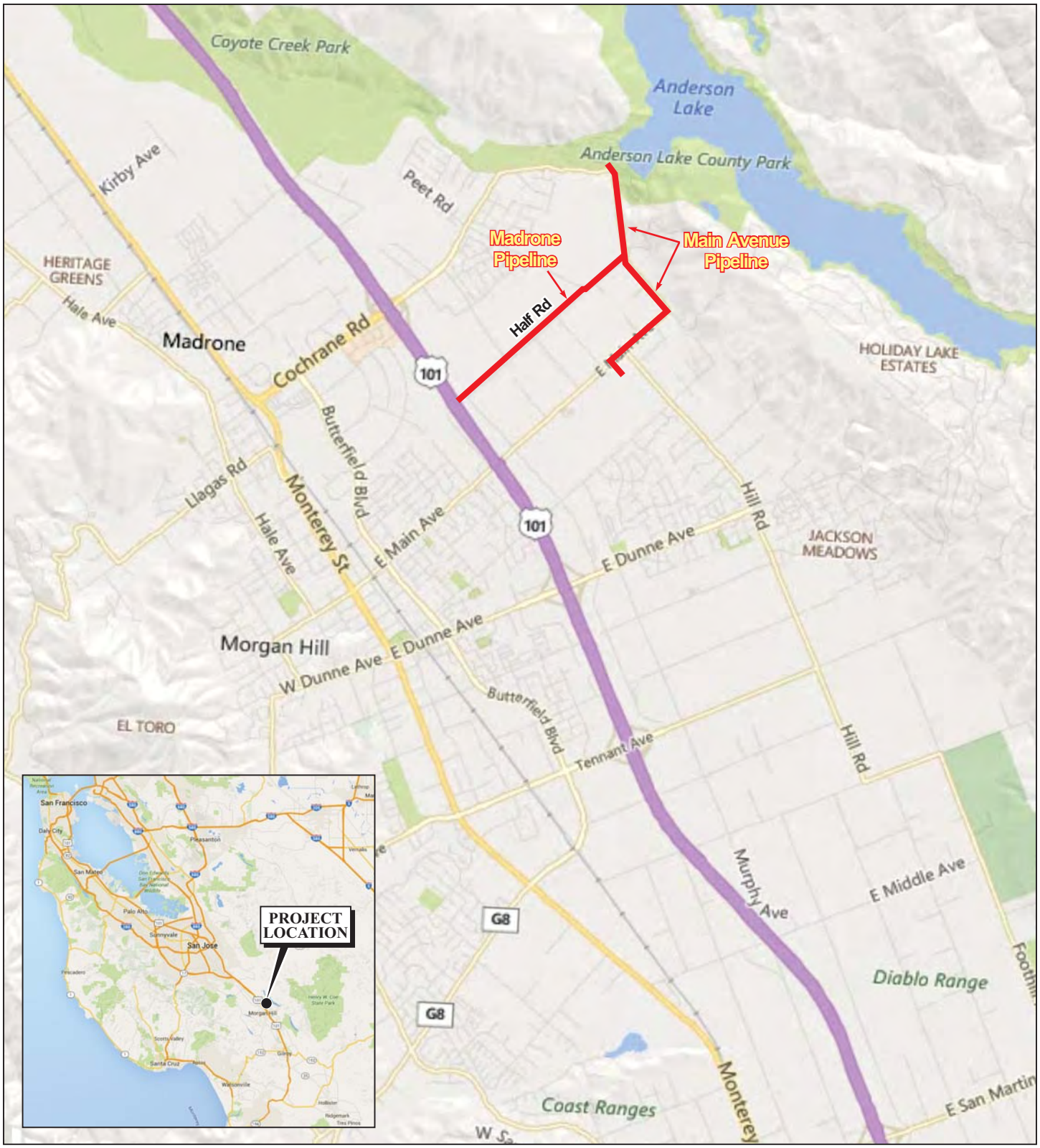
This technical noise impact analysis has been prepared to evaluate the potential construction noise impacts and mitigation measures associated with the proposed Santa Clara Valley Water District (District) Main Avenue and Madrone Pipeline Restoration Project (project) in the City of Morgan Hill (City) in Santa Clara County (County), California. The project is primarily located within the City's urban limit line, while some portions are located outside the urban limit line but within the City's sphere of influence. This report examines the impact of the proposed project on adjacent noise-sensitive uses and evaluates measures to reduce potentially significant construction noise impacts. Two different alignment options are under consideration. Both options require the same construction activities and are located the same distance from the nearest sensitive receptors. The analysis in this report is therefore presented as a summary of the potential noise effects of both options. The project location and a detailed vicinity map are shown in Figure 1. Alignment Options 1 and 2 are shown in Figures 2 and 3, respectively.

B. PROJECT DESCRIPTION

The proposed project would restore the Main Avenue and Madrone pipelines in an area that lies partially within the City of Morgan Hill and partially in an unincorporated area of Santa Clara County bordering the City and within the City's sphere of influence. Surrounding uses include low-density residential and agricultural, as well as a high school with buildings located approximately 1,000 feet from sections of the project. The project site is generally bound to the southwest by US Highway 101 (US 101), and to all other directions by agricultural land interspersed with low-density residential developments.

Construction is expected to begin July 2017 and require 17 months for completion. The proposed project would be fully operational November 2018. Construction phases would include demolition, excavation and fill, pipeline installation, and pavement restoration, with several of the phases likely occurring simultaneously during portions of the project. The demolition phase would include the demolition and removal of existing asphalt, pipelines and a 100 square foot chemical feed station. Excavation and fill would use the open-trench method and would require the removal of approximately 153,300 cubic yards of soil and replacement with approximately 2,900 cubic yards of pipeline, 3,400 cubic yards of imported bedding, and 146,700 cubic yards of backfill, leaving 6,300 cubic yards to be exported to the nearest landfill. Approximately 13,960 feet of 30 to 36 inch diameter pipeline would be installed. Asphalt would be restored and a new chemical feed station would be constructed closer to Main Avenue Ponds.

Two alignment options are under consideration. Both alignment options would require the same construction activities including pipeline length and excavation volume. Alignment Option 1 and Alignment Option 2 are shown in Figures 2 and 3, respectively.



LSA

FIGURE 1

N

0 2000 4000

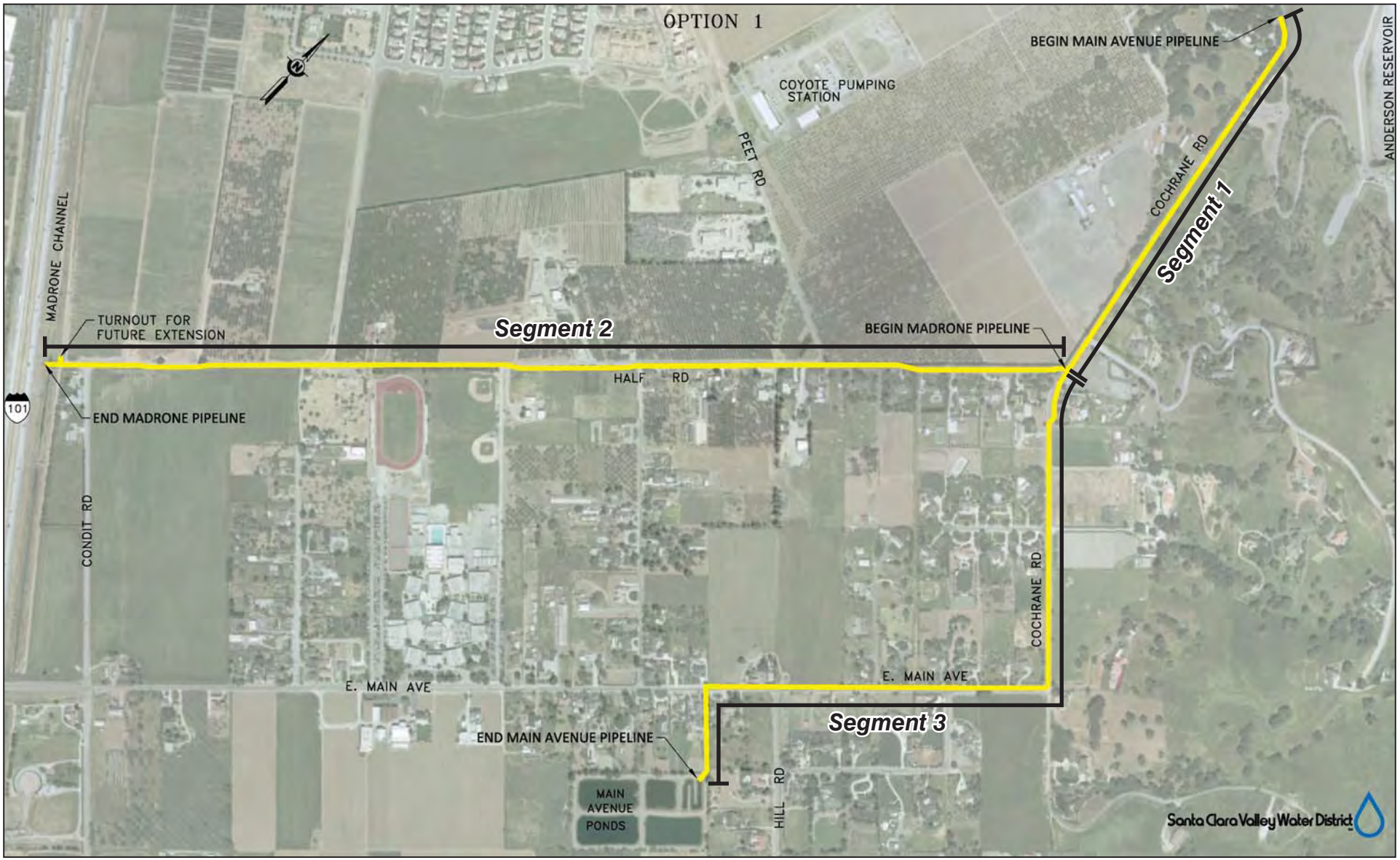
FEET

SOURCE: Bing Maps

Main Avenue and Madrone Pipeline Restoration Project

Project Location and Regional Vicinity Map

I:\SWD1501\G\Project Location.cdr (5/24/2016)



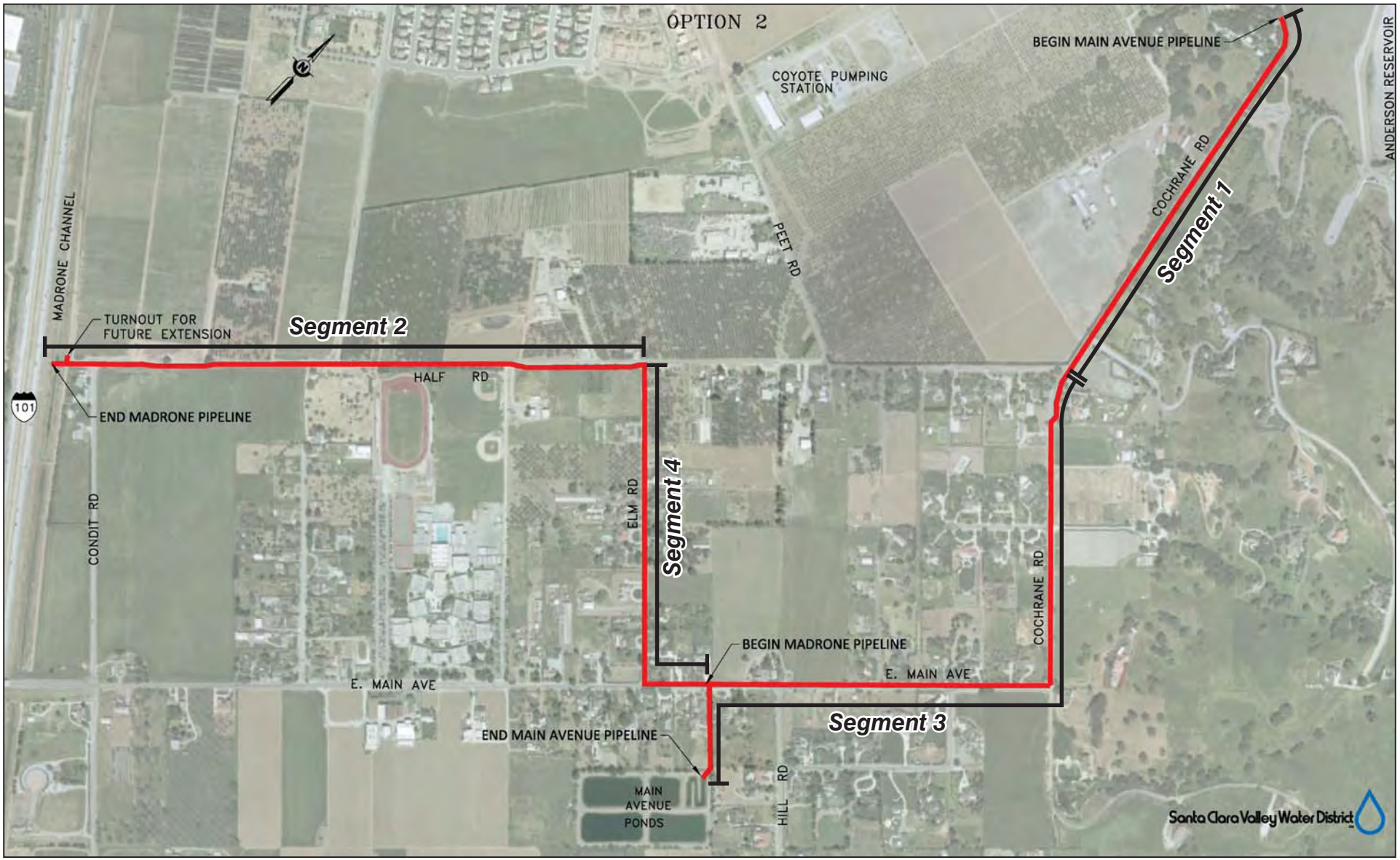
LSA

FIGURE 2

Main Avenue and Madrone Pipeline Restoration Project
Alignment Option 1

SOURCE: Santa Clara Valley Water District

I:\SWD1501\G\Alignment Option 1.cdr (8/24/2016)



LSA

FIGURE 3

Main Avenue and Madrone Pipeline Restoration Project
Alignment Option 2

SOURCE: Santa Clara Valley Water District

I:\SWD1501\G\Alignment Option 2.cdr (8/24/2016)

The pipeline segments are arranged as follows.

- Segment 1 is composed of the 2,800 linear feet (LF) of 16-inch diameter Main Avenue Pipeline from the Anderson Reservoir outlet to the Cochrane and Half Road intersection. Pipeline for Segment 1 would be replaced with 36-inch pipe.
- Segment 2 is composed of the 6,300 LF of 24-inch diameter and 30-inch diameter Main Avenue Pipeline from the Cochrane and Half Road intersection to the Madrone Channel. Pipeline for Segment 2 would be replaced with 30-inch pipe.
- Segment 3 is composed of the remaining 4,860 LF of 16-inch, 18-inch, and 24-inch diameter Madrone Pipeline from the Cochrane and Half Road intersection to the Main Avenue Ponds. Pipeline for Segment 3 would be replaced with 30-inch pipe.
- Segment 4, which is an alternative route for Segment 3 under Alignment Option 2, would be composed of 400 LF of 30-inch diameter pipe running southwest from Main Avenue to the intersection of Elm Road and Main Avenue and approximately 2,100 LF of 30-inch diameter pipe running northwest from Elm Road to Half Road intersection. In total, 2,500 LF of 30-inch diameter pipe would be installed connecting Main Avenue and Half Road via Elm Road.

C. METHODOLOGY RELATED TO NOISE IMPACT ASSESSMENT

Evaluation of noise impacts associated with the proposed project includes a determination of the short-term construction noise impacts on off-site noise-sensitive uses; and a determination of the required mitigation measures to reduce significant off-site noise and vibration impacts. The following section describes the characteristics of sound and a description of noise.

1. Characteristics of Sound

Noise is usually 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.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and the project's effect on adjacent sensitive land uses.

2. Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 dB; 20 dB are 100 times more intense than 1 dB; and 30 dB are 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dBA for each doubling of distance in a hard-site environment. Line source (noise in a relatively flat environment with absorptive vegetation) decreases 4.5 dBA for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The City uses the CNEL noise scale for long-term noise impact assessment. The County uses the L_{dn} noise scale for noise compatibility standards for land use in Santa Clara County, while the noise scale used in the County Code of Ordinances is unspecified.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory

environments. The last category includes changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

3. Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure (typically more than 8 hours, as defined by the Occupational Safety and Health Administration [OSHA]) to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions (thereby, affecting blood pressure and functions of the heart and the nervous system). In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dB, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dB, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dB will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

Table 1 lists "Definitions of Acoustical Terms," and Table 2 displays "Common Sound Levels and Their Noise Sources."

Table 1: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10%, 50%, and 90% of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control,* 1991.

Table 2: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environment	Subjective Evaluation
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle a few feet away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/ Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing
	0	Very Faint	

Source: Compiled by LSA Associates, Inc. (2004).

4. Vibration

Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items on shelves or wall hangings, or a low-frequency rumbling noise. The rumble noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Groundborne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). Of these two, RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Ground vibrations from construction activities do not often reach the levels that can damage structures, but they can achieve the audible and tactile ranges in buildings very close to the site. Problems with groundborne vibration from construction sources are usually localized to areas within about 100 feet from the vibration source.

D. EXISTING CONDITIONS

1. Surrounding Land Uses in the Project Vicinity

The proposed project is located partially in the City of Morgan Hill and partially in an unincorporated area bordering the City and within the City's sphere of influence. Existing land uses adjacent to Half Road include agricultural, educational and residential. Recreational facilities of Live Oak High School border the project site along Half Road and buildings are located approximately 1,000 feet away. Single-family residential homes are located adjacent to the proposed project with the nearest building façades located approximately 40 feet from the road. Highway 101 is located at the southwestern end of the project site.

2. Overview of the Existing Noise Environment

Noise contour maps included in shown in of the City of Morgan Hill General Plan indicate that noise levels in the project site vicinity range from 75 dBA to less than 60 dBA L_{dn} with the primary noise source being Highway 101.[1]

3. Thresholds of Significance

A project will normally have a significant effect on the environment related to noise if it will substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the proposed construction activities are the noise criteria listed in the County's and City's Municipal Codes and General Plans.

Based on the standards and thresholds identified, the effects of the proposed project have been categorized as either "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact.

a. County of Santa Clara Noise Ordinance. The County has incorporated the following measures in its Code of Ordinances to control construction noise:[2]

> Chapter VIII. Section B11-154 (b)(6) – Specific Prohibitions – Construction/demolition.
>
> The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:
>
> a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work or public service utilities or by variance.

[1] Morgan Hill, City of, 2010. *Morgan Hill General Plan*. February.

[2] Santa Clara, County of, 2014. *Santa Clara County, California – Code of Ordinances, Chapter VII, Section B11-154 – Prohibited Acts*. May.

b. Where technically and economically feasible, construction activities will be conducted in a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

i. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment:

Table 3: County Maximum Noise Levels for Nonscheduled, Intermittent, Short-term Operation of Mobile Equipment

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area	Commercial Area
Daily, except Sundays and legal holidays, 7:00 a.m.—7:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

Source: Santa Clara, County of, 2014. *Santa Clara County, California – Code of Ordinances, Chapter VII, Section B11-154 – Prohibited Acts.* May

ii. Stationary equipment. Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment are as follows:

Table 4: County Maximum Noise Levels for Repetitively Scheduled and Relatively Long-term Operation of Stationary Equipment

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area	Commercial Area
Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

Source: Santa Clara, County of, 2014. *Santa Clara County, California – Code of Ordinances, Chapter VII, Section B11-154 – Prohibited Acts.* May

It is expected that the majority of construction operations at any one location for the proposed project would be completed in less than ten days. The standards in Table 3 would therefore apply to these operations.

b. County of Santa Clara General Plan. The County addresses noise in the Safety and Noise Element of the General Plan.[3] The Noise Compatibility Standards for Land Use in Santa Clara

[3] Santa Clara, County of, 1994. *Santa Clara County General Plan.* December.

County found in the General Plan apply to long-term, operational noise impacts resulting from development projects and would therefore not be applicable to the proposed project.

c. City of Morgan Hill Municipal Code Noise Ordinance. The City has incorporated the following measures in its Municipal Code to control construction noise[4]:

Section 8.28.040 – Enumeration of unlawful noises. Unlawful noises include:

D.1 Construction activities as limited below. "Construction activities" are defined as including but not limited to excavation, grading, paving, demolition, construction, alteration or repair of any building, site, street or highway, delivery or removal of construction material to a site, or movement of construction materials on a site. Construction activities are prohibited other than between the hours of 7:00 a.m. and 8:00 p.m., Monday through Friday and between the hours of 9:00 a.m. to 6:00 p.m. on Saturday. Construction activities may not occur on Sundays or federal holidays. No third person, including but not limited to landowners, construction company owners, contractors, subcontractors, or employers, shall permit or allow any person working on construction activities which are under their ownership, control or direction to violate this provision. Construction activities may occur in the following cases without violation of this provision.

a. In the event of urgent necessity in the interests of the public health and safety, and then only with a permit from the chief building official, which permit may be granted for a period of not to exceed three days or less while the emergency continues and which permit may be renewed for periods of three days or less while the emergency continues.

b. If the chief building official determines that the public health and safety will not be impaired by the construction activities between the hours of 8:00 p.m. and 7:00 a.m., and that loss or inconvenience would result to any party in interest, the chief building official may grant permission for such work to be done between the hours of 8:00 p.m. and 7:00 a.m. upon an application being made at the time the permit for the work is issued or during the progress of work.

c. The city council finds that construction by the residents of a single residence does not have the same magnitude or frequency of noise impacts as a larger construction project. Therefore, the resident of a single residence may perform construction activities on that home during the hours in this subsection, as well as on Sundays and federal holidays from 9:00 a.m. to 6:00 p.m., provided that such activities are limited to the improvement or maintenance undertaken by the resident on a personal basis.

d. Public work projects are exempt from this section and the public works director shall determine the hours of construction for public works projects.

e. Until November 30, 1998, construction activities shall be permitted between the hours of 10:00 a.m. to 6:00 p.m. on Sundays, subject to the following conditions. No power-driven vehicles, equipment or tools may be used during construction activities, except on the interior of a building or other structure which is enclosed by exterior siding

[4] Morgan Hill, City of, 2016. *Morgan Hill, California – Code of Ordinances, Chapter 8.28-Noise.* April.

