PROJECT REPORT

TO: ENVIRONMENTAL EVALUATION COMMITTEE **AGENDA DATE:January 27, 2022**

FROM: PLANNING & DEVELOPMENT SERVICES **AGENDA TIME 1:30 PM/ No. 2**

PROJECT TYPE: TR#00992 Miraluz Affordable Housing & State R. 86/Pitzer Rd. Intersection Improvement Project SUPERVISOR DISTRICT #2

LOCATION: 175 E. Correll Rd. APN: 054-601-016-000

Heber, CA PARCEL SIZE: +/- 16 Acres

GENERAL PLAN (existing) Heavy Residential per Heber Urban Area Plan GENERAL PLAN (proposed) N/A

ZONE (existing) R - 3 (Medium-Density Residential) ZONE (proposed) N/A

GENERAL PLAN FINDINGS ☒ CONSISTENT ☐ INCONSISTENT ☐ MAY BE/FINDINGS

PLANNING COMMISSION DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

PLANNING DIRECTORS DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

ENVIROMENTAL EVALUATION COMMITTEE DECISION: HEARING DATE: 01/27/2022

INITIAL STUDY: #22-0002

☐ NEGATIVE DECLARATION ☐ MITIGATED NEG. DECLARATION ☐ EIR

DEPARTMENTAL REPORTS / APPROVALS:

PUBLIC WORKS	☒ NONE	☐ ATTACHED
AG	☐ NONE	☒ ATTACHED
APCD	☐ NONE	☒ ATTACHED
E.H.S.	☐ NONE	☒ ATTACHED
FIRE / OES	☐ NONE	☒ ATTACHED
SHERIFF.	☒ NONE	☐ ATTACHED
OTHER	IID, Fort Yuma Quechan Indian Tribe, Caltrans, HPUD, see attached	

REQUESTED ACTION:

(See Attached)

☐ NEGATIVE DECLARATION
☐ MITIGATED NEGATIVE DECLARATION

Initial Study & Environmental Analysis
For:

TR #00992
Miraluz Affordable Housing and
State Route 86/Pitzer Road Intersection Improvement Project

Prepared By:

COUNTY OF IMPERIAL
Planning & Development Services Department
801 Main Street
El Centro, CA 92243
(442) 265-1736
www.icpds.com

January, 2022

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SECTION 1
INTRODUCTION

A. PURPOSE

This document is a ☐ policy-level, ☒ project level Initial Study #22-0002 for evaluation of potential environmental impacts resulting with the proposed Miraluz Affordable Housing Tract Map and State Route 86/Pitzer Road Intersection Improvement Project (Refer to Exhibit "A" & "B").

B. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REQUIREMENTS AND THE IMPERIAL COUNTY'S GUIDELINES FOR IMPLEMENTING CEQA

As defined by Section 15063 of the State California Environmental Quality Act (CEQA) Guidelines and Section 7 of the County's "CEQA Regulations Guidelines for the Implementation of CEQA, as amended", an **Initial Study** is prepared primarily to provide the Lead Agency with information to use as the basis for determining whether an Environmental Impact Report (EIR), Negative Declaration, or Mitigated Negative Declaration would be appropriate for providing the necessary environmental documentation and clearance for any proposed project.

☐ According to Section 15065, an **EIR** is deemed appropriate for a particular proposal if the following conditions occur:

- The proposal has the potential to substantially degrade quality of the environment.
- The proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The proposal has possible environmental effects that are individually limited but cumulatively considerable.
- The proposal could cause direct or indirect adverse effects on human beings.

☐ According to Section 15070(a), a **Negative Declaration** is deemed appropriate if the proposal would not result in any significant effect on the environment.

☐ According to Section 15070(b), a **Mitigated Negative Declaration** is deemed appropriate if it is determined that though a proposal could result in a significant effect, mitigation measures are available to reduce these significant effects to insignificant levels.

This Initial Study has determined that the proposed applications will not result in any potentially significant environmental impacts; and therefore, a Negative Declaration is deemed as the appropriate document to provide necessary environmental evaluations and clearance as identified hereinafter.