(including windows and doors) and roofing, and which windows and doors are closed during construction activities. Construction activities must be situated at least one hundred fifty feet from the nearest occupied dwelling. No delivery or removal of construction material to a site, or movement of construction materials on a site, is permitted. No activity, including but not limited to the playing of radios, tape players, compact disc players or other devices, which creates a loud or unusual noise which offends, disturbs or harasses the peace and quiet of the persons of ordinary sensibilities beyond the confines of the property from which the sound emanates is allowed.

D.2 If it is determined necessary in order to ensure compliance with this section, the chief building official may require fences, gates or other barriers prohibiting access to a construction site by construction crews during hours in which construction is prohibited by this subsection. The project manager of each project shall be responsible for ensuring the fences, gates or barriers are locked and/or in place during hours in which no construction is allowed. This subsection shall apply to construction sites other than public works projects or single dwelling units which are not a part of larger projects.

E. Defective or Loaded Vehicles. The use of any automobile, motorcycle or vehicle so out of repair, so loaded, or in such manner as to create loud and unnecessary grating, grinding, rattling or other noise;

F. Exhausts. The discharge into the open air of exhaust of any steam engine, stationary internal combustion engine, motorboat or motor vehicle except through a muffler or other device which will effectively prevent loud or explosive noises therefrom;

G. Loading or Unloading Vehicles and Opening Boxes. The creation of loud and excessive noise in connection with loading or unloading any vehicles or the opening of destruction of bales, boxes, crates and containers;

I. Noises Adjacent to Schools, Courts, Churches and Hospitals. The creation of any excessive noise on any street adjacent to any school, institution of learning, church or court while the same is in use or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital; provided, conspicuous signs are displayed in such streets indicating that the street is adjacent to a school, hospital or court; and

J. Pile Drivers, Hammers and Similar Equipment. The operation, between the hours of 8:00 p.m. and 7:00 a.m. of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance, the use of which is attended by loud or unusual noise.

d. Morgan Hill General Plan. The City addresses noise in the Public Health and Safety Element of the 2010 General Plan.[5] The following policies are included in the City's General Plan:

- **Policy 7b.** The impact of a proposed development project on existing land uses should be evaluated in terms of the potential for adverse community response based on significant increase in existing noise levels, regardless of compatibility guidelines.
- **Policy 7e.** Noise level increases resulting from traffic associated with new projects shall be considered significant if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level

[5] Morgan Hill, City of, 2010. *Morgan Hill 2030 General Plan.* February.

of less than 60 dBA L_{dn}, or b) the noise level increase is 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater.

- **Policy 7f.** Noise levels produced by stationary noise sources associated with new projects shall be considered significant if they substantially exceed ambient noise levels.

The noise policies found in the City's General Plan apply to long-term, operational noise impacts resulting from development projects and would therefore not be applicable to the proposed project.

e. Vibration. Neither the County nor the City currently has specific vibration impact limits. The County Noise Ordinance prohibits operating or permitting the operation of any device that creates a vibrating or quivering effect that endangers or injures the safety or health of human beings or animals, annoys or disturbs a person of normal sensitivities, or endangers or injures personal or real properties. Because no threshold is specified, the Federal Transit Administration's (FTA) criteria will be used. The FTA includes groundborne vibration and noise impact criteria guidance in its *Transit Noise and Vibration Impact Assessment*, as shown in Table 5. Based on FTA guidance, and depending on the building category of the nearest buildings adjacent to the project site, the potential construction vibration damage criteria vary. The criteria presented in Table 5 account for variation in project types, as well as the frequency of events, which differ widely among transit project. Although the criteria are provided for community response to groundborne vibration form rail rapid transit systems, they also provide useful guidelines for human response to exposure to vibration in general.

Table 5: Groundborne Vibration and Noise Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro inch/sec)		Groundborne Noise Impact Levels (dB re 20 micropascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Category 1: Buildings in which low ambient vibration is essential for interior operations	65 VdB[3]	65 VdB[3]	--[4]	--[4]
Category 2: Residences and buildings in which people normally sleep	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	83 VdB	40 dBA	48 dBA

1 "Frequent Events" is defined as more than 70 events per day.
2 "Infrequent Events" is defined as fewer than 70 events per day.
3 This criterion limit is based on levels acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research requires detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4 Vibration-sensitive equipment is used in buildings where sufficient noise attenuation is provided; additionally, such equipment is not sensitive to either airborne or groundborne noise.

dB = decibels
dBA = A-weighted decibels
HVAC = heating, ventilation, and air-conditioning
inch/sec = inch(es) per second
VdB = vibration velocity decibels

Source: Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06).

Table 6 lists the vibration damage criteria for various structural categories. These are identified by the FTA as criteria that should be used during the environmental impact assessment phase to identify problem locations that must be addressed during final design.[6]

Table 6: Construction Vibration Damage Criteria

Building Category	PPV (inches/sec)	Approximate Lv[1]
Reinforced concrete, steel, or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

[1] RMS VdB re 1 micro-inch/second.
inches/sec = inches per second
Lv = 20 log10 (V/Vref) is the vibration velocity in decibels
PPV = peak particle velocity
RMS = root mean square
VdB = vibration velocity decibels

Source: Federal Transit Administration, 2006. Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).

Table 5 [criteria in terms of vibration velocity decibels (VdB)] and Table 6 [criteria in terms of inches per second (inches/sec) and VdB] are used to evaluate the effects of vibration on human response and structural damage. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 102 VdB (0.5 inch/sec) is considered safe and would not result in any construction vibration damage.[7] For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 inch/sec).

E. CONSTRUCTION NOISE IMPACTS

Construction-related short-term noise levels would be higher than current existing ambient noise levels in the project area, but would no longer occur once implementation of the project is completed.

Two types of short-term noise impacts could occur during the construction activities. First, the construction crew commutes and the transport of construction equipment to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Construction equipment operation would also generate temporary noise impacts.

a. Construction Transport Impacts. There would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (passing trucks at 50 feet would generate up to a maximum of 87 dBA L_{max}) and the effect on longer term (hourly or daily) ambient noise levels would be minimal.

[6] Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).*

[7] Ibid.

Construction related vehicle traffic, would vary throughout the construction period; including employee and material hauling trips. According to the *Traffic Impact Analysis* prepared for the project, the estimated maximum trips generated during project construction would be 162 per day, assuming that excavation, demolition, material hauling, installation, backfill, and paving all occur simultaneously. However, it is expected that the construction phases would not occur simultaneously, and the daily trips would therefore be significantly lower. Additionally, the additional vehicle trips would be distributed spatially throughout local roadways and temporally throughout the day. The expected effect on overall traffic noise would therefore be a less than 2 dBA increase over the 24-hour period. This change is not perceptible to the human ear in an outdoor environment. Therefore, short-term construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

b. Construction Equipment Noise Impacts. The second type of short-term noise impact is related to noise generated during construction activities associated with the repair and replacement of the water mains. Table 7 lists construction equipment noise levels (L_{max}) included in the Federal Highway Administration (FHWA) *Highway Construction Noise Handbook*[8].

The noise levels in Table 7 are based on a distance of 50 feet between the equipment and a noise receptor. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings.

Construction of the proposed project is expected to occur over a 17-month period. Construction equipment is expected to include a backhoe loader, a compactor, a hydraulic excavator, various hand equipment, a dump truck, a road sweeper, material handlers, a motor grader, paving equipment, an air compressor, a wheel dozer, and a crane. Based on the noise level data provided in Table 7, the estimated maximum noise level generated by one piece of equipment used for the project would reach 85 dBA L_{max} at 50 feet. Each doubling of the sound sources with equal strength increases the noise level by 3.0 dBA. Construction equipment is expected to be spread out between the various construction areas; therefore, the maximum noise level is expected to reach 85 dBA L_{max} at a distance of 50 feet, which would be above the County's maximum noise level of 75 dBA for construction equipment noise sources of less than 10 days and the maximum noise level of 60 dBA for construction periods of more than 10 days.

[8] Federal Highway Administration, 2006. *Highway Construction Noise Handbook.* August.

Table 7: Noise Emission Reference Levels and Usage Factors

Equipment Description	Impact Device?	Spec. 721.560 L_{max} at 50 Ft (dBA, slow)	Actual Measured L_{max} at 50 Ft (dBA, slow)
All other Equipment > 5 HP	No	85	N/A
Auger Drill Rig	No	85	84
Backhoe	No	80	78
Bar Bender	No	80	N/A
Blasting	Yes	94	N/A
Boring Jack Power Unit	No	80	83
Chain Saw	No	85	84
Clam Shovel (dropping)	Yes	93	87
Compactor (ground)	No	80	83
Compressor (air)	No	80	78
Concrete Batch Plant	No	83	N/A
Concrete Mixer Truck	No	85	79
Concrete Pump Truck	No	82	81
Concrete Saw	No	90	90
Crane	No	85	81
Dozer	No	85	82
Drill Rig Truck	No	84	79
Drum Mixer	No	80	80
Dump Truck	No	84	76
Excavator	No	85	81
Flat Bed Truck	No	84	74
Front End Loader	No	80	79
Generator	No	82	81
Generator (< 25 kVA, VMS Signs)	No	70	73
Gradall	No	85	83
Grader	No	85	N/A
Grapple (on backhoe)	No	85	87
Horizontal Boring Hydraulic Jack	No	80	82
Hydra Break Ram	Yes	90	N/A
Impact Derive	Yes	95	101
Jackhammer	Yes	85	89
Man Lift	No	85	75
Mounted Impact Hammer (hoe ram)	Yes	90	90
Pavement Scarifier	No	85	90
Paver	No	85	77
Pickup Truck	No	55	75
Pneumatic Tools	No	85	85
Pumps	No	77	81
Refrigerator Unit	No	82	73
Rivet Buster/Chipping Gun	Yes	85	79
Rock Drill	No	85	81
Roller	No	85	80
Sand Blasting (single nozzle)	No	85	96
Scraper	No	85	84
Sheers (on backhoe)	No	85	96
Slurry Plant	No	78	78
Slurry Trench Machine	No	82	80
Soil Mix Drill Rig	No	80	N/A

Table 7: Noise Emission Reference Levels and Usage Factors

Equipment Description	Impact Device?	Spec. 721.560 L_{max} at 50 Ft (dBA, slow)	Actual Measured L_{max} at 50 Ft (dBA, slow)
Tractor	No	84	N/A
Vacuum Excavator (Vac-Truck)	No	85	85
Vacuum Street Sweeper	No	80	82
Ventilation Fan	No	85	79
Vibrating Hopper	No	85	87
Vibratory Concrete Mixer	No	80	80
Vibratory Pile Driver	No	95	101
Warning Horn	No	85	83
Welder/Torch	No	73	74

dBA = A-weighted decibels
FHWA = Federal Highway Administration
ft = foot/feet
ft-lb/blow = foot-pounds per blow
HP = horsepower
kVA = kilovolt-ampere
L_{max} = maximum instantaneous noise level
N/A = Not Applicable
VMS = variable-message sign

Source: Federal Highway Administration, 2006. *Highway Construction Noise Handbook.*

The distance at which the maximum noise level would be below 75 dBA would be approximately 160 feet. The distance at which the maximum noise level would be below 50 dBA would be approximately 1,000 feet. The City does not have maximum noise level standards for construction equipment. However, the County requires that construction projects implement technically and economically feasible measures to maintain construction noise levels below the 75 dBA limit. Therefore, the following measures should be implemented to ensure that all technically and economically feasible measures are implemented.

- All construction equipment shall have appropriate sound muffling devices, which shall be properly maintained and used at all times such equipment is in operation.
- When feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from the closest off-site sensitive receptors.
- The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project construction areas.
- Noise-producing construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and the hours of 9:00 a.m. to 6:00 p.m. on Saturday. Noise-producing construction activities shall not occur on Sundays or federal holidays.
- A publicly visible sign shall be posted with the telephone number and contact information for the designated on-site construction manager available to receive and respond to noise complaints. This person shall take immediate action to validate and correct the complaint as soon as practical after the complaint is received.
- For construction activities lasting 10 days, temporary sound barriers shall be installed at all proposed construction areas located less than 160 feet from noise-sensitive land uses. For construction activities lasting more than 10 days, sound barriers must be installed for areas within 1, 000 feet of noise-sensitive land uses. The sound barriers shall be constructed in a manner that reduces noise levels by a minimum of 10 dBA.

Implementation of these measures would reduce construction equipment noise levels by up to 10 dBA. Implementation of these mitigation measures would ensure that all technically and economically feasible measures are implemented to reduce construction noise levels.

If the District determines that nighttime construction would be necessary, maximum noise levels generated by the project during the hours of 7:00 p.m. to 10:00 p.m. would cause a disturbance to hours defined as relaxation hours, while construction between 10:00 p.m. and 7:00 a.m. has the potential to cause sleep interruption based on the predicted construction noise levels. Therefore, additional measures to minimize nighttime construction noise should be implemented if nighttime construction is proposed.

F. CONSTRUCTION VIBRATION IMPACTS

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernable. However, without the effects associated with the shaking of a building, there is less adverse reaction. Construction on the project site would not result in the exposure of persons to excessive groundborne vibration or groundborne noise levels. Groundborne vibration during construction activity is temporary and would cease to occur after project construction is completed.

Table 8: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 ft (inches/sec)
Pile Driver (impact), typical	0.644
Pile Driver (sonic), typical	0.170
Vibratory roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Crack-and-seat operations	2.400

ft = feet
inches/sec = inches per second
PPV = peak particle velocity
Sources: Federal Transit Administration 2006 (except Hanson 2001 for vibratory rollers); and California Department of Transportation, 2000 (for crack-and-seat-operations).

The proposed project would not use pile driving equipment, but would use construction equipment similar to large bulldozers. As shown in Table 8, a large bulldozer would generate approximately 0.089 PPV (in/sec) when measured at 25 feet.

Experience with groundborne vibration indicates that vibration propagation is more efficient in stiff clay soils than in loose sandy soils. Shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at some distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

Regarding the potential for building damage, Table 8 shows that vibration levels from construction equipment and activities, including bulldozers would be less than 0.09 inch/sec at 25 feet from the project construction area.[9] The California Department of Transportation (Caltrans) states that it takes

[9] Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).*

at least 0.9 inch/sec of PPV for the human response to be strongly perceptible, or 0.25 inch/sec to be distinctly perceptible.[10] The nearest sensitive indoor receptors are more than 40 feet from the project area. None of the predicted vibration levels (all below 0.1 inch/sec) for sensitive uses in the vicinity of the project site would reach either of these two threshold levels. Thus, no significant vibration impacts are anticipated, and no mitigation is required.

[10] California Department of Transportation, 1992. *Transportation-related Earthborne Vibrations, Technical Advisory*.

This page intentionally left blank.

APPENDIX D
Construction Traffic Analysis

CONSTRUCTION TRAFFIC ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL

COUNTY OF SANTA CLARA, CALIFORNIA

LSA

October 2016

CONSTRUCTION TRAFFIC ANALYSIS

MAIN AVENUE AND MADRONE PIPELINE RESTORATION PROJECT

CITY OF MORGAN HILL

COUNTY OF SANTA CLARA, CALIFORNIA

Submitted to:

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Prepared by:

LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614
(949) 553-0666

Project No. SWD1501

LSA

October 2016

TABLE OF CONTENTS

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

INTRODUCTION

LSA Associates, Inc. (LSA) has prepared the following Construction Traffic Analysis to disclose the potential impacts resulting from the construction of the Main Avenue and Madrone Pipeline Restoration Project (project) near the City of Morgan Hill (City) in the County of Santa Clara (County), California. The project is not anticipated to result in increased traffic volumes upon completion of construction because maintenance of the pipeline will continue on the same schedule as the existing pipeline. The purpose of this analysis is to identify the effects of traffic generated during the project construction period, and to provide mitigation recommendations for any significant traffic impacts.

The study area for this project overlaps with the boundary between the City and unincorporated areas governed by the County. Because of this, both County and City guidelines have been used in this study. The City defers to the County trip threshold of 100 peak-hour trips for requiring a traffic impact analysis. As the Construction Trip Generation section shows, this project will generate less than 100 peak-hour trips and does not require a traffic impact analysis. This Construction Traffic Analysis is a focused analysis for the intersections near the project site where vehicles making specific turning movements might have needed to be addressed temporarily.

The Live Oak High School is located adjacent to the pipeline between Half Road and Main Avenue, west of Elm Road. Other uses adjacent to the pipeline include single-family residential and agricultural (i.e., vineyards and orchards). Figure 1 shows the project location and study area intersections.

PROJECT DESCRIPTION

The proposed project would restore the Main Avenue and Madrone pipelines in an area that lies partially within the City of Morgan Hill and partially in an unincorporated area of Santa Clara County, bordering the City and within the City's sphere of influence. Surrounding uses include low-density residential and agricultural, as well as a high school with buildings located approximately 1,000 feet from the project. The project site is generally bound to the southwest by United States Highway 101 (US 101), and to all other directions by agricultural land interspersed with low-density residential developments.

Construction is expected to begin July 2017 and require 17 months for completion. The proposed project would be fully operational by November 2018. Construction phases would include demolition, excavation and fill, pipeline installation, and pavement restoration, with several of the phases likely occurring simultaneously during portions of the project. The demolition phase would include the demolition and removal of existing asphalt, pipelines and a 100 square foot chemical feed station. Excavation and fill would use the open-trench method and would require the removal of approximately 153,300 cubic yards of soil and replacement with approximately 2,900 cubic yards of pipeline, 3,400 cubic yards of imported bedding, and 146,700 cubic yards of backfill, leaving 6,300 cubic yards to be exported to the nearest landfill. Approximately 13,960 feet of 30 to 36 inch diameter pipeline would be installed. Construction includes installation of underground utility vaults and construction of a new chemical feed station. Asphalt would be restored and a new chemical feed station would be constructed closer to Main Avenue Ponds.

The alignment plan is shown on Figure 2. The pipeline segments are arranged as follows.

LSA

LEGEND

- Study Area Intersection

- Main Avenue Pipeline

- Madrone Pipeline

N

0 1000 2000

FEET

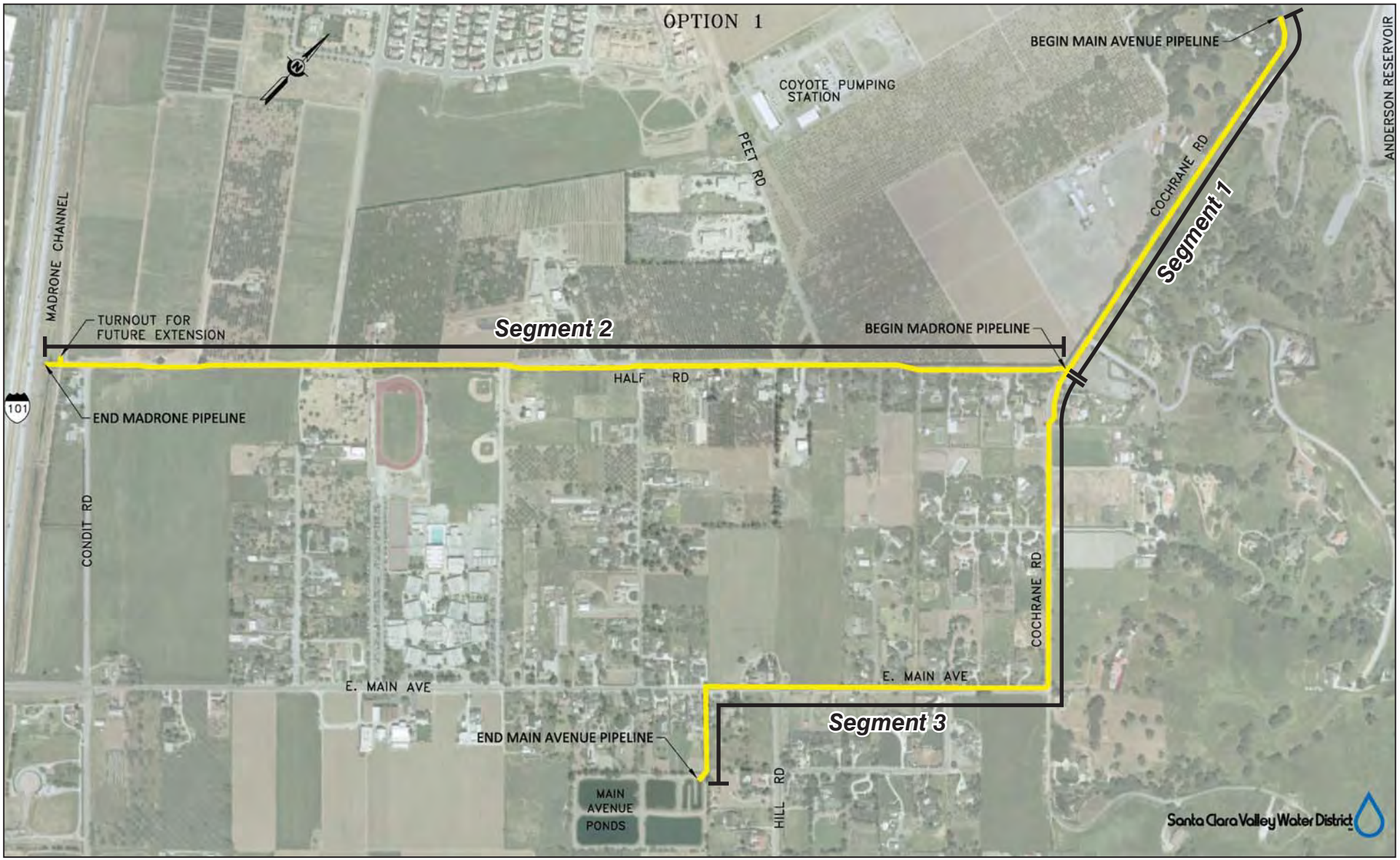
SOURCE: Google Earth

I:\SWD1501\G\Traffic\Location&Study Ints.cdr (10/19/2016)

FIGURE 1

Main Avenue and Madrone Pipeline Restoration Project

Project Location and Study Area Intersections



LSA

FIGURE 2

Main Avenue and Madrone Pipeline Restoration Project
Alignment Plan

SOURCE: Santa Clara Valley Water District

I:\SWD1501\G\Traffic\Alignment Plan.cdr (10/19/2016)

- Segment 1 is composed of the 2,800 linear feet (LF) of 16-inch diameter Main Avenue Pipeline from the Anderson Reservoir outlet to the Cochrane and Half Road intersection. Pipeline for Segment 1 would be replaced with 36-inch pipe.
- Segment 2 is composed of the 6,300 LF of 24-inch diameter and 30-inch diameter Main Avenue Pipeline from the Cochrane and Half Road intersection to the Madrone Channel. Pipeline for Segment 2 would be replaced with 30-inch pipe.
- Segment 3 is composed of the remaining 4,860 LF of 16-inch, 18-inch, and 24-inch diameter Madrone Pipeline from the Cochrane and Half Road intersection to the Main Avenue Ponds. Pipeline for Segment 3 would be replaced with 30-inch pipe.