This Initial Study and Negative Declaration are prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code, Section 21000 et. seq.); Section 15070 of the State & County of Imperial's Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended (California Code of Regulations, Title 14, Chapter 3, Section 15000, et. seq.); applicable requirements of the County of Imperial; and the regulations, requirements, and procedures of any other responsible public agency or an agency with jurisdiction by law.

Pursuant to the County of Imperial Guidelines for Implementing CEQA, depending on the project scope, the County of Imperial Board of Supervisors, Planning Commission and/or Planning Director is designated the Lead Agency, in accordance with Section 15050 of the CEQA Guidelines. The Lead Agency is the public agency which has the

principal responsibility for approving the necessary environmental clearances and analyses for any project in the County.

C. INTENDED USES OF INITIAL STUDY AND NEGATIVE DECLARATION

This Initial Study and Negative Declaration are informational documents which are intended to inform County of Imperial decision makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed applications. The environmental review process has been established to enable public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The Initial Study and Negative Declaration, prepared for the project will be circulated for a period of 20 days (*30-days if submitted to the State Clearinghouse for a project of area-wide significance*) for public and agency review and comments. At the conclusion, if comments are received, the County Planning & Development Services Department will prepare a document entitled "Responses to Comments" which will be forwarded to any commenting entity and be made part of the record within 10-days of any project consideration.

D. CONTENTS OF INITIAL STUDY & NEGATIVE DECLARATION

This Initial Study is organized to facilitate a basic understanding of the existing setting and environmental implications of the proposed applications.

SECTION 1

I. INTRODUCTION presents an introduction to the entire report. This section discusses the environmental process, scope of environmental review, and incorporation by reference documents.

SECTION 2

II. ENVIRONMENTAL CHECKLIST FORM contains the County's Environmental Checklist Form. The checklist form presents results of the environmental evaluation for the proposed applications and those issue areas that would have either a potentially significant impact, potentially significant unless mitigation incorporated, less than significant impact or no impact.

PROJECT SUMMARY, LOCATION AND EVIRONMENTAL SETTINGS describes the proposed project entitlements and required applications. A description of discretionary approvals and permits required for project implementation is also included. It also identifies the location of the project and a general description of the surrounding environmental settings.

ENVIRONMENTAL ANALYSIS evaluates each response provided in the environmental checklist form. Each response checked in the checklist form is discussed and supported with sufficient data and analysis as necessary. As appropriate, each response discussion describes and identifies specific impacts anticipated with project implementation.

SECTION 3

III. MANDATORY FINDINGS presents Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

IV. PERSONS AND ORGANIZATIONS CONSULTED identifies those persons consulted and involved in

preparation of this Initial Study and Negative Declaration.

V. REFERENCES lists bibliographical materials used in preparation of this document.

VI. NEGATIVE DECLARATION – COUNTY OF IMPERIAL

VII. FINDINGS

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP) (IF ANY)

E. SCOPE OF ENVIRONMENTAL ANALYSIS

For evaluation of environmental impacts, each question from the Environmental Checklist Form is summarized and responses are provided according to the analysis undertaken as part of the Initial Study. Impacts and effects will be evaluated and quantified, when appropriate. To each question, there are four possible responses, including:

1. **No Impact:** A "No Impact" response is adequately supported if the impact simply does not apply to the proposed applications.

2. **Less Than Significant Impact:** The proposed applications will have the potential to impact the environment. These impacts, however, will be less than significant; no additional analysis is required.

3. **Potentially Significant Unless Mitigation Incorporated:** This applies where incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact".

4. **Potentially Significant Impact:** The proposed applications could have impacts that are considered significant. Additional analyses and possibly an EIR could be required to identify mitigation measures that could reduce these impacts to less than significant levels.

F. POLICY-LEVEL or PROJECT LEVEL ENVIRONMENTAL ANALYSIS

This Initial Study and Negative Declaration will be conducted under a ☐ policy-level, ☒ project level analysis. Regarding mitigation measures, it is not the intent of this document to "overlap" or restate conditions of approval that are commonly established for future known projects or the proposed applications. Additionally, those other standard requirements and regulations that any development must comply with, that are outside the County's jurisdiction, are also not considered mitigation measures and therefore, will not be identified in this document.

G. TIERED DOCUMENTS AND INCORPORATION BY REFERENCE

Information, findings, and conclusions contained in this document are based on incorporation by reference of tiered documentation, which are discussed in the following section.

1. Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

"Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared

for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

"Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Further, Section 15152(d) of the CEQA Guidelines states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

2. Incorporation By Reference

Incorporation by reference is a procedure for reducing the size of EIRs/MND and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or Negative Declaration relies on a broadly-drafted EIR for its evaluation of cumulative impacts of related projects (*Las Virgenes Homeowners Federation v. County of Los Angeles* [1986, 177 Ca.3d 300]). If an EIR or Negative Declaration relies on information from a supporting study that is available to the public, the EIR or Negative Declaration cannot be deemed unsupported by evidence or analysis (*San Francisco Ecology Center v. City and County of San Francisco* [1975, 48 Ca.3d 584, 595]). This document incorporates by reference appropriate information from the "Final Environmental Impact Report and Environmental Assessment for the "County of Imperial General Plan EIR" prepared by Brian F. Mooney Associates in 1993 and updates.

When an EIR or Negative Declaration incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

- The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines Section 15150[a]). The General Plan EIR and updates are available, along with this document, at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150[b]). These documents are available at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- These documents must summarize the portion of the document being incorporated by reference or briefly

describe information that cannot be summarized. Furthermore, these documents must describe the relationship between the incorporated information and the analysis in the tiered documents (CEQA Guidelines Section 15150[c]). As discussed above, the tiered EIRs address the entire project site and provide background and inventory information and data which apply to the project site. Incorporated information and/or data will be cited in the appropriate sections.

- These documents must include the State identification number of the incorporated documents (CEQA Guidelines Section 15150[d]). The State Clearinghouse Number for the County of Imperial General Plan EIR is SCH #93011023.

- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150[f]). This has been previously discussed in this document.

II. Environmental Checklist

1. **Project Title**: Miraluz Affordable Housing and State Route 86/Pitzer Road Intersection Improvement Project
2. **Lead Agency**: Imperial County Planning & Development Services Department
3. **Contact person and phone number**: Mariela Moran, Planner III, (442)265-1736
4. **Address**: 801 Main Street, El Centro CA, 92243
5. **E-mail**: marielamoran@co.imperial.ca.us
6. **Project location**: The Miraluz Affordable Housing project is proposed on a 16-acre site located at 175 E. Correll Road southwest of the Pitzer Road/ East Correll Road intersection in the town of Heber, unincorporated Imperial County, California (Assessor Parcel Number 054-601-016). The site is located within the Heber Area Plan in the townsite of Heber. The State Route 86/Pitzer Road improvements would generally extend 1,000 feet in each direction from the center of the existing intersection which is located approximately 2,000 feet south of the Miraluz site.
7. **Project sponsor's name and address**: Heber Meadows I, LP
   6339 Paseo Del Lago
   Carlsbad, CA 92011
   Contact: David Davis, Development Manager
8. **General Plan designation**: High Density Residential per Heber Specific Plan Area
9. **Zoning**: R-3 (Medium-High Density Residential Zone) and Public Right-of-Way
10. **Description of project**: As proposed, the proposed project would subdivide APN 054-601-016 into five lots for the purpose of constructing a phased affordable housing project:

Parcel 1: 2.96 Acres (Phase I)
Parcel 2: 2.89 Acres
Parcel 3: 2.96 Acres
Parcel 4: 3.37 Acres
Parcel 5: 3.47 Acres
Lot "A": 0. 60 Acres (for future access)

A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The Heber Meadows project was comprised of 86 acres located west of Pitzer Road, south of East Correll Road, east of the Union Pacific Railroad tracks and north of 6th Street. As approved, Heber Meadows consisted in the subdivision of an 85-acre project site. Sixteen acres (16) of the site were designated as multiple family housing (approximately 267 units), 48 acres of the site were designated for single-family residential development (219 lots) and 21 acres of the site were proposed as open space for park and storm-water detention uses. The current project site, identified as Lot "D" of Tract 00956, was initially environmentally assessed for 267 units as previously mentioned, however it was never developed.