CONSTRUCTION PHASES

According to the project description dated January 21, 2016 (Appendix A), the proposed project includes repair/replacement of portions of the Santa Clara Valley Water District's (District) Main Avenue and Madrone Pipeline, relocation and construction of the Chemical Feed Station, and installation of underground utility vaults and a new Energy Dissipater, all located south of the Coyote Pumping Station. Three staging areas for construction activities are located along the construction sites. Figures 1 and 2 illustrate the locations of the construction site and staging areas.

Construction activities are anticipated to commence in July 2017 and continue through November 2018 (17 months). The following four construction phases have been identified based on the list of equipment and experience from previous pipeline replacement projects.

1. Excavation and Pipeline Demolition
2. Material Hauling
3. Pipeline Installation and Backfill
4. Paving

These phases could occur simultaneously along different sections of the pipeline as work proceeds along the construction zone. Therefore, this analysis presumes all phases will add project trips.

CONSTRUCTION TRIP GENERATION

According to the project description, three types of trips will be generated by the construction activities: (1) employee commute trips; (2) construction task equipment trips; and (3) off-site material-hauling trips. As presented in Table A, the trip generation of each construction phase consists of various amounts of these three trip types.

Heavy equipment and large trucks have a greater effect on intersection and roadway operations than passenger vehicles. Therefore, the volume of heavy equipment and large trucks was converted to passenger vehicle equivalent (PCE) to account for their slower movement and lack of mobility. As Table A shows, a PCE factor of 2 was applied to equipment-delivery trips and material-hauling trips (a PCE factor of 1.5 was applied to the road sweeper, a medium-sized truck) to convert the vehicle trip generation into a PCE trip generation.

Table A: Main Avenue and Madrone Pipeline Restoration Project Trip Generation

Construction Vehicles (Daily)						Vehicle Trip Generation							PCE Trip Generation						
Vehicles			Quantity	Type	PCE	ADT	AM Peak Hour			PM Peak Hour			ADT	AM Peak Hour			PM Peak Hour		
							In	Out	Total	In	Out	Total		In	Out	Total	In	Out	Total
Employee Commute			25	Passenger Car	1.0	50	25	0	25	0	25	25	50	25	0	25	0	25	25
Off-Site Material Hauling			5	Large Truck	2.0	80	5	5	10	5	5	10	160	10	10	20	10	10	20
Construction Task Equipment	*Excavation and Pipeline Demolition*	Backhoe Loader	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Hydraulic Excavator	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Material Handlers	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Subtotal				*6*	*0*	*3*	*3*	*3*	*0*	*3*	*12*	*0*	*6*	*6*	*6*	*0*	*6*
	On-Site Material Hauling	Dump Truck	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Wheel Dozers	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Material Handlers	2	Large Truck	2.0	4	0	2	2	2	0	2	8	0	4	4	4	0	4
		Subtotal				*8*	*0*	*4*	*4*	*4*	*0*	*4*	*16*	*0*	*8*	*8*	*8*	*0*	*8*
	Pipeline Installation and Backfill	Hand Equipment	3	Pick-up Truck	1.0	6	0	3	3	3	0	3	6	0	3	3	3	0	3
		Road Sweeper	1	Medium Truck	1.5	2	0	1	1	1	0	1	3	0	2	2	2	0	2
		Crane	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Subtotal				*10*	*0*	*5*	*5*	*5*	*0*	*5*	*13*	*0*	*7*	*7*	*7*	*0*	*7*
	Paving	Compactor	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Motor Graders	1	Large Truck	2.0	2	0	1	1	1	0	1	4	0	2	2	2	0	2
		Paving Equipment	2	Large Truck	2.0	4	0	2	2	2	0	2	8	0	4	4	4	0	4
		Subtotal				*8*	*0*	*4*	*4*	*4*	*0*	*4*	*16*	*0*	*8*	*8*	*8*	*0*	*8*
Total						***162***	***30***	***21***	***51***	***21***	***30***	***51***	***267***	***35***	***39***	***74***	***39***	***35***	***74***

Note:

PCE = Passenger Car Equivalent

ADT = Average Daily Traffic

Construction vehicle estimates obtained from the project description.

The number of employees and equipment/vehicles was obtained from the project description. In order to present a conservative analysis, each employee is presumed to arrive at the site in a personal vehicle (passenger car) during the AM peak hour and leave the site in the PM peak hour every day.

Construction task equipment is expected to move from a staging area to somewhere along the construction site every day. As seen in Table A, the trips to and from staging areas to the construction site are assumed to occur during peak hours. Based on the nature of equipment trips, the AM peak-hour trips travel from the staging areas to the construction site and the PM peak-hour trips return to the staging areas. Because the overlap of each phase in each location is unknown, the highest PCE trip-generating phases (On-Site Material Hauling and Paving) were used to distribute trips throughout the study area. This strategy provides a worst-case scenario for the study area intersections.

Off-site material-hauling trips will haul old pipeline, and other displaced materials that are not part of the backfill, off site to a landfill or material recovery facility throughout the workday. The project description estimates that a total of 12,750 truckloads of material will be taken off site over the course of the 17-month construction schedule (i.e., 320 work days or 40 truckloads per day). The truckload estimate is based on an amount of material that was calculated under the worst-case scenario using a 2:1 slope. Material-hauling trips are expected to be distributed evenly in the work day. Based on the nature of material-hauling trips, the AM and PM peak-hour total trips were evenly split between inbound and outbound trips.

As Table A shows, the combined average daily traffic (ADT) for all three trip types (i.e., employee, equipment, and off-site hauling) is approximately 267 PCE. The project is expected to generate 74 a.m. peak-hour PCE trips (35 inbound and 39 outbound) and 74 p.m. peak-hour PCE trips (39 inbound and 35 outbound).

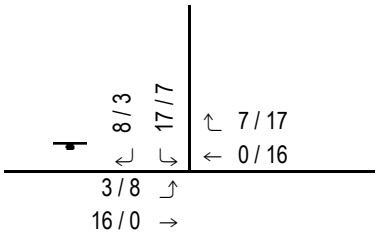
CONSTRUCTION TRIP ASSIGNMENT

Due to the particular travel patterns of each trip type (i.e., employee, equipment, and off-site hauling), project trips were distributed separately. All three trip types are divided equally among the three staging areas. Figure 3 shows the resulting project AM and PM peak-hour traffic volumes.

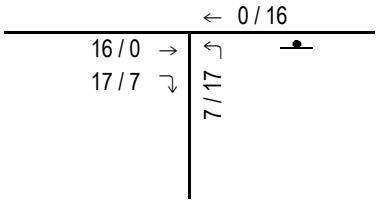
Employee trips have been distributed from US 101. Based on a geographical distribution of population, 60 percent of these trips are estimated to originate in the San Jose area, north of the project site, and the remaining 40 percent will originate south of the project site.

Construction task equipment trip distribution assumes a worst case condition in which all four phases are in progress simultaneously and crews will travel farthest away from the staging areas. As mentioned above, the highest PCE trip-generating phases were used to distribute trips throughout the study area. Therefore, there are eight AM peak-hour outbound trips from a staging area and eight PM peak-hour inbound trips to a staging area for each of the four construction task crews.

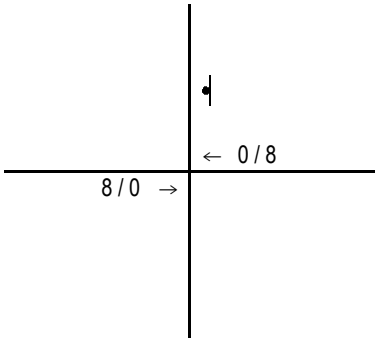
Off-site material-hauling trips will travel from staging areas to and from the US 101 ramps at Cochrane Road. As illustrated on Figure 3, trips are distributed to Cochrane Road via Mission View Drive. Inclusive of the employee trips, the project would add a total of 32 a.m. peak-hour trips (25 inbound and 7 outbound) and 37 p.m. peak-hour trips (20 inbound and 17 outbound) to Cochrane Road.



1 Mission View Dr / Half Rd

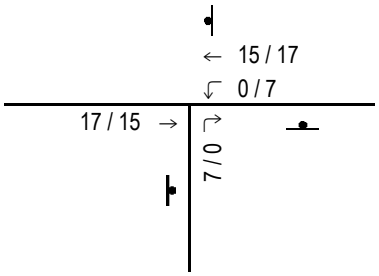


2 Elm Rd / Half Rd

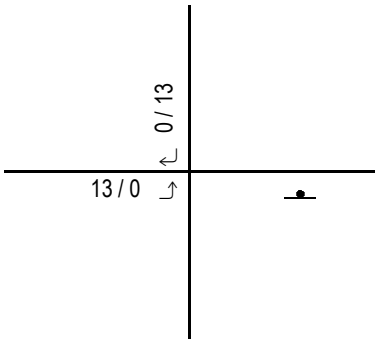


3 Peet Rd / Half Rd

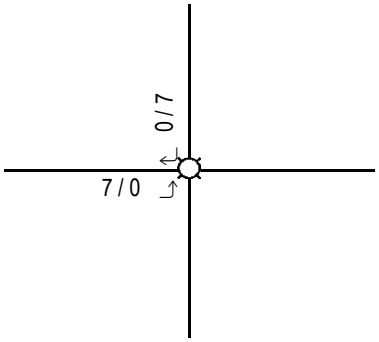
4 Elm Rd / Main Ave



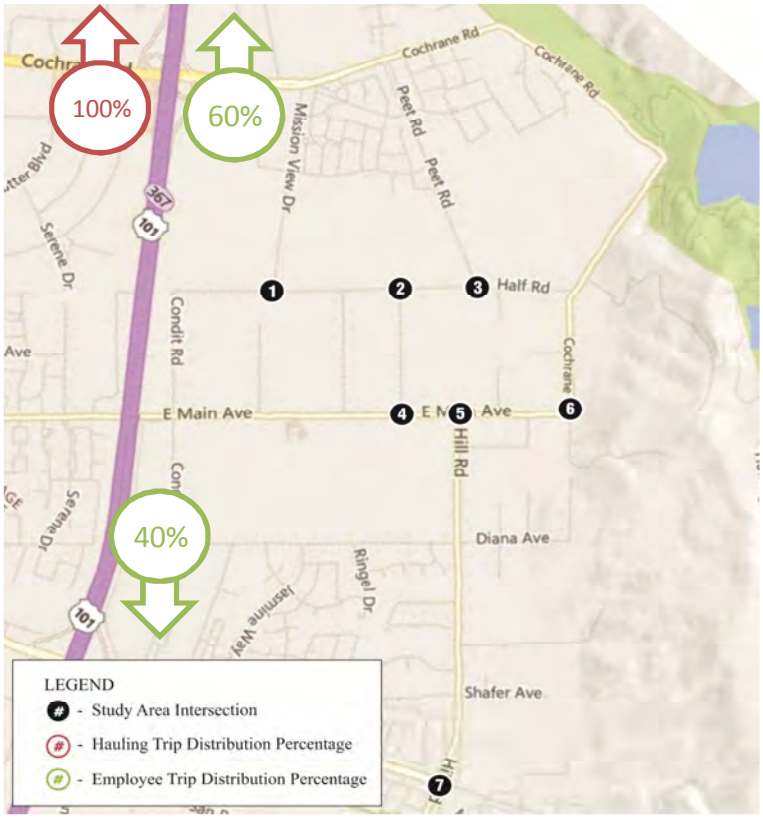
5 Hill Rd / Main Ave



6 Cochrane Rd / Main Ave



7 Hill Rd / Dunne Ave



LSA

FIGURE 3

XXX / YYY AM / PM Volume

Stop Sign Signal

Main Avenue and Madrone Pipeline Restoration Project

Project Peak-Hour Trip Distribution and Assignment

METHODOLOGY

This Construction Traffic Analysis is prepared consistent with applicable provisions of the California Environmental Quality Act (CEQA) and the criteria established by Santa Clara Valley Transportation Authority (VTA) *Traffic Impact Analysis Guidelines* (March 2009). Based on review of routes to and from regional roadways, the potential routes of construction traffic, and a preliminary conversation with the District, the following intersections were selected for analysis:

Study Area Intersections

As the Introduction states, this study is a focused analysis on the intersections near the project site where vehicles making specific turning movements might need to be addressed temporarily. The following list notes whether each of the seven study area intersections are under City or County jurisdiction or the intersection is shared between the City and County.

1. Mission View Drive/Half Road (Shared)
2. Elm Road/Half Road (Shared)
3. Peet Road/Half Road (Shared)
4. Elm Road/Main Avenue (County)
5. Hill Road/Main Avenue (County)
6. Cochrane Road/Main Avenue (County)
7. Hill Road/Dunne Avenue (City)

Level of Service Methodology

According to the VTA *Traffic Level of Service Analysis Guidelines* (June 2003), the most up-to-date version of the Highway Capacity Manual (HCM 2010) methodology is used to determine level of service (LOS) for both signalized and unsignalized intersections. HCM methodology analyzes delay experienced by vehicles at an intersection. Because no permanent changes to the roadway network are contemplated as part of the project it is not necessary to reevaluate the streets in accordance with the Complete Streets Act. However, construction traffic control will comply with the California Joint Utility Traffic Control Manual, which accounts for the movement of pedestrians and bicycles during temporary traffic control.

The resulting delay is expressed in terms of LOS, where LOS A represents free-flow activity and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations. LOS criteria for intersections using the HCM methodology are presented below.

Synchro 9.0 computer software was used in this analysis to determine the LOS at intersections based on the HCM 2010 methodology. The geometrics, capacity, and signal timing parameters are consistent with the standard parameters published by the VTA *Traffic Level of Service Analysis Guidelines* (June 2003).

LOS	Description
A	No approach phase is fully utilized by traffic, and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily, and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized, and a substantial number are nearing full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. This level represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, speed can drop to zero.

LOS = level of service

The relationship between LOS and delay (in seconds) at an intersection is as follows:

Level of Service	Signalized Intersection Delay per Vehicle (seconds)	Unsignalized Intersection Delay per Vehicle (seconds)
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	> 80.0	> 50.0

Thresholds of Significance

The County's threshold of significance for the Congestion Management Program (CMP) intersections is LOS E. Impacts of project traffic are considered significant if project traffic causes any intersection to deteriorate from satisfactory (LOS A through E) to unsatisfactory LOS (LOS F). A significant impact would occur if the addition of project traffic increased the critical volume-to-capacity (v/c) ratio by 0.01 or greater and by 4 seconds or more in the average critical delay of a deficient intersection (LOS F).

The City considers LOS A through D as satisfactory operations for City jurisdiction intersections. Impacts of project traffic are considered significant if project traffic causes any intersection to deteriorate from satisfactory (LOS A through D) to unsatisfactory LOS (LOS E or F). A significant impact would occur if the addition of project traffic increased the critical v/c ratio by 0.01 or greater

and/or a 4-second or higher increase in the average critical delay of a deficient intersection (LOS E or F).

The City's more conservative threshold will be used for intersections shared by the City and County.

EXISTING CONDITIONS

Peak-hour traffic volume data at study area intersections was collected in April 2016. Traffic volumes for some of the intersections were collected during a week that Live Oak High School was not in session. These traffic volumes were adjusted upward to account for school traffic that would occur under typical conditions. This was done by balancing the traffic volumes collected at adjacent intersections when school was in session (i.e., increasing traffic volumes arriving at one intersection to match the higher traffic volume departing from the adjacent intersection). Figure 4 presents the existing AM and PM peak-hour turn-movement volumes for the study area intersections. The traffic volume data sheets for all study area intersections are provided in Appendix B.

Table B summarizes the results of the existing AM and PM peak-hour LOS analysis for the study area intersections. All LOS calculation worksheets are provided in Appendix C. As Table B indicates, all study area intersections operate at an acceptable LOS in the AM and PM peak hours.

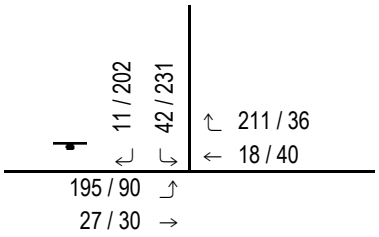
Table B: Existing Intersection LOS Summary

Study Area No.	Intersection[1]		Existing			
			AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	Mission View Drive/Half Road	*Shared*	15.6	C	15.8	C
2	Elm Road/Half Road	*Shared*	11.5	B	10.3	B
3	Peet Road/Half Road	*Shared*	8.30	A	8.30	A
4	Elm Road/Main Avenue	*County*	18.6	C	14.4	B
5	Hill Road/Main Avenue	*County*	17.9	C	9.30	A
6	Cochrane Road/Main Avenue	*County*	7.40	A	8.90	A
7	Hill Road/Dunne Avenue[2]	*City*	13.5	B	12.6	B

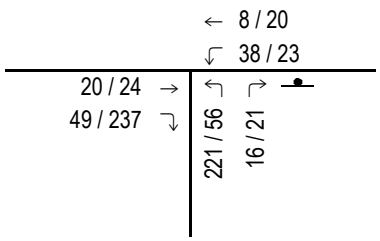
[1] Intersections are under the jurisdiction of the County unless otherwise noted.
[2] Signalized Intersection.
LOS = level of service
sec = seconds

EXISTING PLUS PROJECT CONDITIONS

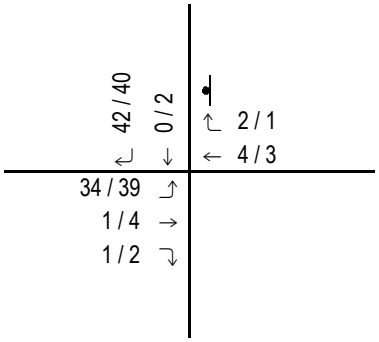
Project PCE trips were added to the existing traffic volumes at the study area intersections. Figure 5 shows the resulting existing plus project AM and PM peak-hour traffic volumes in PCEs. Table C summarizes the results of the existing plus project AM and PM peak-hour LOS analysis for all study area intersections. As Table C indicates, all study area intersections are anticipated to operate at acceptable LOS in the AM and PM peak hours during the construction project.



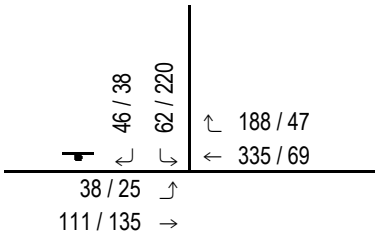
1 Mission View Dr / Half Rd



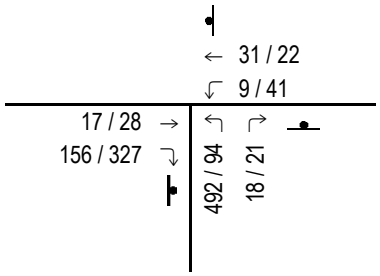
2 Elm Rd / Half Rd



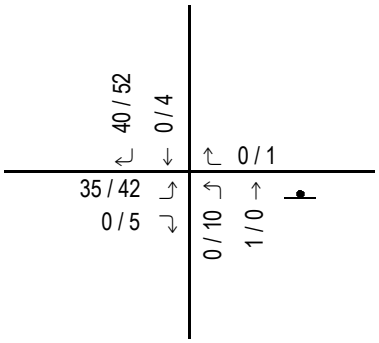
3 Peet Rd / Half Rd



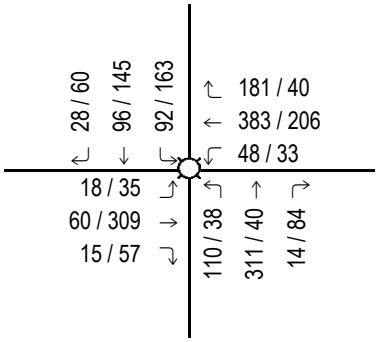
4 Elm Rd / Main Ave



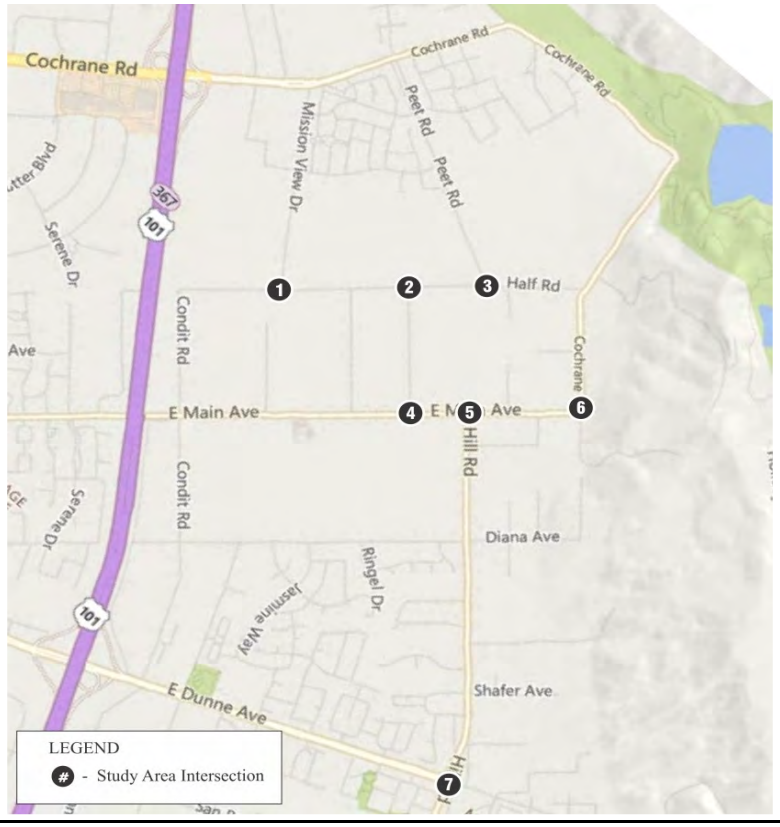
5 Hill Rd / Main Ave



6 Cochrane Rd / Main Ave



7 Hill Rd / Dunne Ave



LSA

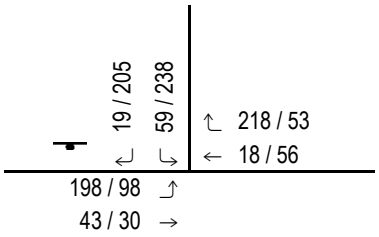
FIGURE 4

XXX / YYY AM / PM Volume

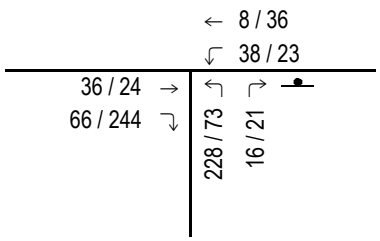
Stop Sign Signal

Main Avenue and Madrone Pipeline Restoration Project

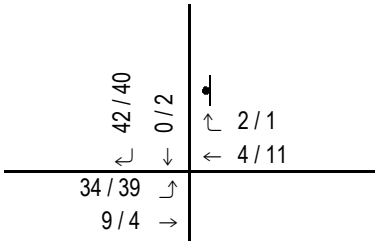
Existing Peak-Hour Traffic Volumes



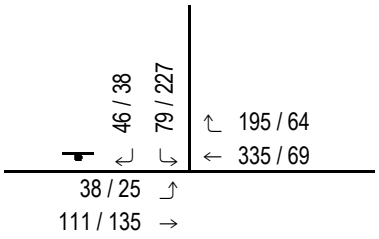
1 Mission View Dr / Half Rd



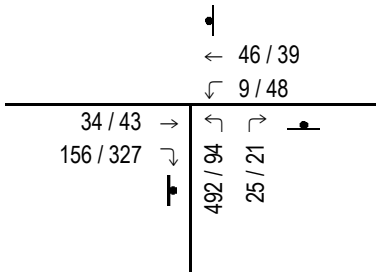
2 Elm Rd / Half Rd



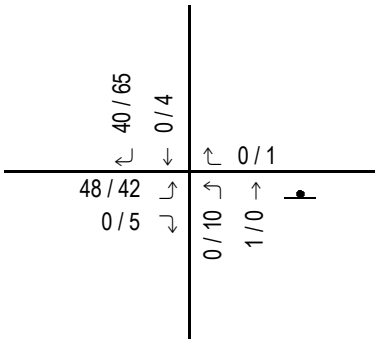
3 Peet Rd / Half Rd



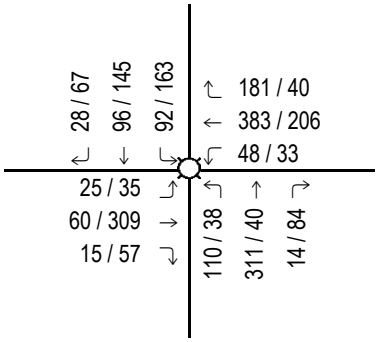
4 Elm Rd / Main Ave



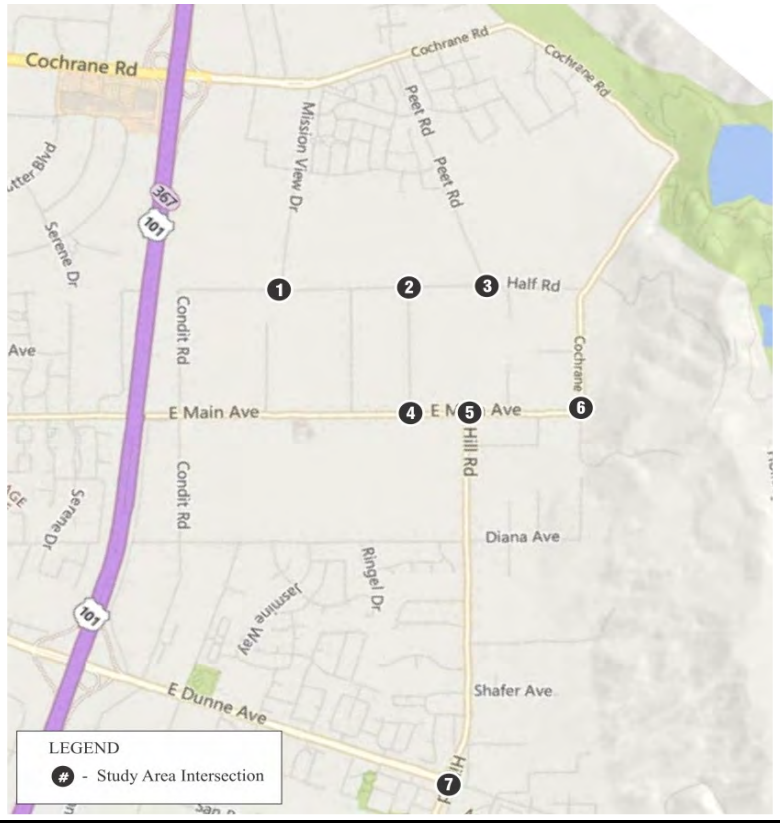
5 Hill Rd / Main Ave



6 Cochrane Rd / Main Ave



7 Hill Rd / Dunne Ave



LSA

FIGURE 5

XXX / YYY AM / PM Volume

Stop Sign Signal

Main Avenue and Madrone Pipeline Restoration Project

Existing Plus Project Peak-Hour Volumes

Table C: Existing Plus Project Intersection LOS Summary

Study Area No.	Intersection[1]		Existing				Existing Plus Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Mission View Drive/Half Road	*Shared*	15.6	C	15.8	C	16.9	C	17.9	C
2	Elm Road/Half Road	*Shared*	11.5	B	10.3	B	12.0	B	10.7	B
3	Peet Road/Half Road	*Shared*	8.3	A	8.3	A	9.4	A	8.4	A
4	Elm Road/Main Avenue	*County*	18.6	C	14.4	B	20.6	C	15.9	C
5	Hill Road/Main Avenue	*County*	17.9	C	9.3	A	19.3	C	9.7	A
6	Cochrane Road/Main Avenue	*County*	7.4	A	8.9	A	7.4	A	8.9	A
7	Hill Road/Dunne Avenue[2]	*City*	13.5	B	12.6	B	14.9	B	12.6	B

[1] Intersections are under the jurisdiction of the County unless otherwise noted.
[2] Signalized Intersection.
LOS = level of service
sec = seconds

CONCLUSION

Based on the results of this Construction Traffic Analysis, the proposed pipeline construction for the Main Avenue and Madrone Pipeline Restoration Project is not anticipated to create or exacerbate any significant impacts to the existing study area intersections during any phase of analyzed construction activities.

APPENDIX A

PROJECT DESCRIPTION

Project Description Checklist

Project Title: Main Avenue and Madrone Pipeline Restoration Project Construction

DEFINE PROJECT

Project Category (Facility Type)	Action (Operation Type)
check one or more	**check one or more**
___X___ Pipeline	___X___ Raw Water Discharge
_____ Reservoir	_____ Potable Water Discharge
_____ Well	_____ Groundwater Pump-Out and Discharge
_____ Stream Related	_____ New Construction
_____ Pump Station	_____ Minor Repair or Maintenance (<50k)
_____ Water Treatment Plant	___X___ Major Repair of Maintenance (>50k)
_____ Recycled Water Treatment Plant	_____ Geotechnical Investigation
_____ Percolation Pond	_____Vegetation Clearing
_____ Fisheries Related	_____ Grading
_____ Water Import or Export	___X___ Traffic Control
_____ Groundwater Banking	___X___ Shutdown Facilities (Water Lines, etc.)
_____ Geotechnical Repair (landslide, etc.)	___X___ Adds Construction Traffic
_____ Hazardous Materials	___X___ Draining of Pipe
_____ Trails	_____ Draining of Reservoir
_____ Flood Control	_____ Dewatering of Soils or Project site
_____ Levees	_____ Stream Dry-back
_____ Roads	_____ Planning Study or Master Plan
_____ Bridges	_____ Field Study (Biological assessment, Wetlands delineation, Archaeology, etc.)
_____ New or Repair of Utilities (Elect or Other)	_____Other (Please describe)
_____ New or repair of control systems(electrical or hydraulic, or other)	
_____ Antennas	
_____ Habitat Conservation Plan (Sec 10)	
_____ Underground Storage tank removal or new addition	
_____ Water Meter Addition / Removal / Replacement	

Project Title: Main Avenue and Madrone Pipeline Restoration Project

Project # and Task #: 26564001-1313

Project Location - Describe (Please include specific address if any)

The project area is located within an unincorporated area of Santa Clara County bordering the City of Morgan Hill. The area is mainly rural, residential, and agricultural. Construction will occur on Cochrane Road, Half Road, and Main Avenue, which are located on the eastside of US 101.

Project Background:

Refer to Section 1.1 of Planning Study Report[1].

Project Description-Describe:

Refer to Section 3 of Planning Study Report[2].

Project Objectives:

For the Main Avenue Pipeline (From Anderson Reservoir outlet to Cochrane and Half Road Intersection):

- Install 36" steel pipe
- Remove existing 16" steel pipe and appurtenant facilities
- Install Blow-off Valve Assemblies

For the Main Avenue Pipeline (From Anderson Reservoir outlet to Cochrane and Half Road Intersection):

- Install 30" steel pipe
- Remove existing 16", 18", and 24" Reinforced Concrete Pipe and appurtenant facilities
- Install Blow-off Vale Assemblies
- Install Combination Valve Assemblies
- Install Tee

For Madrone Pipeline

- Install 30" Steel Pipe
- Remove and/ or abandon in-place existing 24" RCP, 30"CMP and appurtenant facilities
- Remove and/ or abandon in-place existing 10" ACP and appurtenant facilities

For entire project

- Remove and construct Chemical Feed Station closer to Main Avenue Ponds
- Install a new Energy Dissipater and potentially a new Energy Recovery Device at the end of the Madrone Pipeline.

Any Neighborhood Sensitivities-Describe:

The neighborhood primarily consists of farm lands and residential areas.

Schedule

How long will construction/repair/or maintenance take? 17 months
When is the project expected to begin? July, 2017
When is the project expected to end? November 2018

---

[1] Main Avenue and Madrone Pipelines Restoration Project –Planning Study Report, Pg 3, 2015. http://www.valleywater.org/uploadedFiles/Programs/Safe_Clean_Water_and_Natural_Flood_Protection/Priority_A/2015-03-10%20Main-Madrone%20PL%20Restoration%20Project%20Final%20PSR.pdf?n=621

[2] Main Avenue and Madrone Pipelines Restoration Project –Planning Study Report, Pg 16-17, 2015. http://www.valleywater.org/uploadedFiles/Programs/Safe_Clean_Water_and_Natural_Flood_Protection/Priority_A/2015-03-10%20Main-Madrone%20PL%20Restoration%20Project%20Final%20PSR.pdf?n=621

Construction / Repair / Maintenance

Describe the areas that will be used for staging, and/or other operations.
TBD, staging area is tentatively planned to be approximately 200' x 300'

Does the project involve removal of vegetation? Yes

If yes, what type and how many? _____Mature trees _____ Wetland vegetation

_____X____ other (please describe)

Due to the history of root intrusion along Half Road, the trees placed in the District's right-of way may be removed.

Describe areas that will be restored to natural condition after construction?
None. All work is anticipated to be within existing roadways.

What equipment and how many of each will be used? _____

_____Articulated Trucks	_____Knuckleboom Loaders	_____ Skid Steer Loaders
__1__Backhoe Loaders	__3__Material Handlers	_____ Skidders
_____Cold Planers	__1__ Motor Graders	_____Soil Stabilizers
__1__Compactors	_____ Multi Terrain Loaders	_____Telehandlers
_____Feller Bunchers	_____ Off Highway Tractors	_____Track Loaders
_____Forest Machines	_____ Off Highway Trucks	____ Track-Type Tractors
_____Forwarders	__2__ Paving Equipment	__1_ Wheel Dozers
_____Front Shovels	_____ Pipe-Layers	____Wheel Loaders
_____Harvesters	_____ Road Reclaimers	____ Scrapers
__1__Hydraulic Excavators	_____Portable Pumps	__1_Cranes
__3__Hand Equipment	__1__Air Compressor	____Other
__1__Dump Truck	_____Other	____ Other
__1__Road Sweeper	_____Other	____ Other
_____Other	_____Other	____ Other

Any Noise issues related to the project?
Removing pipe, excavating, and drilling will produce construction related noise

Any Traffic issues related to the project?
Construction along existing roadways would require traffic control measures such as lane detours, signs, barricades, K-rails, fences, gates, flag-men, radios, flares, and miscellaneous traffic control devices.

Describe water management (described below) in stream pre-construction, during, and post-construction
If needed:

1. Dewatering
2. Re-routing of flow
3. Adjustment to water supply operations

What hazardous materials will be used for the project?
No hazardous materials have been identified. The contractor may use diesel and other materials for the operation and maintenance of construction equipment.

List materials (MDS#) and quantity? None

How many employees or outside (contract) workers will be involved in the project?
It is estimated that approximately 20-25 employees may be present at any given day during the construction

How will workers get to the project site?
Workers will have access to the construction site through existing paved roads. They include: Cochrane and Half Road and Main Avenue among others.

What will be the range of hours that the project activities will occur?
Mon – Fri 8:00am to 5:00 pm

Where will project materials be obtained?
Within California or Within the USA

How many truck loads of project materials will be necessary?
Using sloped trenches, approximately 300 truckloads for pipe bedding materials, and 12,300 truckloads for backfill.

Where will equipment be maintained?
Equipment will be maintained within paved staging or construction areas

What routes will workers use to access the site?

Workers will use existing roads.

Which areas of the site will be cut (earth materials)? What is the size of the cut in cubic yards?
Cut areas will include the location of pipelines that lie beneath county/ city roads and facilities (chemical feed station and Main Avenue Ponds) located on District's easement. Using 1½-to-1 sloped trenches, an approximate maximum of 146,700 cubic yard of material will be excavated.

Where will cut materials be used for fill? .
Yes, some cut material may be used as trench backfill.

Will cut or spoil materials be transported off site? **Where to**?

Yes, some cut material will be transported offsite. The Contractor will be tasked with the proper disposal of the material and a certificate from the landfill will be provided.

Will any other spoil materials be transported off site? **Is so how many and where to**?
Yes, the Contractor will also be tasked with the disposal of other materials. Amount and location TBD.

Operations

Which areas of the project site will be covered with hardscape?
Areas within existing right-of-way of existing roadways (Cochrane Road, Half Road to Hill Rd, and East Main Ave to Hill Rd).

Which areas of the project site will be covered with landscaping?
None. Most of the work is expected to be on paved roads.

What is the height and area extent (acres) of all structures proposed?
A few above ground appurtenances (blow-offs (1.5'x1.5'x3'), valves, one chemical feed station (10'x10'x10')) will be installed. No large structures are planned for this project.

What is the estimated size and energy source for equipment proposed to operate in the project?
Not Applicable

How long will the project be operational?
This is a permanent facility with a minimal 50-year lifespan.

Are there any aspects of the project that have not been included because they are "separate"?
Will there be a follow-on project(s)? Include a description.
No, however a turnout will be provided for future development near the Madrone Channel

Who owns the land that the project is proposed on?
The District, City of Morgan Hill, County of Santa Clara, and private property owners.

Does the project cross or affect lands other than District owned lands (i.e. federal, such as Bureau of Reclamation, Tribal land, or State owned lands?
Yes __X__ No ____

Maintenance Procedures That Will Continue On After the Primary Project

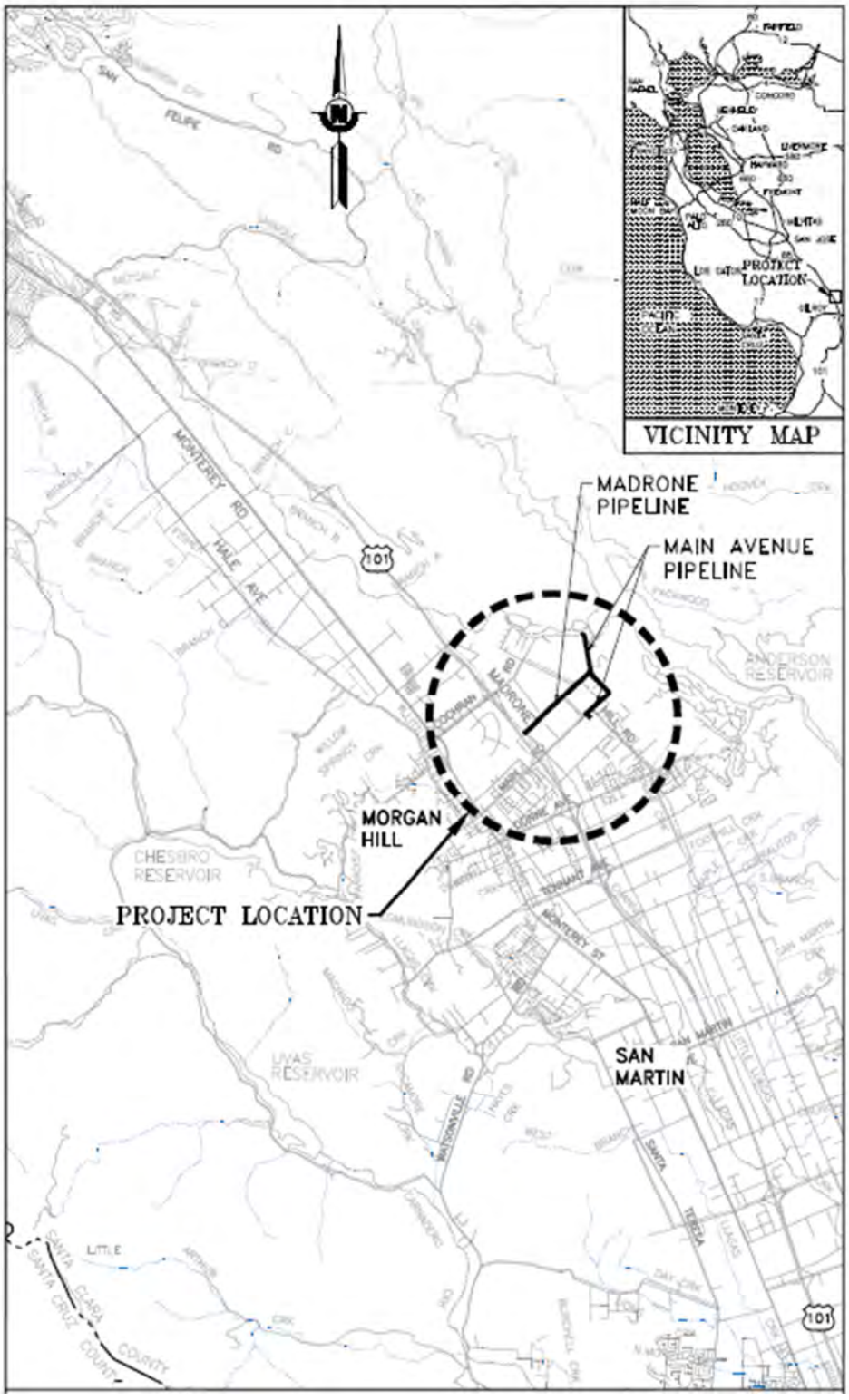
How often will maintenance be performed?
The maintenance of the facility will occur at time same frequency as the current schedule.

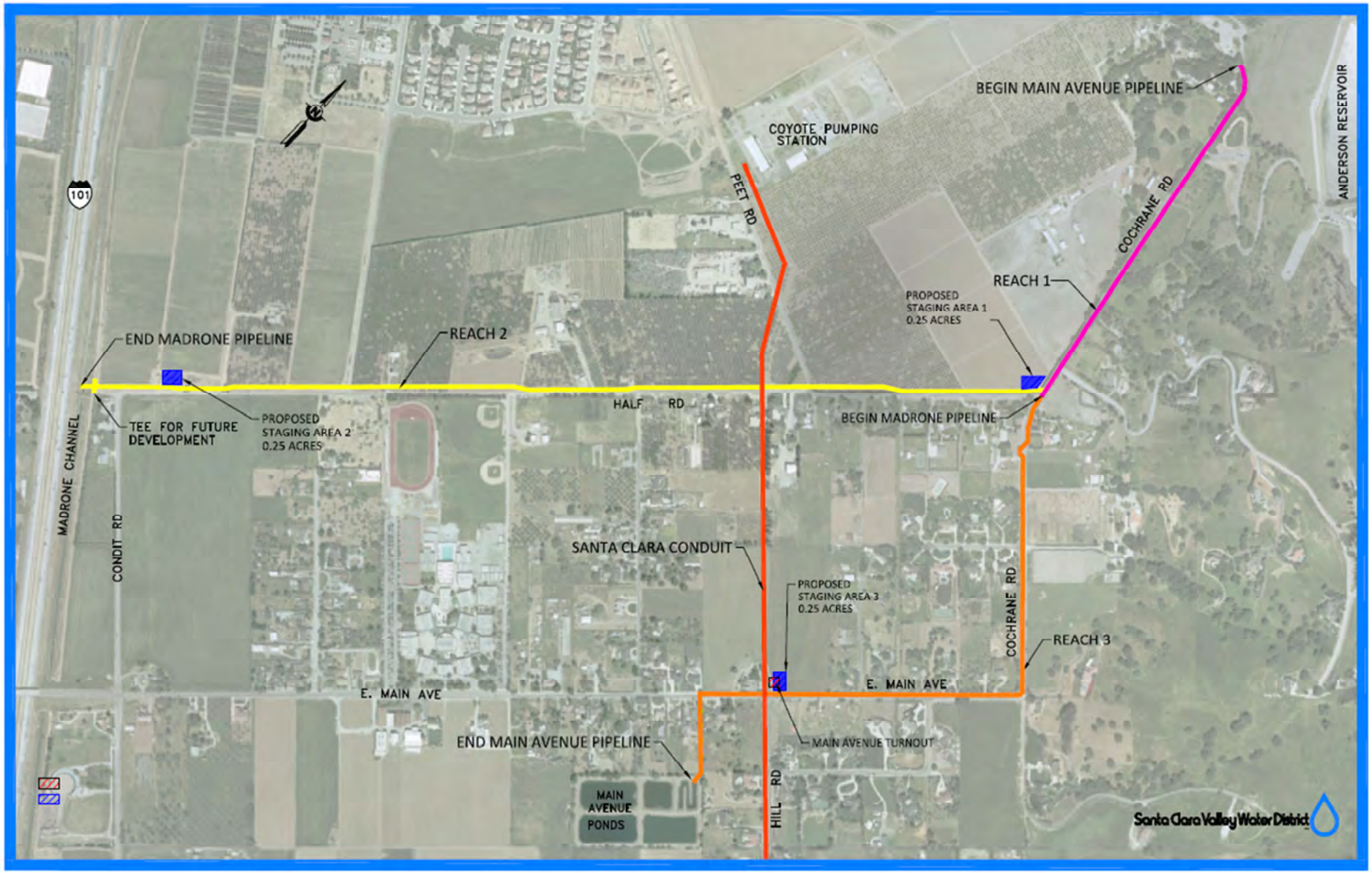
How long will maintenance last?
Maintenance will last throughout the lifespan of the facilities.