A condition of approval associated with the Heber Meadows project required improvements to the SR-86/Pitzer Road intersection located approximately 2,000 feet south of the site. The northern Pitzer Road leg from SR-86 is currently closed. The southern Pitzer Road leg is stop controlled. The east/west movement is uncontrolled under existing conditions. Linscott, Law and Greenspan, Engineers (LLG) prepared an Intersection Control Evaluation (ICE) (March

2021) for the subject intersection. The analysis was prepared to objectively evaluate and screen intersection control alternatives. The intersection traffic control options which were assessed are minor-street stop, all-way stop, signalization, and roundabout control. The intersection control alternatives were analyzed using Year 2040 (Horizon Year) forecast traffic volumes including traffic generated by the planned Heber Meadows project. The recommended control is installation of a traffic signal with geometric improvements. The fourth (north) leg would be constructed at this intersection which will provide direct access from SR 86 to the north, connecting to East Correll Road. The following intersection geometry is proposed at the SR 86 / Pitzer Road intersection:

- Southbound: One left turn lane and one shared through / right-turn lane (New north leg)
- Westbound: One left turn lane, one through lane and one right-turn lane
- Northbound: One left turn lane and one shared through / right-turn lane
- Eastbound: One left turn lane and one shared through / right-turn lane

With these improvements, the intersection would complete the street network serving the project site and address operational deficiencies associated with project build out and cumulative traffic volumes.

The existing roadway would be widened within the existing County of Imperial right of way (ROW) along Pitzer Road and California Department of Transportation (Caltrans) ROW along SR 86. The study area is assumed to be a linear corridor approximately 1,000 feet in either direction from the center of the intersection and 100 feet in width or approximately 50 feet on either side where public access is permitted.

Because the Miraluz Affordable Housing Project would exceed the total number of units approved as part of the Heber Meadows project and improvements to the SR-86/Pitzer Road intersection were required as a condition of approval; and thus, not evaluated as part of the Heber Meadows project, both actions are evaluated herein as one standalone project.

Project construction is expected to begin in 2022 with Miraluz Phase I and the SR-86/Pitzer Road improvements completed in early 2023.

11. **Surrounding land uses and setting:** The project site is bordered by cultivated agricultural land to the north and east; single-family residential to the south (i.e., Heber Meadows) and the Heber Meadows (Jiggs Johnson) Neighborhood Park and vacant land west.

12. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.): Planning Commission, California Department of Transportation District 11 – Encroachment Permit for State Route 86 improvements.

13. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentially, etc.?

As part of the Cultural Resource Report research process, a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) was requested on February 23, 2021. The NAHC sent a response on March 9, 2021, stating that a search of the SLF was completed with positive results (i.e., sacred lands or resources important to Native Americans are recorded within the vicinity of the project APE). The letter recommended that the Torres-Martinez Desert Cahuilla Indians and the Ewiiaapaayp Band of Kumeyaay Indians be contacted for more information.

On March 9, 2021, letters were mailed to the NAHC-listed contacts describing the project and asking if they had knowledge regarding cultural resources of Native American origin within or near the APE. A letter was also emailed to Cultural Resources Director Michael Mirelez of the Torres-Martinez Desert Cahuilla Indians and Chairperson

Robert Pinto of the Ewiiaapaayp Band of Kumeyaay Indians on March 9, 2021.

On March 17, 2021, Quechan Indian Tribe Historic Preservation Officer H. Jill McCormick responded via email stating that the tribe had no comments regarding the project.

On March 17, 2021, Anza sent emails to remaining contacts with copies of the letters attached and providing an additional opportunity to comment or ask questions regarding the proposed undertaking.

On October 19, 2021, during ICPDS Second Request of comments of the proposed project we received comment letters from Viejas Band of Kumeyaay Indians ("Viejas") and La Posta Band of Mission Indians requesting monitoring, letters were incorporated in this document and will be Conditions of Approval of the proposed project.