What will maintenance consist of?
Inspecting and maintaining the operational functions of the Anderson Dam outlet, the Madrone Channel and Half Road Turnout, the Main Avenue Turnout, and the Chemical Feed Station. A flowmeter will be added near the Main Avenue Ponds.

Graphics

Please provide Vicinity Map of work sites AND Location Map for each work site showing project limits, access routes, staging areas, etc.


VICINITY MAP
PROJECT LOCATION
MADRONE PIPELINE
MAIN AVENUE PIPELINE
MORGAN HILL
PROJECT LOCATION
SAN MARTIN
MONTEREY RD
HALE AVE
CHESBRO RESERVOIR
UVAS RESERVOIR
ANDERSON RESERVOIR
101


BEGIN MAIN AVENUE PIPELINE
COYOTE PUMPING STATION
ANDERSON RESERVOIR
PEET RD
COCHRANE RD
101
REACH 1
PROPOSED STAGING AREA 1 0.25 ACRES
END MADRONE PIPELINE
REACH 2
HALF RD
BEGIN MADRONE PIPELINE
TEE FOR FUTURE DEVELOPMENT
PROPOSED STAGING AREA 2 0.25 ACRES
MADRONE CHANNEL
CONDIT RD
SANTA CLARA CONDUIT
PROPOSED STAGING AREA 3 0.25 ACRES
COCHRANE RD
REACH 3
E. MAIN AVE
E. MAIN AVE
END MAIN AVENUE PIPELINE
MAIN AVENUE TURNOUT
MAIN AVENUE PONDS
HILL RD
Santa Clara Valley Water District

Supporting Calculations

TRENCH EXCAVATION							
SEGMENT	OD (IN)	LENGTH (L.F.)	MAX DEPTH (L.F.)	TOP WIDTH (L.F.)	BOTTOM WIDTH (L.F.)	CUT VOLUME (L.C.F)	CUT VOLUME (L.C.Y.)
1	36	2800	10.50	36.50	5	610050	22600
2	30	4860	13.00	44.00	4.5	1532115	56800
3	30	6300	13.00	44.00	4.5	1986075	73600
Total	-----	13960	-----	-----	-----	-----	153000

Bedding							
SEGMENT	OD (IN)	LENGTH (L.F.)	MAX DEPTH (L.F.)	TOP WIDTH (L.F.)	BOTTOM WIDTH (L.F.)	CUT VOLUME (L.C.F)	CUT VOLUME (L.C.Y.)
1	36	2800	1.00	8.00	5	18200	700
2	30	4860	1.00	8.00	4.5	30375	1200
3	30	6300	1.00	8.00	4.5	39375	1500
Total	-----	13960	-----	-----	-----	-----	3400

Pipe volume				
SEGMENT	OD (IN)	LENGTH (L.F.)	CUT VOLUME (L.C.F)	CUT VOLUME (L.C.Y.)
1	36	2800	19800.00	800
2	30	4860	23900.00	900
3	30	6300	31000.00	1200
Total	-----	-----	-----	2900

Back fill	
	Volume (C.Y.)
Excavation	153000
Bedding	3400
Pipelines	2900
Total	146700.00

Truck loads		
	Load per truck, c.y[1]	# of loads
Excavation	12	12750
Bedding	12	283
Backfill	12	12225

APPENDIX B

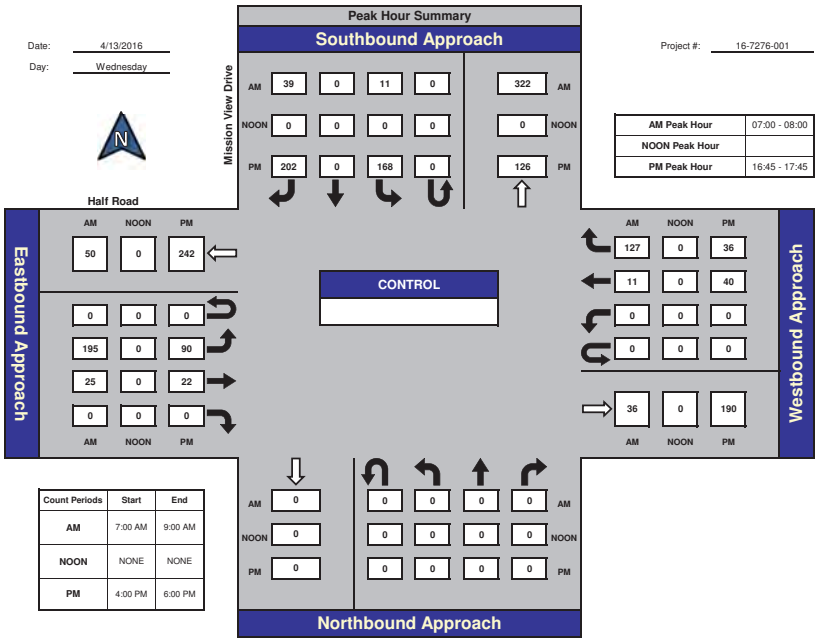
EXISTING TRAFFIC VOLUME DATA

Mission View Drive & Half Road

Date: 4/13/2016
Day: Wednesday
Project #: 16-7276-001

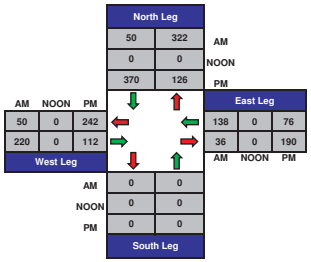
Peak Hour Summary

AM Peak Hour	07:00 - 08:00
NOON Peak Hour	
PM Peak Hour	16:45 - 17:45

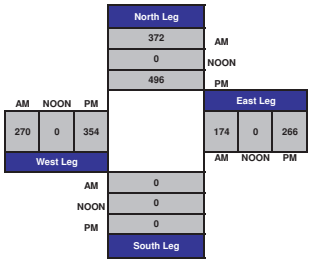


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

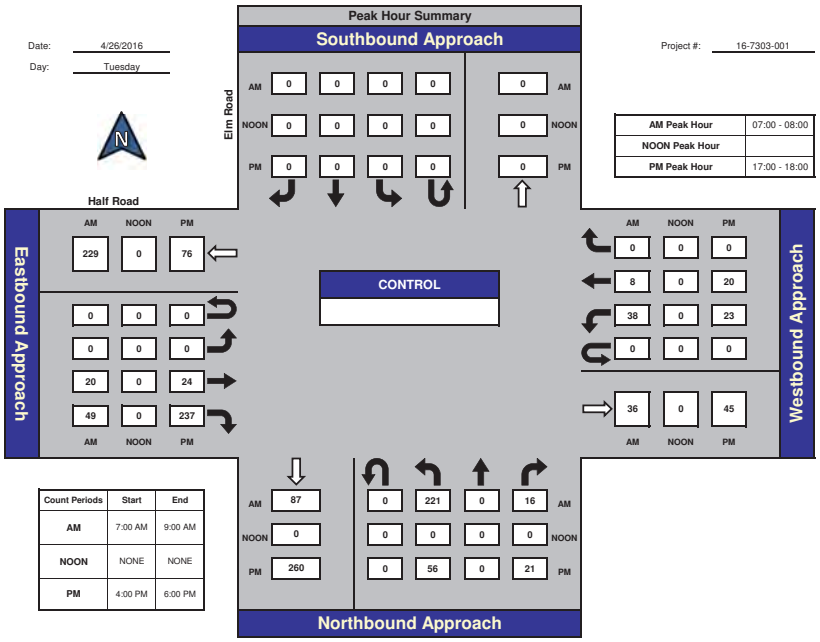


Elm Road & Half Road

Date: 4/26/2016
Day: Tuesday
Project #: 16-7303-001

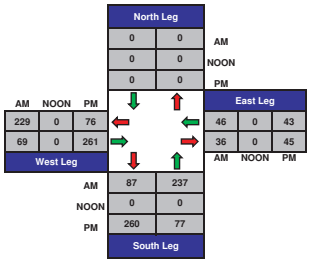
Peak Hour Summary

AM Peak Hour	07:00 - 08:00
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

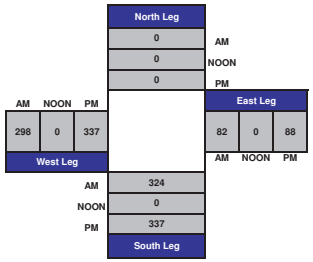


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

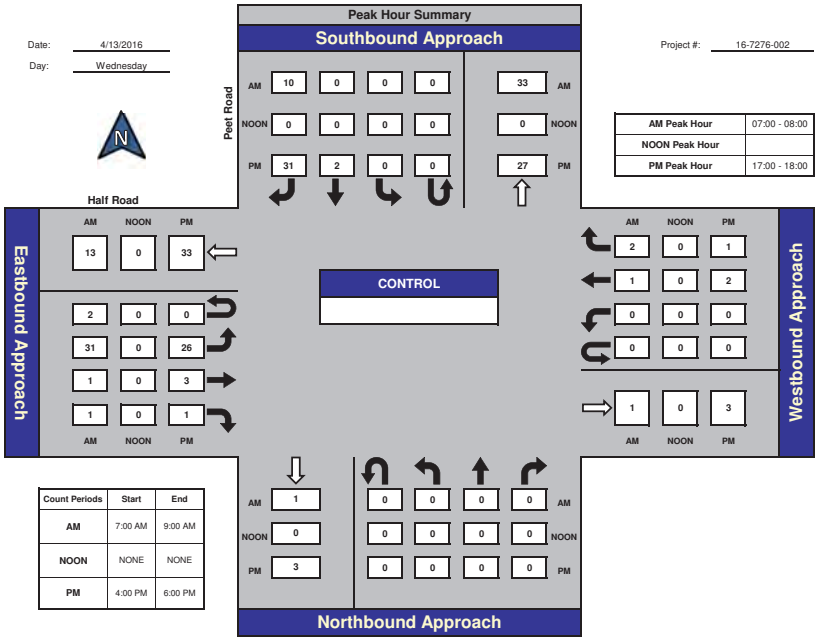


Total Volume Per Leg



Peet Road & Half Road

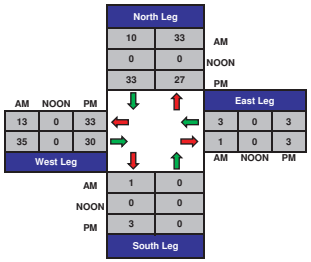
Date: 4/13/2016
Day: Wednesday
Project #: 16-7276-002



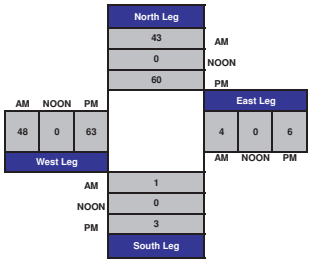
AM Peak Hour	07:00 - 08:00
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

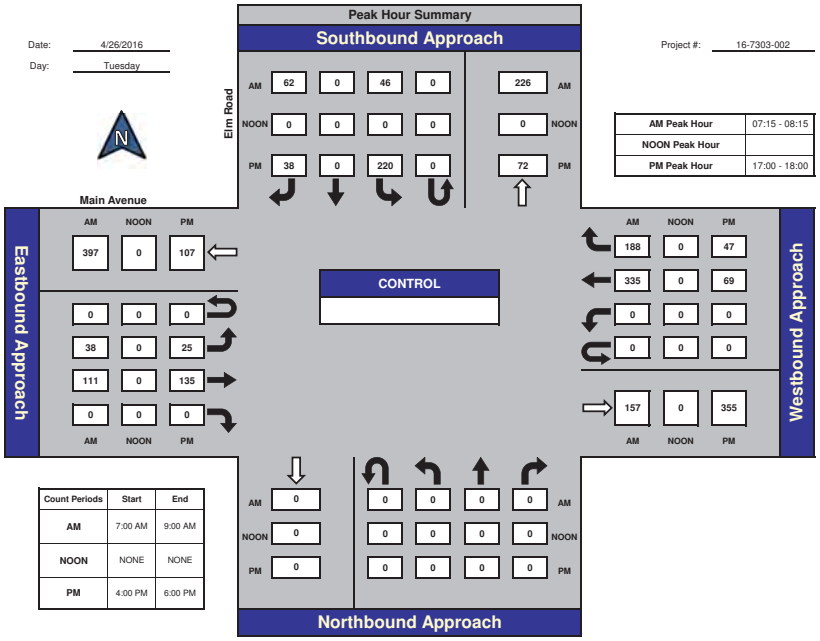


Total Volume Per Leg



Elm Road & Main Avenue

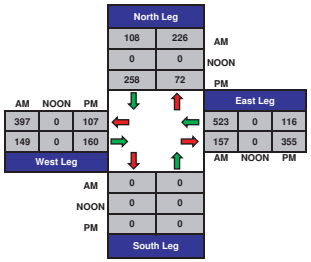
Date: 4/26/2016
Day: Tuesday
Project #: 16-7303-002



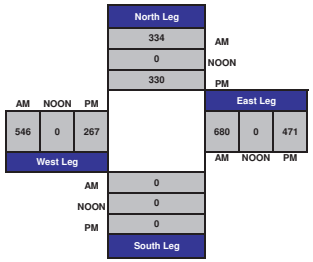
AM Peak Hour	07:15 - 08:15
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

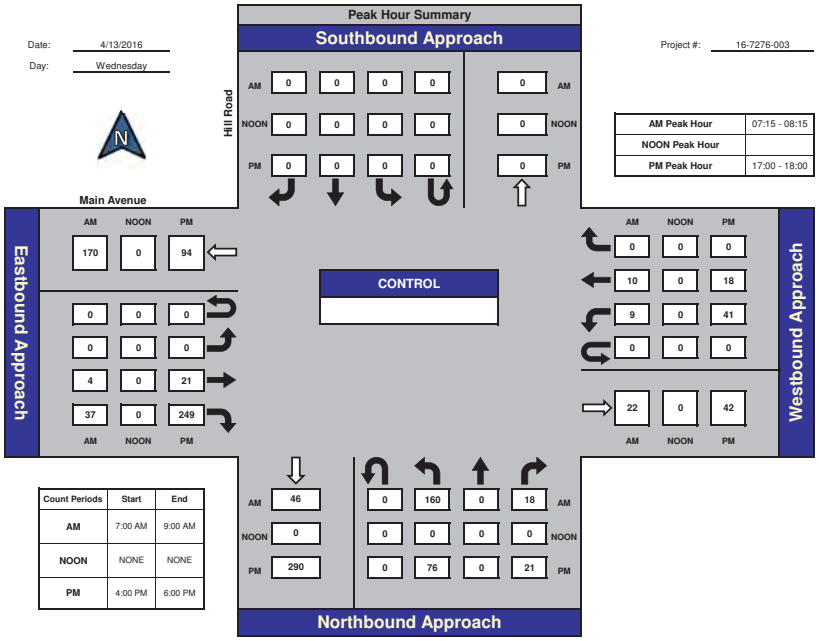


Total Volume Per Leg



Hill Road & Main Avenue

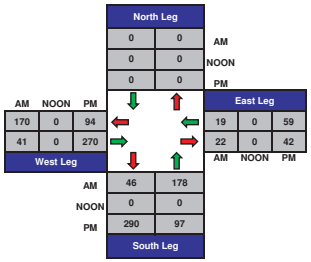
Date: 4/13/2016
Day: Wednesday
Project #: 16-7276-003



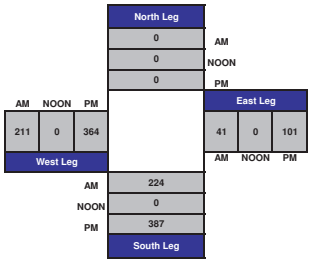
AM Peak Hour	07:15 - 08:15
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs

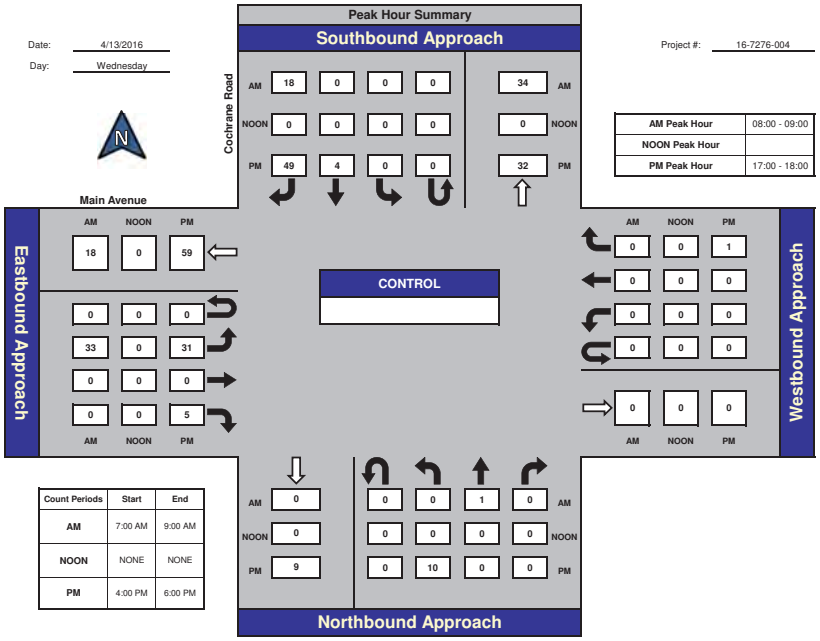


Total Volume Per Leg



Cochrane Road & Main Avenue

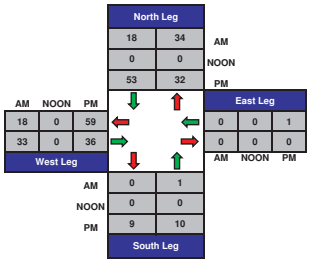
Date: 4/13/2016
Day: Wednesday
Project #: 16-7276-004



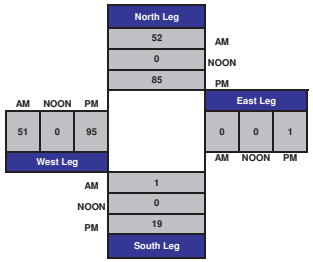
AM Peak Hour	08:00 - 09:00
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



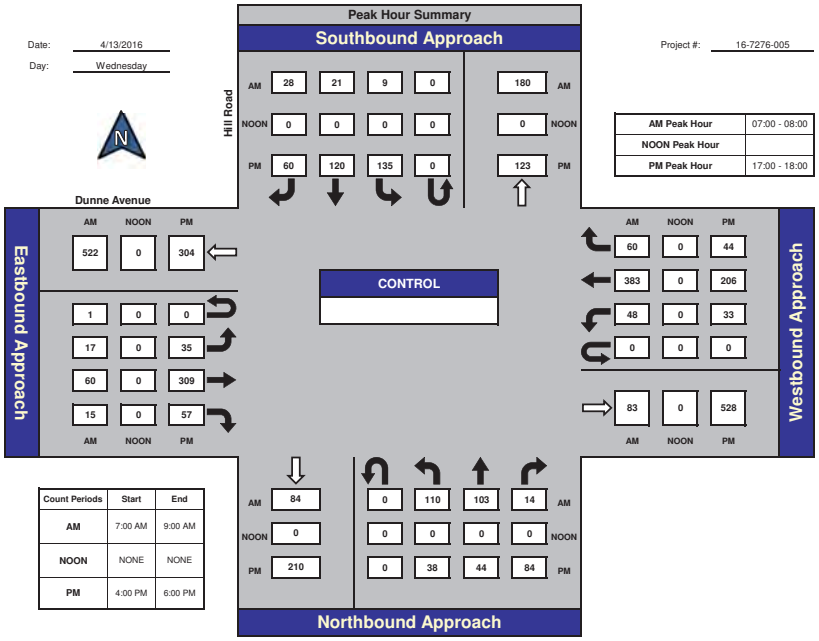
Total Volume Per Leg



Hill Road & Dunne Avenue

Date: 4/13/2016
Day: Wednesday

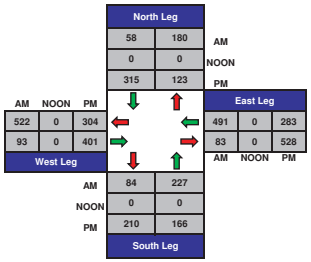
Project #: 16-7276-005



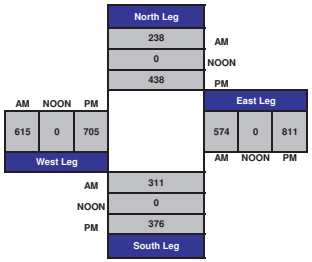
AM Peak Hour	07:00 - 08:00
NOON Peak Hour	
PM Peak Hour	17:00 - 18:00

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



APPENDIX C

LEVEL OF SERVICE WORKSHEETS

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	195	27	18	211	42	11
Future Vol, veh/h	195	27	18	211	42	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	217	30	20	234	47	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	254	0	-	0	600	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1311	-	-	-	464	911
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1311	-	-	-	386	911
Mov Cap-2 Maneuver	-	-	-	-	386	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	527	-

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1311	-	-	-	386	911
HCM Lane V/C Ratio	0.165	-	-	-	0.121	0.013
HCM Control Delay (s)	8.3	0	-	-	15.6	9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0.4	0

Intersection	
Int Delay, s/veh	8.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	20	49	38	8	221	16
Future Vol, veh/h	20	49	38	8	221	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	57	44	9	257	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	80	0	150	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1518	-	842	1016
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1518	-	818	1016
Mov Cap-2 Maneuver	-	-	-	-	818	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	829	-	-	1518	-
HCM Lane V/C Ratio	0.332	-	-	0.029	-
HCM Control Delay (s)	11.5	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	34	1	4	2	0	42
Future Vol, veh/h	34	1	4	2	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	1	5	2	0	49

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	49	0	129	1	1	-
Stage 1	-	-	80	-	-	-
Stage 2	-	-	49	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1558	-	762	1084	1622	-
Stage 1	-	-	828	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1558	-	0	1084	1622	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	7.2	8.3	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	1558	-	1084	1622	-
HCM Lane V/C Ratio	0.025	-	0.006	-	-
HCM Control Delay (s)	7.4	0	8.3	0	-
HCM Lane LOS	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	38	111	335	188	62	46
Future Vol, veh/h	38	111	335	188	62	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	142	429	241	79	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	671	0	-	0	790	550
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	919	-	-	-	359	535
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	919	-	-	-	338	535
Mov Cap-2 Maneuver	-	-	-	-	338	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	401
HCM Lane V/C Ratio	0.053	-	-	-	0.345
HCM Control Delay (s)	9.1	0	-	-	18.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.5

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	17	156	0	9	31	0	492	18
Future Vol, veh/h	0	17	156	0	9	31	0	492	18
Peak Hour Factor	0.92	0.94	0.94	0.92	0.94	0.94	0.92	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	166	0	10	33	0	523	19
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	9	17.9
HCM LOS	A	A	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	96%	0%	23%
Vol Thru, %	0%	10%	78%
Vol Right, %	4%	90%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	510	173	40
LT Vol	492	0	9
Through Vol	0	17	31
RT Vol	18	156	0
Lane Flow Rate	543	184	43
Geometry Grp	1	1	1
Degree of Util (X)	0.701	0.245	0.066
Departure Headway (Hd)	4.652	4.79	5.569
Convergence, Y/N	Yes	Yes	Yes
Cap	776	745	639
Service Time	2.703	2.843	3.64
HCM Lane V/C Ratio	0.7	0.247	0.067
HCM Control Delay	17.9	9.4	9
HCM Lane LOS	C	A	A
HCM 95th-tile Q	5.8	1	0.2

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	35	0	0	1	0	40
Future Vol, veh/h	35	0	0	1	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	0	0	1	0	49

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	49	0	25	135	-	0
Stage 1	-	-	0	86	-	-
Stage 2	-	-	25	49	-	-
Critical Hdwy	4.12	-	6.42	6.52	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	5.52	-	-
Follow-up Hdwy	2.218	-	3.518	4.018	-	-
Pot Cap-1 Maneuver	1558	-	991	756	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	998	854	-	-
Platoon blocked, %		-			-	-
Mov Cap-1 Maneuver	1558	-	963	0	-	-
Mov Cap-2 Maneuver	-	-	963	0	-	-
Stage 1	-	-	-	0	-	-
Stage 2	-	-	998	0	-	-

Approach	EB	NB	SB
HCM Control Delay, s	7.4		0
HCM LOS		-	

Minor Lane/Major Mvmt	NBLn1	EBL	EBR	SBT	SBR
Capacity (veh/h)	-	1558	-	-	-
HCM Lane V/C Ratio	-	0.028	-	-	-
HCM Control Delay (s)	-	7.4	-	-	-
HCM Lane LOS	-	A	-	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Hill Road & Dunne Ave

10/18/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	60	15	48	383	181	110	311	14	92	96	28
Future Volume (vph)	18	60	15	48	383	181	110	311	14	92	96	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1762	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.69	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1280	1863	1583	985	1762	1504
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	62	16	50	399	189	115	324	15	96	100	29
RTOR Reduction (vph)	0	0	12	0	0	140	0	0	9	0	2	15
Lane Group Flow (vph)	19	63	4	50	399	49	115	324	6	96	101	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	0.8	10.6	10.6	1.8	11.6	11.6	18.6	18.6	18.6	18.6	18.6	18.6
Effective Green, g (s)	0.8	10.6	10.6	1.8	11.6	11.6	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.02	0.24	0.24	0.04	0.26	0.26	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	31	842	377	71	922	412	535	778	661	411	736	628
v/s Ratio Prot	0.01	0.02		c0.03	c0.11			c0.17			0.06	
v/s Ratio Perm			0.00			0.03	0.09		0.00	0.10		0.01
v/c Ratio	0.61	0.07	0.01	0.70	0.43	0.12	0.21	0.42	0.01	0.23	0.14	0.02
Uniform Delay, d1	21.7	13.1	12.9	21.1	13.7	12.6	8.3	9.1	7.6	8.4	8.0	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.9	0.0	0.0	27.1	0.3	0.1	0.9	1.6	0.0	1.3	0.4	0.1
Delay (s)	52.6	13.2	13.0	48.2	14.0	12.7	9.2	10.8	7.6	9.7	8.4	7.6
Level of Service	D	B	B	D	B	B	A	B	A	A	A	A
Approach Delay (s)		20.8			16.3			10.3			8.9	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	44.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 TWSC
1: Half Road & Mission View Drive 10/18/2016

Intersection	
Int Delay, s/veh	10

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	90	30	40	36	231	202
Future Vol, veh/h	90	30	40	36	231	202
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	111	37	49	44	285	249

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	94	0	-	0	331	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1500	-	-	-	664	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1500	-	-	-	614	990
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1500	-	-	-	614	990
HCM Lane V/C Ratio	0.074	-	-	-	0.464	0.252
HCM Control Delay (s)	7.6	0	-	-	15.8	9.9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	2.5	1

HCM 2010 TWSC
2: Elm Road & Half Road 10/18/2016

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	24	237	23	20	56	21
Future Vol, veh/h	24	237	23	20	56	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	276	27	23	65	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	303	0	243	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1258	-	745	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1258	-	729	878
Mov Cap-2 Maneuver	-	-	-	-	729	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	925	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	764	-	-	1258	-
HCM Lane V/C Ratio	0.117	-	-	0.021	-
HCM Control Delay (s)	10.3	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	4	3	1	0	40
Future Vol, veh/h	39	4	3	1	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	4	3	1	0	43

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	43	0	132	4	4	-
Stage 1	-	-	89	-	-	-
Stage 2	-	-	43	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1566	-	759	1080	1618	-
Stage 1	-	-	821	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1566	-	0	1080	1618	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	8.3	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	1566	-	1080	1618	-
HCM Lane V/C Ratio	0.027	-	0.004	-	-
HCM Control Delay (s)	7.4	0	8.3	0	-
HCM Lane LOS	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	25	135	69	47	220	38
Future Vol, veh/h	25	135	69	47	220	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	159	81	55	259	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	-	0	327	109
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1448	-	-	-	667	945
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	652	945
Mov Cap-2 Maneuver	-	-	-	-	652	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1448	-	-	-	683
HCM Lane V/C Ratio	0.02	-	-	-	0.444
HCM Control Delay (s)	7.5	0	-	-	14.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	28	327	0	41	22	0	94	21
Future Vol, veh/h	0	28	327	0	41	22	0	94	21
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	30	352	0	44	24	0	101	23
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	8.2	8.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	82%	0%	65%
Vol Thru, %	0%	8%	35%
Vol Right, %	18%	92%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	115	355	63
LT Vol	94	0	41
Through Vol	0	28	22
RT Vol	21	327	0
Lane Flow Rate	124	382	68
Geometry Grp	1	1	1
Degree of Util (X)	0.168	0.401	0.089
Departure Headway (Hd)	4.89	3.778	4.736
Convergence, Y/N	Yes	Yes	Yes
Cap	733	954	757
Service Time	2.921	1.791	2.759
HCM Lane V/C Ratio	0.169	0.4	0.09
HCM Control Delay	8.9	9.3	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	2	0.3

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	42	5	10	0	4	52
Future Vol, veh/h	42	5	10	0	4	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	7	13	0	5	68

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	74	0	39	185	-	0
Stage 1	-	-	0	111	-	-
Stage 2	-	-	39	74	-	-
Critical Hdwy	4.12	-	6.42	6.52	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	5.52	-	-
Follow-up Hdwy	2.218	-	3.518	4.018	-	-
Pot Cap-1 Maneuver	1526	-	973	709	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	983	833	-	-
Platoon blocked, %		-			-	-
Mov Cap-1 Maneuver	1526	-	938	0	-	-
Mov Cap-2 Maneuver	-	-	938	0	-	-
Stage 1	-	-	-	0	-	-
Stage 2	-	-	983	0	-	-

Approach	EB	NB	SB
HCM Control Delay, s	6.7	8.9	0
HCM LOS		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBR	SBT	SBR
Capacity (veh/h)	938	1526	-	-	-
HCM Lane V/C Ratio	0.014	0.036	-	-	-
HCM Control Delay (s)	8.9	7.4	-	-	-
HCM Lane LOS	A	A	-	-	-
HCM 95th %tile Q(veh)	0	0.1	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	309	57	33	206	40	38	40	84	163	145	60
Future Volume (vph)	35	309	57	33	206	40	38	40	84	163	145	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1759	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.64	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1200	1863	1583	1356	1759	1504
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	39	347	64	37	231	45	43	45	94	183	163	67
RTOR Reduction (vph)	0	0	50	0	0	35	0	0	54	0	2	34
Lane Group Flow (vph)	39	347	14	37	231	10	43	45	40	183	168	26
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	1.8	9.8	9.8	1.8	9.8	9.8	18.7	18.7	18.7	18.7	18.7	18.7
Effective Green, g (s)	1.8	9.8	9.8	1.8	9.8	9.8	18.7	18.7	18.7	18.7	18.7	18.7
Actuated g/C Ratio	0.04	0.22	0.22	0.04	0.22	0.22	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	72	791	354	72	791	354	512	795	675	578	750	642
v/s Ratio Prot	c0.02	c0.10		0.02	0.07			0.02			0.10	
v/s Ratio Perm			0.01			0.01	0.04		0.03	c0.14		0.02
v/c Ratio	0.54	0.44	0.04	0.51	0.29	0.03	0.08	0.06	0.06	0.32	0.22	0.04
Uniform Delay, d1	20.6	14.6	13.3	20.6	14.1	13.3	7.5	7.4	7.4	8.3	8.0	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.4	0.0	6.1	0.2	0.0	0.3	0.1	0.2	1.4	0.7	0.1
Delay (s)	28.7	15.0	13.4	26.6	14.3	13.3	7.8	7.5	7.5	9.8	8.6	7.4
Level of Service	C	B	B	C	B	B	A	A	A	A	A	A
Approach Delay (s)		16.0			15.6			7.6			9.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	43.8	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	40.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 TWSC
1: Half Road & Mission View Drive 10/18/2016

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	198	43	18	218	59	19
Future Vol, veh/h	198	43	18	218	59	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	220	48	20	242	66	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	262	0	-	0	629	141
Stage 1	-	-	-	-	141	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1302	-	-	-	446	907
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	368	907
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1302	-	-	-	368	907
HCM Lane V/C Ratio	0.169	-	-	-	0.178	0.023
HCM Control Delay (s)	8.3	0	-	-	16.9	9.1
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0.6	0.1

HCM 2010 TWSC
2: Elm Road & Half Road 10/18/2016

Intersection	
Int Delay, s/veh	8.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	36	66	38	8	228	16
Future Vol, veh/h	36	66	38	8	228	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	77	44	9	265	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	119	0	178	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1469	-	812	980
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1469	-	788	980
Mov Cap-2 Maneuver	-	-	-	-	788	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	798	-	-	1469	-
HCM Lane V/C Ratio	0.356	-	-	0.03	-
HCM Control Delay (s)	12	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	34	9	4	2	0	42
Future Vol, veh/h	34	9	4	2	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	10	5	2	0	49

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	49	0	139	10	10	-
Stage 1	-	-	90	-	-	-
Stage 2	-	-	49	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1558	-	752	1071	1610	-
Stage 1	-	-	820	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1558	-	732	1071	1610	-
Mov Cap-2 Maneuver	-	-	732	-	-	-
Stage 1	-	-	799	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	9.4	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	1558	-	818	1610	-
HCM Lane V/C Ratio	0.025	-	0.009	-	-
HCM Control Delay (s)	7.4	0	9.4	0	-
HCM Lane LOS	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	38	111	335	195	79	46
Future Vol, veh/h	38	111	335	195	79	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	142	429	250	101	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	679	0	-	0	794	554
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	913	-	-	-	357	532
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	913	-	-	-	336	532
Mov Cap-2 Maneuver	-	-	-	-	336	-
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	913	-	-	-	389
HCM Lane V/C Ratio	0.053	-	-	-	0.412
HCM Control Delay (s)	9.2	0	-	-	20.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	34	156	0	9	46	0	492	25
Future Vol, veh/h	0	34	156	0	9	46	0	492	25
Peak Hour Factor	0.92	0.94	0.94	0.92	0.94	0.94	0.92	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	36	166	0	10	49	0	523	27
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.8	9.3	19.3
HCM LOS	A	A	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	95%	0%	16%
Vol Thru, %	0%	18%	84%
Vol Right, %	5%	82%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	517	190	55
LT Vol	492	0	9
Through Vol	0	34	46
RT Vol	25	156	0
Lane Flow Rate	550	202	59
Geometry Grp	1	1	1
Degree of Util (X)	0.723	0.275	0.091
Departure Headway (Hd)	4.733	4.897	5.619
Convergence, Y/N	Yes	Yes	Yes
Cap	759	728	631
Service Time	2.794	2.964	3.708
HCM Lane V/C Ratio	0.725	0.277	0.094
HCM Control Delay	19.3	9.8	9.3
HCM Lane LOS	C	A	A
HCM 95th-tile Q	6.3	1.1	0.3

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	48	0	0	1	0	40
Future Vol, veh/h	48	0	0	1	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	0	0	1	0	49

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	49	0	25	168	-	0
Stage 1	-	-	0	119	-	-
Stage 2	-	-	25	49	-	-
Critical Hdwy	4.12	-	6.42	6.52	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	5.52	-	-
Follow-up Hdwy	2.218	-	3.518	4.018	-	-
Pot Cap-1 Maneuver	1558	-	991	725	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	998	854	-	-
Platoon blocked, %		-			-	-
Mov Cap-1 Maneuver	1558	-	953	0	-	-
Mov Cap-2 Maneuver	-	-	953	0	-	-
Stage 1	-	-	-	0	-	-
Stage 2	-	-	998	0	-	-

Approach	EB	NB	SB
HCM Control Delay, s	7.4		0
HCM LOS		-	

Minor Lane/Major Mvmt	NBLn1	EBL	EBR	SBT	SBR
Capacity (veh/h)	-	1558	-	-	-
HCM Lane V/C Ratio	-	0.038	-	-	-
HCM Control Delay (s)	-	7.4	-	-	-
HCM Lane LOS	-	A	-	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Hill Road & Dunne Ave

10/18/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	60	15	48	383	181	110	311	14	92	96	28
Future Volume (vph)	25	60	15	48	383	181	110	311	14	92	96	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1762	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.69	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1280	1863	1583	985	1762	1504
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	26	62	16	50	399	189	115	324	15	96	100	29
RTOR Reduction (vph)	0	0	12	0	0	140	0	0	9	0	2	15
Lane Group Flow (vph)	26	63	4	50	399	49	115	324	6	96	101	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	0.8	10.6	10.6	1.8	11.6	11.6	18.6	18.6	18.6	18.6	18.6	18.6
Effective Green, g (s)	0.8	10.6	10.6	1.8	11.6	11.6	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.02	0.24	0.24	0.04	0.26	0.26	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	31	842	377	71	922	412	535	778	661	411	736	628
v/s Ratio Prot	0.01	0.02		c0.03	c0.11			c0.17			0.06	
v/s Ratio Perm			0.00			0.03	0.09		0.00	0.10		0.01
v/c Ratio	0.84	0.07	0.01	0.70	0.43	0.12	0.21	0.42	0.01	0.23	0.14	0.02
Uniform Delay, d1	21.8	13.1	12.9	21.1	13.7	12.6	8.3	9.1	7.6	8.4	8.0	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	95.1	0.0	0.0	27.1	0.3	0.1	0.9	1.6	0.0	1.3	0.4	0.1
Delay (s)	116.9	13.2	13.0	48.2	14.0	12.7	9.2	10.8	7.6	9.7	8.4	7.6
Level of Service	F	B	B	D	B	B	A	B	A	A	A	A
Approach Delay (s)		38.8			16.3			10.3			8.9	
Approach LOS		D			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	44.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 TWSC
1: Half Road & Mission View Drive 10/18/2016

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	98	30	56	53	238	205
Future Vol, veh/h	98	30	56	53	238	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	121	37	69	65	294	253

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	135	0	-	0	381	102
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1449	-	-	-	621	953
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	568	953
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	703	-

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1449	-	-	-	568	953
HCM Lane V/C Ratio	0.083	-	-	-	0.517	0.266
HCM Control Delay (s)	7.7	0	-	-	17.9	10.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	3	1.1

HCM 2010 TWSC
2: Elm Road & Half Road 10/18/2016

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	24	244	23	36	73	21
Future Vol, veh/h	24	244	23	36	73	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	284	27	42	85	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	312	0	265	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	95	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1248	-	724	874
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	929	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1248	-	708	874
Mov Cap-2 Maneuver	-	-	-	-	708	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	739	-	-	1248	-
HCM Lane V/C Ratio	0.148	-	-	0.021	-
HCM Control Delay (s)	10.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	4	11	1	0	40
Future Vol, veh/h	39	4	11	1	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	4	12	1	0	43

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	43	0	132	4	4	-
Stage 1	-	-	89	-	-	-
Stage 2	-	-	43	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1566	-	759	1080	1618	-
Stage 1	-	-	821	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1566	-	0	1080	1618	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	8.4	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	1566	-	1080	1618	-
HCM Lane V/C Ratio	0.027	-	0.012	-	-
HCM Control Delay (s)	7.4	0	8.4	0	-
HCM Lane LOS	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0	0	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	25	135	69	64	227	38
Future Vol, veh/h	25	135	69	64	227	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	159	81	75	267	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	156	0	-	0	337	119
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	4.12	-	-	-	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	6.12	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1424	-	-	-	617	933
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1424	-	-	-	607	933
Mov Cap-2 Maneuver	-	-	-	-	607	-
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1424	-	-	-	639
HCM Lane V/C Ratio	0.021	-	-	-	0.488
HCM Control Delay (s)	7.6	0	-	-	15.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.7

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	43	327	0	48	39	0	94	21
Future Vol, veh/h	0	43	327	0	48	39	0	94	21
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	46	352	0	52	42	0	101	23
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.7	8.4	9.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	82%	0%	55%
Vol Thru, %	0%	12%	45%
Vol Right, %	18%	88%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	115	370	87
LT Vol	94	0	48
Through Vol	0	43	39
RT Vol	21	327	0
Lane Flow Rate	124	398	94
Geometry Grp	1	1	1
Degree of Util (X)	0.171	0.424	0.123
Departure Headway (Hd)	4.985	3.836	4.741
Convergence, Y/N	Yes	Yes	Yes
Cap	718	943	757
Service Time	3.021	1.85	2.767
HCM Lane V/C Ratio	0.173	0.422	0.124
HCM Control Delay	9.1	9.7	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	2.1	0.4

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	42	5	10	0	4	65
Future Vol, veh/h	42	5	10	0	4	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	7	13	0	5	86

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	91	0	48	202	-	0
Stage 1	-	-	0	111	-	-
Stage 2	-	-	48	91	-	-
Critical Hdwy	4.12	-	6.42	6.52	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	5.42	5.52	-	-
Follow-up Hdwy	2.218	-	3.518	4.018	-	-
Pot Cap-1 Maneuver	1504	-	962	694	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	974	820	-	-
Platoon blocked, %		-			-	-
Mov Cap-1 Maneuver	1504	-	926	0	-	-
Mov Cap-2 Maneuver	-	-	926	0	-	-
Stage 1	-	-	-	0	-	-
Stage 2	-	-	974	0	-	-

Approach	EB	NB	SB
HCM Control Delay, s	6.7	8.9	0
HCM LOS		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBR	SBT	SBR
Capacity (veh/h)	926	1504	-	-	-
HCM Lane V/C Ratio	0.014	0.037	-	-	-
HCM Control Delay (s)	8.9	7.5	-	-	-
HCM Lane LOS	A	A	-	-	-
HCM 95th %tile Q(veh)	0	0.1	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	309	57	33	206	40	38	40	84	163	145	67
Future Volume (vph)	35	309	57	33	206	40	38	40	84	163	145	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1757	1504
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.64	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1199	1863	1583	1356	1757	1504
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	39	347	64	37	231	45	43	45	94	183	163	75
RTOR Reduction (vph)	0	0	50	0	0	35	0	0	54	0	3	38
Lane Group Flow (vph)	39	347	14	37	231	10	43	45	40	183	168	29
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	1.8	9.8	9.8	1.8	9.8	9.8	18.7	18.7	18.7	18.7	18.7	18.7
Effective Green, g (s)	1.8	9.8	9.8	1.8	9.8	9.8	18.7	18.7	18.7	18.7	18.7	18.7
Actuated g/C Ratio	0.04	0.22	0.22	0.04	0.22	0.22	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	72	791	354	72	791	354	511	795	675	578	750	642
v/s Ratio Prot	c0.02	c0.10		0.02	0.07			0.02			0.10	
v/s Ratio Perm			0.01			0.01	0.04		0.03	c0.14		0.02
v/c Ratio	0.54	0.44	0.04	0.51	0.29	0.03	0.08	0.06	0.06	0.32	0.22	0.04
Uniform Delay, d1	20.6	14.6	13.3	20.6	14.1	13.3	7.5	7.4	7.4	8.3	8.0	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.4	0.0	6.1	0.2	0.0	0.3	0.1	0.2	1.4	0.7	0.1
Delay (s)	28.7	15.0	13.4	26.6	14.3	13.3	7.8	7.5	7.5	9.8	8.6	7.5
Level of Service	C	B	B	C	B	B	A	A	A	A	A	A
Approach Delay (s)		16.0			15.6			7.6			8.9	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	43.8	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	40.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Appendix E
Response to Comments

Response to Public Comments

The Draft IS/MND was sent to the State Clearinghouse for a 30-day public review from March 1, 2017 to April 3, 2017. A letter was received from the State Clearinghouse stating that the project has complied with the State Clearinghouse review requirements for draft environmental documents under CEQA. Six comment letters were received on the proposed project from five agencies and a local resident as follows: Morgan Hill Unified School District, California Department of Fish and Wildlife (CDFW), County of Santa Clara Roads and Airports Department, Regional Water Quality Control Board, California Department of Water Resources (DWR) and Doug Muirhead, Resident of the City of Morgan Hill.