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code, Section 21080.3.2). Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code, Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code, Section 21082.3 (c) contains provisions specific to confidentiality.

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

ENVIRONMENTAL EVALUATION COMMITTEE (EEC) DETERMINATION

After Review of the Initial Study, the Environmental Evaluation Committee has:

☐ Found that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Found 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.

☐ Found that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ Found 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.

☐ Found 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.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DE MINIMIS IMPACT FINDING: ☐ Yes ☐ No

EEC VOTES	YES	NO	ABSENT
PUBLIC WORKS	☐	☐	☐
ENVIRONMENTAL HEALTH SVCS	☐	☐	☐
OFFICE EMERGENCY SERVICES	☐	☐	☐
APCD	☐	☐	☐
AG	☐	☐	☐
SHERIFF DEPARTMENT	☐	☐	☐
ICPDS	☐	☐	☐

Jim Minnick, Director of Planning/EEC Chairman Date:

PROJECT SUMMARY

A. Project Location: The Miraluz Affordable Housing project is proposed on a 16-acre site located at 175 E. Correll Road southwest of the Pitzer Road/ East Correll Road intersection in the town of Heber, unincorporated Imperial County, California (Assessor Parcel Number 054-601-016). The site is located within the Heber Area Plan in the townsite of Heber. The State Route 86/Pitzer Road improvements would generally extend 1,000 feet in each direction from the center of the existing intersection which is located approximately 2,000 feet south of the Miraluz site.

B. Project Summary: The proposed project would subdivide APN 054-601-016 (16.22 Acres) into five lots for the purpose of constructing a phased affordable housing project. A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements. Proposed parcels area are listed as follows:

Parcel 1: 2.96 Acres (Phase I)
Parcel 2: 2.89 Acres
Parcel 3: 2.96 Acres
Parcel 4: 3.37 Acres
Parcel 5: 3.47 Acres
Lot "A": 0. 60 Acres (for future access)

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The current project site was part of the larger project area but was never developed.

A condition of approval associated with the Heber Meadows project required improvements to the SR-86/Pitzer Road intersection located approximately 2,000 feet south of the site. The northern Pitzer Road leg from SR-86 is currently closed. The southern Pitzer Road leg is stop controlled. The east/west movement is uncontrolled under existing conditions. The recommended improvements would install a new traffic signal with geometric improvements. The fourth (north) leg would be constructed at this intersection which will provide direct access from SR 86 to the north, connecting to East Correll Road.

C. Environmental Setting: The project site is vacant and partially disturbed. The site is bordered by cultivated agricultural land to the north and east; single-family residential to the south (i.e., Heber Meadows) and the Heber Meadows (Jiggs Johnson) Neighborhood Park and vacant land west. The SR-86/Pitzer Road intersection is bordered by agricultural land and an irrigation canal to the northeast and southeast. An farm equipment business is located to the northwest with other commercial uses to the west. Single-family residences are located to the west along the south side of SR-86.