This Appendix presents responses the comment letter received on the Draft IS/MND during the review period. The Santa Clara Valley Water District Board of Directors will consider the information contained in the final document, as well as comments and responses on the draft document. All changes to the Draft IS/MND are described in Table 1. Response to Comment Letters, which includes the nature of the comment, the response and references any changes to the Draft IS/MND.

Comment Letter A
Morgan Hill Unified School District

MORGAN HILL UNIFIED SCHOOL DISTRICT
15600 Concord Circle
Morgan Hill, CA 95037
(408) 201-6085

March 17, 2017

Santa Clara Valley Water District
Erika Carpenter
5750 Alameda Expressway
San Jose, CA 95118

Dear Ms. Carpenter:

Thank you for the opportunity to review and comment on the Mitigated Negative Declaration (MND) regarding the Main and Madrone Pipeline Restoration project. The proposed project will be implemented around Live Oak High School located at 1505 East Main Avenue in Morgan Hill.

We offer the following comments on the MND:

Section 2 Project Description- Figure 4 Site Plan illustrates the pipeline running east to west along Half Road which is on the northern end of Live Oak High School. Work along Half Road will impact school bus routes and student traffic in the morning (7:30am-8:30am) and afternoon hours (2:30pm-3:30pm). A-1

There is also a fire lane that runs north to south just east of the campus with an entrance/exit along Half Road which will need to be accessible at all times.

Along Half Road just east of the baseball fields is Live Oak's Agricultural facility. Throughout the year, the students raise and house livestock such as pigs, steer, sheep, etc. that they then show and sell at the local fairs. Loud noises can cause stress to some of these animals which in turn can make them sick in many ways such as affecting their weight gain and overall health. Having large equipment directly next to their pens could also scare them enough that they try to escape their pens causing injury. Minimizing the noise around the facility should help mitigate these dangers to the animals. A-2

Should you have any questions regarding the above mentioned concerns, I can be reached directly at espinosaa@mhusd.org or 408/201-6087.

Sincerely,

Anessa Espinosa
Director of Facilities

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

March 29, 2017

Ms. Erika Carpenter
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Dear Ms. Carpenter:

Subject: Main and Madrone Pipeline Restoration Project, Draft Initial Study and Mitigated Negative Declaration, SCH #2017032011, City of Morgan Hill, Santa Clara County

The California Department of Fish and Wildlife (CDFW) has reviewed the Santa Clara Valley Water District's (SCVWD) draft Initial Study and Mitigated Negative Declaration (MND) for the Main and Madrone Pipeline Restoration Project (Project), pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines. The proposed Project is located east of U.S. Highway 101, south of Cochrane Road and north of Half Road, in the City of Morgan Hill and in unincorporated Santa Clara County. The draft MND was received in our office on March 6, 2017.

CDFW is a Trustee Agency with responsibility under CEQA §15386 for commenting on projects that could impact fish, plant and wildlife resources. CDFW is also considered a Responsible Agency under CEQA §15381 if a project requires discretionary approval, such as under the California Endangered Species Act (CESA), the Native Plant Protection Act, the Lake and Streambed Alteration Agreement (LSAA), or other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife trust resources. B-1

PROJECT DESCRIPTION

The objective of the Project is to repair the Main and Madrone pipelines and to expand the capacity of the pipelines to convey 37 cubic feet per second (cfs) of water from Anderson Reservoir and the Santa Clara Conduit to the Main Avenue Percolation Ponds and Madrone Channel, to meet the current and future groundwater demands in the area. Project activities would occur within Cochrane Road, East Main Avenue, and Half Road along the Main Avenue and Madrone Pipelines. B-2

The Project would be implemented along three major segments:

- Segment 1 (Main Avenue Pipeline): 2,800 linear feet of 16-inch diameter pipe from the Anderson Reservoir outlet to the Cochrane Road and Half Road intersection would be replaced with 36-inch pipe.
- Segment 2 (Main Avenue Pipeline): 4,860 linear feet of 16-inch, 18-inch, and 24-inch diameter pipe from the Cochrane Road and Half Road intersection to the Main Avenue Percolation Ponds would be replaced with 30-inch pipe. Some of the existing pipeline would be abandoned in place.

- Segment 3 (Madrone Pipeline): 6,300 linear feet of 24-inch diameter and 30-inch diameter pipe from the Cochrane Road and Half Road intersection to the Madrone Channel would be replaced with 30-inch pipe.

In addition, underground utility vaults would be constructed at the end of the pipelines; the existing discharge pipes at the Main Avenue Percolation Ponds and the Madrone Channel would be upgraded to include an energy dissipater; and an existing chemical feed station on Cochrane Road would be demolished and reconstructed north of Main Avenue near the Main Avenue turnout. The new chemical feed station would occupy approximately 299 square feet. B-2 (cont.)

The segments of the pipelines to be removed would be excavated and replaced using the open trench method, which would involve lowering 40-foot long pipe barrels into the trench using a hydraulic excavator. Each pipe would be aligned and joined to the previously installed pipe in the trench. Any water encountered during dewatering of the pipelines or encountered groundwater would be pumped and discharged to agricultural fields, adjacent storm drains, or to the Madrone Channel or Main Avenue Percolation Ponds. Affected roadways would be repaved upon Project completion. Construction is anticipated to occur between July 2017 and November 2018.

BIOLOGICAL RESOURCES

The draft MND has disclosed that the Project would occur mainly within existing paved roadways, but that agricultural land (consisting of grain, row-crop, hay and pasture, and disked/short-term fallowed land) and artificially-constructed pond and channel habitat would also be impacted. Species identified in the MND that may be potentially impacted by the Project include the federally and state threatened California tiger salamander (*Ambystoma californiense*); the federally threatened and state species of special concern California red-legged frog (*Rana draytonii*); the state candidate tricolored blackbird (*Agelaius tricolor*); the state fully protected white-tailed kite (*Elanus leucurus*); and the state species of special concern western pond turtle (*Emys marmorata*), American badger (*taxidea taxus*) and pallid bat (*Antrozous pallidus*). B-3

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist SCVWD in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

Pages 8, 10, and 12 – Energy Dissipaters and Chemical Feed Station: The Project Description should include a more complete description of the types of energy dissipaters and of the chemical feed station that will be constructed as part of the Project. B-4

Page 11 – Staging Areas: Please describe whether each of the staging areas are paved or composed of gravel and/or soil. If they are unpaved, please indicate whether they contain small mammal burrows. Please be advised that small mammal burrows may serve as upland habitat for California tiger salamanders. Since the draft MND discloses the possibility (albeit low potential) for California tiger salamander to be present in the Project area and surrounding areas, the document should discuss the potential impacts of staging activities to this species. CDFW recommends that the MND be revised to describe in more detail potential impacts to B-5

California tiger salamander. If staging areas or any portion of the Project area are determined to be suitable upland habitat for California tiger salamander, the MND should include mitigation for any loss of salamander habitat.

Page 11 – Dewatering: The document states that if dewatering of the pipeline is necessary and/or if groundwater is encountered within the planned depth of excavation during Project activities, the dewatered water would be discharged to adjacent agricultural fields, storm drains, the Madrone Channel, or to the Main Avenue Percolation Ponds. Please be advised that discharge of water to adjacent agricultural fields containing small mammal burrows could impact California tiger salamanders if they are present within those burrows. The draft MND should be revised to discuss potential impacts and describe avoidance measures associated with Project dewatering activities as they pertain to California tiger salamander. B-6

Page 50 – Western Pond Turtle: The Draft MND states that although the likelihood of presence of western pond turtle in the Project area is low, individual turtles may be harmed or killed. The document also states that the species is not abundant in the region, and that loss of individuals could reduce the viability of the population to the extent that it could be eliminated. The document goes on to describe various measures (including SCVWD Best Management Practices and avoidance and minimization measures from the Santa Clara Valley Habitat Plan) that would be implemented, ensuring that the impact to western pond turtle would be less than significant. However, it is not clear how these measures will reduce the potential impacts to western pond turtle to a less-than-significant level given the small population in this area. B-7

Page 52 – Madrone Channel Spillways: CDFW recently issued an LSAA (1600-2016-0036-R3) to SCVWD for work to remove dam overflow pipes and construct concrete spillways at the crests of some of the dams within the Madrone Channel. Please confirm whether any of the work from the Project described in the draft MND will impact any of the work to be conducted under the recently issued LSAA. B-8

ENVIRONMENTAL DATA
CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. [Pub. Resources Code, § 21003, subd. (e)]. Accordingly, please report any special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_FieldSurveyForm.pdf. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp. B-9

FILING FEES
The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. B-10

FILING FEES
The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish and Game Code, § 711.4; Pub. Resources Code, § 21089).

B-10 (cont.)

CONCLUSION
CDFW appreciates the opportunity to comment on the draft MND to assist SCVWD in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Ms. Mayra Molina, Environmental Scientist, at (707) 944-5596 or Mayra.Molina@wildlife.ca.gov; or Ms. Brenda Blinn, Senior Environmental Scientist (Supervisory), at (707) 944-5541 or Brenda.Blinn@wildlife.ca.gov.

Sincerely,

Scott Wilson

Scott Wilson
Regional Manager
Bay Delta Region

From: D. Muirhead
To: Erika Carpenter
Subject: Comments on IS/MND Main and Madrone Pipeline Restoration Project
Date: Friday, March 31, 2017 12:30:42 PM

TO:
Erika Carpenter <ecarpenter@valleywater.org>
Environmental Planner
Santa Clara Valley Water District

Subject:
Comments on
Main and Madrone Pipeline Restoration Project
Initial Study and Mitigated Negative Declaration
Project No. 26564001 FEBRUARY 2017

Comments submitted by Doug Muirhead,
member of the public and resident of Morgan Hill

Under Purpose of the Initial Study you state
"to provide the public, responsible agencies and trustee agencies with information about the potential environmental effects of the Main and Madrone Pipeline Restoration Project"

Further, you state
"This MND is intended to allow the public to fully understand the environmental implications of the project and incorporates the CEQA process to achieve District goals, which include the following:
* Providing public accountability for projects it proposes or approves;
* Ensuring interagency cooperation during project planning;
* Allowing full public review and participation in project planning; and
* Integrating environmental considerations into its decisions."

C-1

Under Public Review Process you state
"This IS/MND will be circulated to local, state and federal agencies, interested organizations and individuals who may wish to review and provide comments on the project description, the proposed mitigation measures or other aspects of the report."

You have chosen to omit from the project description two impacts to Morgan Hill and the surrounding communities.

C-2

1) Each of the groundwater recharge facilities will be out of operation for a period of time.

2) Morgan Hill recreation trail, which uses the District maintenance road along the Madrone Channel, is not identified. Anderson Lake Recreation Area and the Coyote Creek Parkway are identified.

C-3

Background for Comment #1:

SECTION 2: PROJECT DESCRIPTION
Project Background
The average annual managed recharge for the Madrone Channel is 5,300 AFY

C-4

and 2,700 AFY for the Main Avenue Percolation Ponds for an average total of 8,000 AFY. The Integrated Water Resources Planning Study recommends providing an additional 5,670 AFY of groundwater recharge to meet future demands for the Llagas subbasin.
Project Elements
The proposed project would be implemented along three major segments:
* Segment 1 (Main Avenue Pipeline): 2,800 linear feet of 16-inch diameter pipe from the Anderson Reservoir outlet to the Cochrane Road and Half Road intersection will be replaced with 36-inch pipe.
* Segment 2 (Main Avenue Pipeline): 4,860 linear feet of 16-inch, 18-inch, and 24-inch diameter pipe from the Cochrane Road and Half Road intersection to the Main Avenue Percolation Ponds will be replaced with 30-inch pipe. Some of the existing pipeline will be abandoned in place.
* Segment 3 (Madrone Pipeline): 6,300 linear feet of 24-inch diameter and 30-inch diameter pipe from the Cochrane Road and Half Road intersection to the Madrone Channel will be replaced with 30-inch pipe.

Construction Activities
Construction would occur over a 17-month period beginning in approximately July 2017 and concluding in November 2018.... Construction phases would include: excavation and pipeline demolition; material hauling; pipeline installation and backfill; and paving.

C-4 (Cont.)

SECTION 4: ENVIRONMENTAL EVALUATION
ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED
Environmental factors not considered to be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" include:
Hydrology / Water Quality

+---------+---------+---------+---------+

Comment #1:

At a recent Santa Clara Valley Water District special Board meeting to discuss Water Supply Capital Improvement projects, I asked if the Main and Madrone Pipeline Restoration Project would disrupt groundwater recharge operations.
According to a response I received from District Senior Engineer Joel Jenkins:
* During Segment 2 (Main Avenue Ponds), the Madrone Channel recharge facility will be operational.
* During Segment 3 (Madrone Channel), the Main Avenue Ponds recharge facility will be operational.

C-5

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED
Not checked as potentially affected
Hydrology and Water Quality
b) depletion of groundwater supplies
is Less than Significant Impact.

The IS/MND does not identify that each of the groundwater recharge facilities will be out of operation for a period of time.
What is the anticipated length of time for non-operation of each facility and the corresponding loss of recharge?

C-6

+---------+---------+---------+---------+---------+---------+

Background for Comment #2:

SECTION 2: PROJECT DESCRIPTION
Project Planning
District staff determined that the recommended alternative would be the standard open-trench construction method.
Project Elements
In addition, underground utility vaults would be constructed at the end of the pipelines; the existing discharge pipes at the Main Avenue Percolation Ponds and the Madrone Channel would be upgraded to include an energy dissipater.

C-7

SECTION 3: ENVIRONMENTAL SETTING
Surrounding Land Uses
Surrounding uses include primarily low-density residential and agricultural uses, as well as Live Oak High School.
Physical Environment
The project area consists of existing pipelines located within paved roadways along Cochrane Road, East Main Avenue, and Half Road. The Madrone Pipeline runs primarily along Half Road from Cochrane Road to the District's Madrone Channel.

C-8

SECTION 4: ENVIRONMENTAL EVALUATION
ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED
Environmental factors not considered to be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" include:
Air Quality
Recreation/ Public Services
Transportation / Traffic

C-9

3. AIR QUALITY
Sensitive Receptors
The nearest sensitive receptors include single family residential homes that are located approximately 40 feet from the proposed limits of construction, as well as Live Oak High School.

C-10

14. PUBLIC SERVICES
d) Parks? No Impact
e) Other public facilities? No Impact
ENVIRONMENTAL SETTING
Nearby parks include the Anderson Lake Recreation Area located to the east and the Coyote Creek Parkway located to the northeast of the project area.

C-11

15. RECREATION
ENVIRONMENTAL SETTING
Parks in the vicinity of the project area include the Anderson Lake Recreation Area located to the east and the Coyote Creek Parkway located to the northeast of the project area.
DISCUSSION
Use of Anderson Lake County Park is not anticipated to directly affect recreational users during construction activities. Park users may be temporarily disturbed by construction activities (e.g., noise, traffic).

16. TRANSPORTATION/TRAFFIC
a) all modes of transportation including non-motorized travel including pedestrian and bicycle paths

C-12

f) Conflict with plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?
ENVIRONMENTAL SETTING
The TIA analyzed intersections.
DISCUSSION
a) Less than Significant Impact.
Construction activities would result in additional traffic on the roadway network.
f) Less Than Significant Impact.
Construction could temporarily affect pedestrian/bicycle routes that are located in proximity to the pipeline alignment (i.e. road shoulders).

C-12
(Cont.)

+---------+---------+---------+---------+

Comment #2:

At a recent Santa Clara Valley Water District special Board meeting to discuss Water Supply Capital Improvement projects, I asked if the Morgan Hill recreation trail, which uses the District maintenance road along the Madrone Channel, would be impacted.
Based on aerial views and commentary in the IS/MND, the open-trench construction will cross the road/trail. It appears that the connection to provide for future additional groundwater recharge west of U.S. Highway 101, is located within the service road right-of-way.
It is not clear if the vault for the pressure regulating valve and energy dissipater or its construction will also impact the road/trail.

C-13

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED
Not checked as potentially affected
Air Quality
Recreation / Public Services
Transportation / Traffic

While you identify Anderson Lake Recreation Area and the Coyote Creek Parkway, you do not include the Morgan Hill recreation trail, which uses the District maintenance road along the Madrone Channel.
The trail segment is a key part of our preferred route between downtown and the County Coyote Creek trail. It is featured in our newly-revised Bikeways, Trails, Parks and Recreation Master Plan. The City has just installed newer, larger, and taller signs to identify the entry points to the trail.

To what degree will trail access be unavailable, and when will the construction-related effects on air quality impact trail users?

C-14

+---------+---------+---------+---------+---------+---------+
Thank you for your consideration,
Doug Muirhead, resident of Morgan Hill
---------+---------+---------+---------+---------+----

Comment Letter D
County of Santa Clara Roads and Airports Department

From: Boyd, David R
To: Joel Jenkins
Cc: Erika Carpenter; Marisela Benitez
Subject: ** County comments for file# 160603 - Construction TIA - East Main Ave., Cochrane & Half Rd. (SCVWD) (04-03-2017) **
Date: Monday, April 03, 2017 1:35:08 PM

Hi Joel –

We have received and reviewed your site for the Construction TIA – East Main Ave., Cochrane & Half Rd. for the above reference project, and the following are our comments:

1. Please use TRAFFIX for Level-of-Service calculation, not synchro. D-1
2. The Traffic Analysis needs to include Main/Conduit intersection. D-2

Please Advise, and Many Thanks,

David R.L. Boyd, P.E.
Associate Civil Engineer
Land Development & Permits
County of Santa Clara
101 Skyport Drive
San Jose, CA 95110
Phone (408) 573-2450 Fax (408)441-0276
david.boyd@rda.sccgov.org
www.countyroads.org

Comment Letter E
Regional Water Quality Control Board

Erika Carpenter

From: Glendening, Susan@Waterboards <susan.glendening@waterboards.ca.gov>
Sent: Tuesday, April 04, 2017 10:07 AM
To: Erika Carpenter
Subject: RE: Main and Madrone Pipeline Restoration Project - SCH: 2017032011

Thank you for checking in. My only comment is that the MND should reference the District's water rights for the water to be transferred from the Anderson Reservoir, since the pipeline capacities will be increased. E-1

Thank you,
Susan

Susan Glendening
Environmental Specialist
San Francisco Estuary Partnership/
San Francisco Regional Water Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
510.622.2462
Susan.Glendening@waterboards.ca.gov

Comment Letter F
Department of Water Resources, Division of Safety of Dams
Page 1 of 2

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY — EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

APR - 4 2017

Ms. Erika Carpenter, Environmental Planner III
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

SCH #2017032011, Initial Study/Mitigated Negative Declaration for Main and Madrone Pipeline Project Restoration Project, Project No. 26564001
Santa Clara County

Dear Ms. Carpenter:

We have reviewed the Initial Study/Mitigated Negative Declaration for the above referenced project, which includes the installation of a new pipeline segment that will connect to the downstream end of the low-level outlet at Anderson Reservoir.

Leroy Anderson Dam, No. 72-9, which impounds Anderson Reservoir, is under the jurisdiction of this Division for dam safety. Based on the information included in the Initial Study/Mitigated Negative Declaration, it is not clear what impacts the new pipeline connection will have on the low-level outlet and the downstream toe of the dam. Please contact Area Engineer Bill Vogler to provide a more detailed description of the activities involved to determine if an application and approval from this Division is required. F-1

If it is determined the work will affect the safety of the dam, an application, together with plans, specifications, and the appropriate filing fee must be filed with the Division of Safety of Dams. All dam safety related issues must be resolved prior to approval of the application, and the work must be performed under the direction of a Civil Engineer registered in California.

If you have any questions or require additional information, please contact Mr. Vogler at (916) 227-4625 or me at (916) 227-4631.