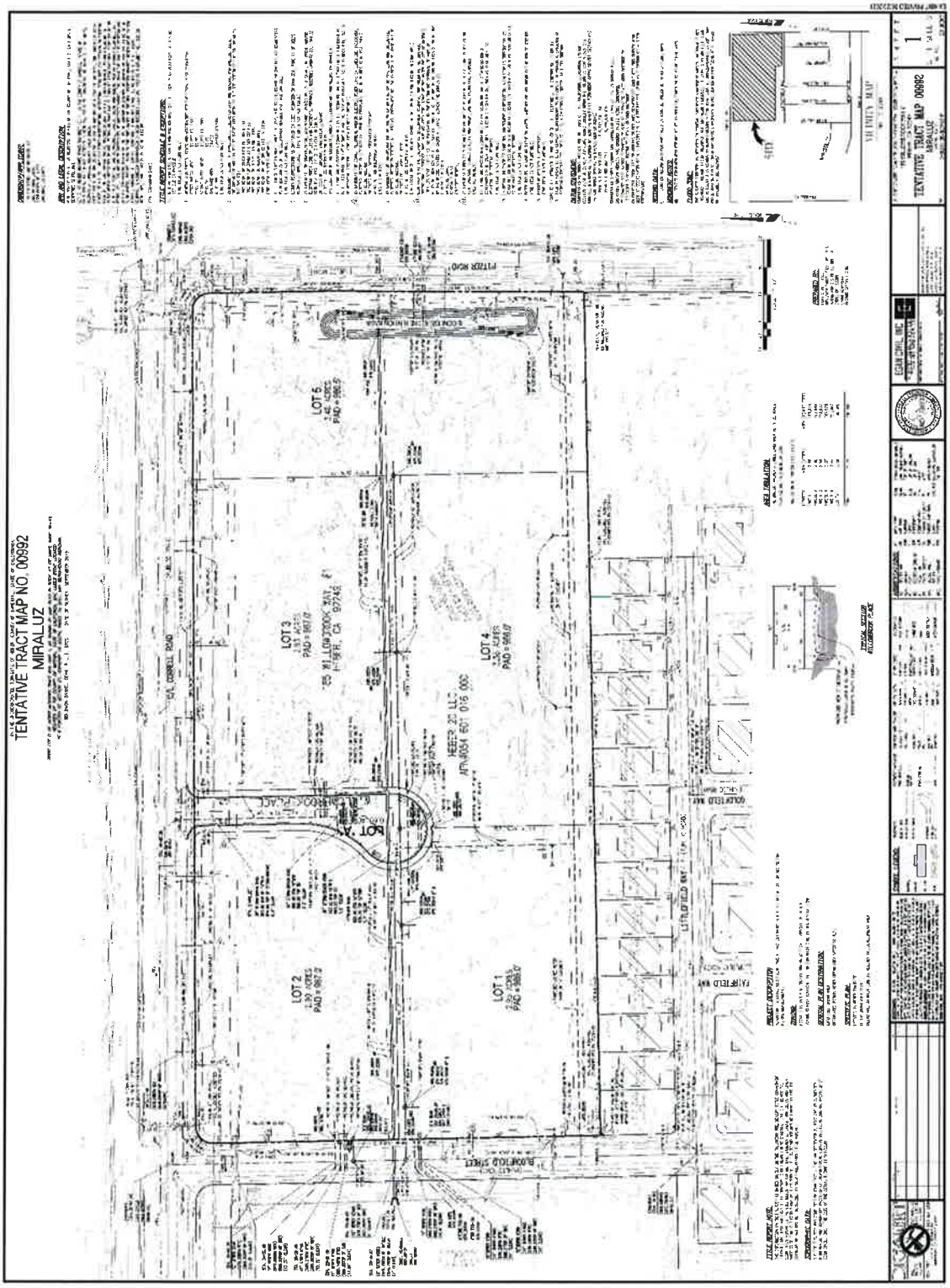
D. Analysis:
The project site is zoned R-3 (Medium-Heavy Density Residential) and part of the previously approved Tract 00956 Heber Meadows development project. The site would increase the density above what was approved for the overall Heber Meadows project and create five parcels; and thus, is being evaluated herein as a project specific action. The project would be constructed on a vacant parcel approved for the proposed use. The maximum density in R-3 zone is 29 dwelling units per net acre and the minimum lot area is 6000 square feet, it also shall provide a minimum of 2000 square feet/dwelling for multiple dwellings. The proposed project anticipates five parcels. The phase 1, lot 1 which is a 2.95 acre project would construct 64 apartments for low income families at a density of 21.7 du/acre, therefore it could be found to be consistent with minimum lot size and density for R-3 zone per Imperial County Land Use Ordinance Title 9, Division 5, Section 90504.04 Minimum Lot/Parcel Size & 90504.05 Minimum Lot Area. As presented in the

discussion of environmental checklist Sections I through XX herein, the project would have no impact, a less than significant impact, or a less than significant impact after mitigation with respect to all environmental issues.