Sincerely,

Andrew J. Mangney, Regional Engineer
Central Region
Field Engineering Branch
Division of Safety of Dams

cc: (See attached list.)

cc: Ms. Nadell Gayou, Engineer
Department of Water Resources
Division of Environmental Services
901 P Street, 2nd Floor
Sacramento, California 95814

Governor's Office of Planning and Research
State Clearinghouse
Post Office Box 3044
Sacramento, California 95812-3044

Mr. James Fiedler, Chief Operating Officer
Water Utility Enterprise
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118-3686

Mr. Frank Blackett, Regional Engineer
Federal Energy Regulatory Commission
100 First Street, Suite 2300
San Francisco, California 94105-3084

Table 1. Responses to Comment Letters

Subject of Comment	Response	Text Change	Reference Pages
Comment A – Anessa Espinosa, Morgan Hill Unified School District			
Comment A-1: Effects to the School Bus Routes and Traffic in the Morning and Afternoon at Live Oak High School During Construction and the Fire lane adjacent to Half Road	Comment noted regarding construction activities near Live Oak High School and the existing fire lane. Work along Half Road has been scheduled in the Summer months in 2018 to avoid potential conflicts with school traffic and impacts on students at Live Oak High School. Access to the fire lane on the campus would be maintained during construction activities. The District will coordinate with the Morgan Hill Unified School District prior to and during construction activities.	None	N/A
Comment A-2: Noise Impacts to the Live Oak High School Agricultural Facility	Comment noted regarding the agricultural facility at Live Oak High School and the potential for the project to create noise levels that would affect the livestock at the facility. Mitigation Measure NOI-1 in the Final IS/MND requires that the District prepare a noise reduction plan to reduce noise levels at sensitive receptors, such as Live Oak High School, within the project area. Implementation of this measure would ensure that potential impacts to Live Oak High School and the farm animals at the agricultural facility are less than significant.	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
Comment B – Scott Wilson, Regional Manager, Bay Delta Region, California Department of Fish and Wildlife			
Comment B-1: CDFW's responsibility as Trustee Agency and Responsible Agency Under CEQA	Comment noted regarding CDFW's responsibility as a Trustee Agency under CEQA to comment on the IS/MND and as a responsible agency if the project requires a Lake or Streambed Alteration Agreement. No response is necessary.	None	N/A
Comment B-2: Summary of Project Description	Commenter summarizes the project description in the IS/MND. No response is necessary.	None	N/A
Comment B-3: Summary of Species that Could Be Affected by the Project	Commenter summarizes the biological resources that may occur within the project area. No response is necessary.	None	N/A
Comment B-4: Request for Energy Dissipaters and Chemical Feed Station	Commenter requests that the project description include more information on the energy dissipaters and chemical feed station. The chemical feed station would be approximately 300 square feet and would be comprised of pre-fabricated concrete materials. It would include a 500-gallon chemical tank, a metering pump, calibration cylinder, and associated equipment and would be connected to the existing East Main Avenue Turnout and to a chemical injection vault located within East Main Avenue with PVC pipe. An energy dissipater would be constructed at the Madrone Channel. Approximately 500 square feet of rip-rap	The following changes have been made to Page 8 of the Project Description: In addition, underground utility vaults would be constructed at the end of the pipelines; the existing discharge pipes at the ~~Main Avenue Percolation Ponds and the~~ Madrone Channel would be upgraded to include an energy dissipater; and an existing chemical feed	Page 8 of the Final IS/MND

Subject of Comment	Response	Text Change	Reference Pages
	would be required on the bank of Madrone Channel to prevent erosion for construction of the energy dissipater. The energy dissipater would not be required at the Main Avenue Ponds. The project description in the Final IS/MND has been updated to include these additional details and the site plans for both the chemical feed station and the energy dissipater have been incorporated.	station on Cochrane Road would be demolished and reconstructed north of Main Avenue near the Main Avenue turnout. The new chemical feed station would occupy approximately ~~299~~ 300 square feet and would be comprised of pre-fabricated concrete materials. It would include a 500-gallon chemical tank, a metering pump, calibration cylinder, and associated equipment and would be connected to the existing East Main Avenue Turnout and to a chemical injection vault located within East Main Avenue with PVC pipe. The proposed energy dissipater at Madrone Channel would require approximately 500 square feet of rip-rap on the bank of Madrone Channel to prevent erosion.	

Subject of Comment	Response	Text Change	Reference Pages
		The site plan for the chemical feed station is included as Figure 4c: Chemical Feed Station Site Plan and the site plan for the energy dissipater is included as Figure 4d: Energy Dissipater at Madrone Channel. Full size plans for the proposed project are available for review at the Santa Clara Valley Water District at 5750 Almaden Expressway, San Jose, CA 95118.	
Comment B-5: Staging Areas and the Potential for California Tiger Salamander (CTS)	Commenter requests information as to whether the staging areas are paved or unpaved. As noted in the second paragraph on Page 14 of the Final IS/MND, each of the staging areas consist of agricultural land and are unpaved. The Final IS/MND has been updated to address agricultural activities that currently occur within the project area. However, due to the regular disturbance of these sites for agricultural uses (e.g. tilling, etc.) they are not anticipated to contain small mammal burrows. As noted on page 52 of the Final IS/MND, the *Santa Clara Valley Habitat Plan* (VHP) maps portion of the project area as suitable upland dispersal and refugial habitat for CTS and	The first sentence in second paragraph on Page 11 of the Project Description has been modified as follows: The proposed project includes three staging areas within the project area on active and fallow agricultural land that has been previously disturbed by agricultural activities (e.g. tiling) and/or used for equipment storage for farming equipment.	Page 14 of the Final IS/MND

Subject of Comment	Response	Text Change	Reference Pages
	there is some potential for this species to occur in the grain, row crop, and pasture, disked/short-term fallow habitat in Staging Area 1 near the Anderson Lake County Park. However, as noted in the IS/MND, due to the regular disturbance of the agricultural fields at this staging area and the remainder of the staging areas, these areas do not provide large numbers of subterranean refugia for CTS. CTS is a covered species in the VHP. Project-specific impacts to covered species under the VHP, including CTS, are reported to the Santa Clara Valley Habitat Agency through a streamlined permit process. Potential take of CTS is authorized through the Santa Clara Valley Habitat Agency's incidental take permit. To certify take for covered species, activities associated with the proposed project must be implemented consistent with conditions and AMMs outlined in the VHP. The VHP does not provide species-level avoidance and minimization measures for CTS. Nevertheless, the project would comply with all VHP conditions including Condition 3: Maintain Hydrologic Conditions and Protect Water Quality, which requires implementation of numerous aquatic avoidance and minimization measures. The Avoidance and	The fourth paragraph on page 52 has been modified as follows: The VHP maps portions of the project area as suitable upland dispersal and refugial habitat for CTS and there is some potential for the species to occur in the grain, row-crop, hay, and pasture, disked/short-term fallowed habitat in Staging Area 1 near the Anderson Lake County Park. However, due to the regular disturbance of the agricultural fields, these areas <u>and all three staging areas</u> do not provide large numbers of subterranean refugia for CTS.	

Subject of Comment	Response	Text Change	Reference Pages
	Minimization Measures (AMMs) required as part of this condition support the biological goals and objectives of the VHP and reduce the potential for adverse impacts on covered species, including CTS. The proposed project also incorporates District BMPs as described on pages 52 and 53 of the Final IS/MND. The District would pay VHP impact fees that would contribute to the overall conservation program of the VHP, which includes habitat acquisition, restoration, preservation and management targeted at CTS and other covered species.		
Comment B-6: Dewatering to agricultural fields and potential effects to CTS	Comment noted regarding the potential dewatering of the pipeline to adjacent agricultural fields. The District would use existing facilities as much as possible (e.g. Main Avenue Ponds, Madrone Channel or existing storm drains) for dewatering activities. If dewatering of the pipeline is required near agricultural fields at specific low points along the pipeline alignment, a sump pump would be used to remove the water (estimated at approximately 400 gallons at any one location). This volume of water would infiltrate in the soil within a few hours. Due to the regular disturbance of surrounding agricultural fields and the small amount of water discharged, the potential to affect CTS within the project area is considered low. As noted in Response B-5 above, CTS is a	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	covered species under the VHP and project-specific activities would be reported to the Santa Clara Valley Habitat Agency through a streamlined permit process. Potential take of CTS is authorized through the Santa Clara Valley Habitat Agency's incidental take permit. See Response to Comment B-5 for additional information on the required Conditions and BMPs to reduce the potential to harm CTS within the project area.		
Comment B-7: Potential Impacts to Western Pond Turtle	Comment noted regarding the project's impacts to Western Pond Turtle (WPT). WPT is a covered species in the VHP. Project-specific impacts to covered species under the VHP, including WPT, are reported to the Santa Clara Valley Habitat Agency through a streamlined permit process. Potential take of WPT is authorized through the Santa Clara Valley Habitat Agency's incidental take permit. As noted on in Response to Comment B-6 above, to certify take for covered species such as WPT, activities associated with the proposed project must be implemented consistent with conditions and AMMs outlined in the VHP. The VHP does not provide species-level avoidance and minimization measures for WPT. Nevertheless, the project would comply with all VHP conditions including Condition 3: Maintain Hydrologic	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	Conditions and Protect Water Quality, which requires implementation of numerous AMMs. The AMMs for construction source and treatment are designed to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. The proposed project also incorporates District BMPs as described page 54 of the Final IS/MND. With implementation of these measures, the impact to WPT would be considered less than significant.		
Comment B-8: Madrone Channel Dams Spillway	The Madrone Channel Dams Spillway would be located on Madrone Channel, south of East Dunne Avenue in Morgan Hill. The Madrone Channel Dams Spillway Installation Project includes the removal of dam overflow pipes and the installation of concrete spillways at the crests of dams #6, #7, #8, and #9. The work within the Madrone Channel for the proposed project would be occurring adjacent to Half Road, which is over 1,000 feet north of the Madrone Channel Dams Spillway project. Therefore, work on the Madrone Channel Dam Spillway Installation Project is not anticipated to affect construction activities associated with the proposed project.	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
Comment B-9: Environmental Data	Commenter requests that any special status species and natural communities detected during project surveys be included in the California Natural Diversity Database (CNDDB). No special status species were noted during site surveys for the biological resources report prepared for the project. However, if any special status species are reported during construction monitoring, they will be reported to CDFW.	None	N/A
Comment B-10: CDFW Filing Fees	Commenter notes that the project would have an impact on fish and wildlife and would require payment of environmental filing fees. Once the MND is adopted by our Board of Directors and a Notice of Determination (NOD) has been filed, the District will pay the environmental filing fees.	None	N/A
Comment Letter C, Doug Muirhead, Resident of the City of Morgan Hill			
Comment C-1: Project Description	Commenter reiterates the project description noted in the IS/MND. No response is necessary.	None	N/A
Comment C-2: Groundwater Recharge Facilities	Commenter notes that the project description does not include a description of how each of the groundwater facilities will be out of operation for a period during construction. Construction of the proposed project would be phased over the one-year construction term to minimize disruption to groundwater recharge operations. During this time, at	Page 8 of the IS/MND has been updated to reflect what recharge facilities would in operation during construction activities as follows:	Page 8 of the Final IS/MND

Subject of Comment	Response	Text Change	Reference Pages
	least one groundwater recharge facility would be in operation as described below: • During the construction of Segment 1, both the Main Avenue Ponds and Madrone Channel recharge facilities will be operational. • During construction of Segment 2, the Madrone Channel recharge facility will be operational. • During construction of Segment 3, the Main Avenue Ponds recharge facility will be operational. A summary of which groundwater recharge facility would be in operation during construction activities has been added to project description in the IS/MND.	**Project Elements** The proposed project would be implemented along three major segments as described below (see Figure 4a: Site Plan): • Segment 1 (Main Avenue Pipeline): 2,800 linear feet of 16-inch diameter pipe from the Anderson Reservoir outlet to the Cochrane Road and Half Road intersection will be replaced with 36-inch pipe. During construction of Segment 1, both the Main Avenue Ponds and Madrone Channel recharge facilities will be operational. • Segment 2 (Main Avenue Pipeline): 4,860 linear feet of 16-inch, 18-inch, and 24-inch diameter pipe from the Cochrane Road and Half Road intersection to the Main Avenue	

Subject of Comment	Response	Text Change	Reference Pages
		Percolation Ponds will be replaced with 30-inch pipe. Some of the existing pipeline will be abandoned in place. <u>During construction of Segment 2, the Madrone Channel recharge facility will be operational.</u> • Segment 3 (Madrone Pipeline): 6,300 linear feet of 24-inch diameter and 30-inch diameter pipe from the Cochrane Road and Half Road intersection to the Madrone Channel will be replaced with 30-inch pipe. <u>During construction of Segment 3, the Main Avenue Ponds recharge facility will be operational.</u>	
<u>Comment C-3</u>: Madrone Channel Recreational Trail	Comment noted that the IS/MND does not reference the Madrone trail in the project description. References to nearby recreational facilities are included in Section 15: Recreation of the Final IS/MND. The	The first paragraph of the Recreation section of the IS/MND has been modified as follows:	Page 95 of the Final IS/MND

Subject of Comment	Response	Text Change	Reference Pages
	trail/maintenance road adjacent to Madrone Channel is identified as a "County Trail Within Other Public Lands (e.g. flood control projects)" on the *County Trails Map*. In addition, per the *Draft Bikeways, Trails, Parks and Recreation Master Plan* (City of Morgan Hill February 2017), the trail adjacent to Madrone Channel is identified as a natural surface trail pursuant to a joint-use agreement with the District. The Final IS/MND has been updated to note this trail within the project area.	Parks in the vicinity of the project area include the Anderson Lake Recreation Area located to the east and the Coyote Creek Parkway located to the northeast of the project area. The trail along Madrone Channel is identified as a recreational trail on the *County of Santa Clara Trails Master Plan* (County of Santa Clara 1995) and in the *City of Morgan Hill Draft Bikeways, Trails, Parks and Recreation Master Plan* (City of Morgan Hill 2017).	
Comment C-4: Project Description	Commenter reiterates the project background, project description, and environmental factors potentially affected by the project as noted in the IS/MND. No response is necessary.	None	N/A
Comment C-5: Disruption to Groundwater Recharge Operations	Comment noted regarding the disruption of groundwater recharge operations. As noted in Response to Comment A-2, construction of the proposed project would be phased to minimize disruption to groundwater recharge operations and during the one year duration of the project, at least one groundwater recharge facility would be in operation at any one time.	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
Comment C-6: Short-Term Effects to Groundwater	Comment noted regarding that each of the groundwater recharge facilities will be out of commission for a period during construction of the proposed project. Construction of the proposed project would be phased to minimize impact to groundwater recharge operations as described above in Response C-2. The District's planned phased construction sequence would ensure impacts to managed recharge are minimized and that the Llagas Subbasin would not be severely affected. Initial estimates are that managed recharge of the Llagas Subbasin will be reduced by approximately 14 percent during construction. The groundwater subbasin is in good condition and water levels have recovered significantly after several years of unprecedented drought, in large part driven by the community's response to water use reduction and the District's sustainable groundwater management practices over the years. The planned facility outages, phased throughout construction would reduce the managed recharge to the Llagas Subbasin but is not expected to result in a substantial depletion of groundwater supplies. As described in the Final IS/MND, the proposed project would restore the pipelines	The discussion under subsection "b" in the Hydrology and Water Quality Section of the Final IS/MND has been revised to expand on the short-term impacts to groundwater during construction activities. Please see the changes on pages 81 and 82 of the Final IS/MND.	Page 81 and 82 of the Final IS/MND

Subject of Comment	Response	Text Change	Reference Pages
	to full capacity and make the system more reliable to meet current and future subbasin recharge demands. The pipeline network will provide greater operational flexibility for the upper Llagas Subbasin recharge program in re-establishing the connection to Anderson Reservoir to diversify and ensure the long-term supply of local and imported water for groundwater recharge purposes.		
Comment C-7: Project Description	Commenter reiterates the project description. No response is necessary.	None	N/A
Comment C-8: Environmental Setting	Commenter reiterates the environmental setting. No response is necessary.	None	N/A
Comment C-9: Environmental Evaluation	Commenter reiterates the environmental factors potentially affected. No response is necessary.	None	N/A
Comment C-10: Sensitive Receptors	Commenter reiterates the sensitive receptors noted in the IS/MND. No response is necessary.	None	N/A
Comment C-11: Public Services and Recreation	Commenter reiterates the analysis in the IS/MND in the public services and recreation subsections in Section 4 of the IS/MND. No response is necessary.	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
Comment C-12: Transportation/Traffic Section	Commenter reiterates the analysis in the Transportation/Traffic section of the IS/MND. No response is necessary.	None	N/A
Comment C-13: Location of the Connection to Provide for Future Groundwater Recharge and the Vault for the Pressure Regulating Valve and Energy Dissipater	Commenter requests clarification as to whether construction activities would cross the Madrone Channel maintenance road/trail. As noted on page 105 in the Transportation/Traffic section of the Final IS/MND, construction activities could temporarily affect pedestrian/bicycle routes located in proximity to the pipeline alignment, which would include the maintenance road/trail adjacent to the Madrone Channel. Disruption of access to the pedestrian trails may only occur during periods of active construction. However, if required, the contractor would be required by the District to establish protected passage-ways during both working and non-working hours like work in other metropolitan areas. In addition, pursuant to District BMP TR-1, which is incorporated as part of the proposed project, the District would incorporate fences, barriers, lights, flagging, guards, and signs (as appropriate) as required by the City of Morgan Hill and/or the County of Santa Clara, which has jurisdiction over the project area, to give adequate warning to the public. As there would only be a minor disruption to pedestrian facilities during construction and	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	no permanent changes would occur, impacts would be considered less than significant.		
Comment C-14: Effects to the "Morgan Hill Recreational Trail" and Air Quality Impacts to Trail Users	The trail/maintenance road adjacent to Madrone Channel is identified as a "County Trail Within Other Public Lands (e.g. flood control projects)" on the County Trails Map. In addition, per the *City of Morgan Hill Draft Bikeways, Trails, Parks and Recreation Master Plan* (City of Morgan Hill 2017), the trail adjacent to Madrone Channel is identified as a natural surface trail pursuant to a joint-use agreement with the District. Per the District's joint use agreement with the City of Morgan Hill, the District granted permission to the City of Morgan Hill operation of the Madrone Channel trail to operate a pedestrian and/or bicycle trail for public use. The Joint Use Agreement (Executed on November 15, 2011) allows the District to restrict access to the trail to perform non-emergency work, such as the proposed project. As noted in Response to Comment C-3, the Recreation section of the Final IS/MND has been modified to specifically include the Madrone Channel Maintenance Road/Trail. Please see Response C-13 above regarding potential impacts during construction activities to alternative transportation.	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	Short-term air quality emissions during construction activities are identified on page 42 and 43 of the Final IS/MND. To address the short-term emission of fugitive dust and equipment exhaust to surrounding sensitive receptors, the District would implement BMP AQ-1 (Dust Control Measures), which includes, but is not limited to the following measures: application of dust control measures including the watering of exposes surfaces; that all haul trucks are covered; and minimization of idling times of construction equipment.		
Comment Letter D, David Boyd, County of Santa Clara Roads and Airports Department			
Comment D-1: Use of Synchro Instead of TRAFFIX.	Comment noted regarding the use of the Synchro traffic model to assess the construction traffic associated with the proposed project. The District recognizes that TRAFFIX is the preferred modeling software used by the County and that there may be some differences between the two models. However, since all intersections are operating at acceptable levels of service with the addition of construction traffic, using TRAFFIX over Synchro is not anticipated to result in a significant change in the level of service during construction activities. Synchro was used in the construction traffic analysis because it uses the most recent Highway Capacity Manual (HCM) (2010).	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	In written correspondence on May 8, 2017 between Joel Jenkins, Senior Engineer with the District and David Boyd, Associate Civil Engineer with the County of Santa Clara Roads and Airports Department, the County has agreed that the District's use of Synchro for the proposed project is acceptable.		
Comment D-2: Inclusion of the Main Avenue/Conduit Road intersection	The Main Avenue and Conduit intersection is located south of the project area. As noted on page 98 and 102 of the IS/MND, the only trips that would originate south of the project area are employee commute trips. The analysis assumed that 40 percent of the approximately 25 employees (ten trips) would originate south of the project area. Based on the traffic distribution, no trips are associated with the Main Avenue and Conduit Intersection during construction activities.	None	N/A
Comment Letter E, Susan Glendenning, Environmental Specialist, Regional Water Quality Control Board			
Comment E-1: Reference the Water Rights for the Water to Be Transferred from the Anderson Reservoir since the Pipelines will be Increased.	The Main Avenue and Madrone Pipelines currently receives water from: 1) the Anderson Reservoir outlet and 2) the Santa Clara Conduit. Water from the Santa Clara Conduit is typically imported water from the San Felipe Division of the Central Valley Project. Water from the Anderson Reservoir outlet is comprised of the following: imported water stored in the Anderson Reservoir, Coyote Reservoir water that is passed	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	through or stored in Anderson Reservoir, or local water captured in Anderson Reservoir pursuant to the District's appropriate water rights. The project would be operated within the existing water rights and a petition for change will not be necessary.		
Comment Letter F, Andrew Mangney, Regional Engineer, California Department of Water Resources (DWR), Division of Safety of Dams			
Comment F-1: Potential Effects to the Low-Level Outlet and the Downstream Toe of Anderson Dam	Comment noted regarding whether the proposed project would affect the Anderson Dam low-level outlet and the downstream toe of the Dam, as well as the comment to contact the staff at the Division of Safety of Dams (DSOD) with DWR regarding the project. In written correspondence between Joel Jenkins, Senior Engineer with the District and Andrew Mangney, Regional Engineer with DSOD on March 17, 2017, the District explained that the project intends to connect to the downstream side of the existing 16-inch tee that is fed from the Anderson Dam outlet pipe and the Anderson Dam Force Main. This appurtenance (the 16-inch tee, isolation valves, and vault) was originally installed to feed the existing Main Avenue and Madrone Pipeline system. No other modifications are being made to the Dam Outlet facilities. The replacement of the existing Anderson Dam Outlet Facilities/Main Madrone Pipeline connection is not	None	N/A

Subject of Comment	Response	Text Change	Reference Pages
	anticipated to affect the outlet capacity of the Anderson Dam. On May 10, 2017, the District sent William Vogler with DSOD, the plans and profile sheets that depict the installation of the new pipeline segment that will connect to the downstream end of the low-level outlet at Anderson Dam. Based on their review, DSOD determined that there are no dam safety related issues associated with the project and no application would be required (Written communication between Joel Jenkins, Senior Engineer with the District and William Vogler with DSOD on May 17, 2017). Per the request of DSOD, the District will notify DSOD to confirm if they would like to perform inspections during construction activities between Station 2+00 and 5+00 of the proposed project.		