E. General Plan Consistency: The project site is designated as High Density Residential within the Heber Urban Area Plan per the County of Imperial General Plan. Residential land uses area allowed at a maximum population density of twenty-nine dwelling unit per (net) acre (29 DU/AC) or meeting Title 25 requirements. Maximum height is forty (40) feet for residential units. The Miraluz project would be consistent with existing zoning and the General Plan designation. The SR-86/Pitzer Road improvements would occur within the ROW of established road corridors and it is expected to be consistent with the Imperial County General Plan's Circulation & Scenic Highways Element.

Exhibit "A"
Vicinity Map

Exhibit "B"
Site Plan/Tract Map



EVALUATION OF ENVIRONMENTAL IMPACTS:

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

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

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.
   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

I. *AESTHETICS*

Except as provided in Public Resources Code Section 21099, would the project:

a) Have a substantial adverse effect on a scenic vista or scenic highway? ☐ ☐ ☐ ☒

a) The project site is a vacant and disturbed parcel with limited ruderal vegetation. Agricultural land is located to the north and east. Single-family residential is located to the south and Heber Public Utility District lot is located to the west. Views to and from the site are consistent with the surrounding area and are not considered scenic or visually significant. According to the Imperial County General Plan[1], Circulation and Scenic Highway Element (2008), there are four potentially eligible highway segments for state scenic highway designation. These are segments of Interstate 8, State Route 78, Highway 111 and Borrego-Salton Seaway. All are located north and west of the site. None of the potentially eligible segments are designated scenic nor are they located in proximity to the project site. Development of the project site and improvements to the SR 86/Pitzer Road intersection would not affect a state vista or scenic highway. **No impact** would occur under this threshold.

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

b) As stated, the site is not located in proximity to a state designated scenic highway. As stated, the project site is a vacant and disturbed parcel with limited ruderal vegetation. There are no scenic resources (i.e., trees, rock outcroppings, historic buildings) on the site or within the SR-86/Pitzer Road right-of-way. Thus, none would be affected by the project. **No impact** would occur under this threshold.

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

c) The project site in the townsite of Heber, California, a community in unincorporated Imperial County. Urban development occurs to the south and west of the site. Cultivated agricultural land is located to the north and east. The project would be developed consistent with the approved Heber Meadows project, though at a higher density than what was initially anticipated for the site. Visually, the project would be consistent with the single-family residential area to the south. The project would change existing public views; however, landscaping and on-site improvements would enhance existing views from Pitzer Road to the east and East Correll Road to the north. The SR-86/Pitzer Road intersection improvements would widen the existing roadway and install a new signal for traffic control purposes. These improvements would not substantively change existing views. Impacts would be **less than significant**.

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

d) The proposed Miraluz project would add typical sources of residential lighting (i.e., interior lights and exterior security land landscape lighting). Headlights from traffic accessing the site would also contribute to existing light sources. All lighting shall be designed consistent with a lighting plan prepared per Imperial County Code Section 90804.04 (L). The SR-86/Pitzer Road improvements would provide safety lighting as required per Caltrans' design standards. The project would not add large areas of glass or other reflective material that would cause or contribute to glare. While the project would add lighting, it would be characteristic of the surrounding developed environment and not adversely affect day or nighttime views. A **less than significant** impact would occur under this

[1] Imperial County General Plan

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

threshold.

II. ***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 Department 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:

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

a) Per California Department of Conservation "Imperial County Important Farmland 2016 Map" the project site is classified as "Farmland of Local Importance", which identifies the site as an area of unirrigated and uncultivated lands with prime and statewide soils. However, the proposed project site is zoned High Density Residential per Heber Urban Area Map Figure 1 of the Heber Urban Area Plan[2], High Density Residential zones are intended to support medium-high density residential development. Therefore, impacts are considered **less than significant**.

b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract? ☐ ☐ ☐ ☒

b) The proposed project is listed as "Williamson Act-non-renewal", effective January 01, 2011 non-renewal was filed either by the landowner or the County for all Williamson Act contracts in Imperial. Therefore it is not expected to conflict with existing zoning for agricultural use, or a Williamson Act Contract. **No impact** is expected.

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))? ☐ ☐ ☐ ☒

c) The proposed project is consistent with the zoning, and it is not located within a forestland or timberland; therefore, it is not expected to conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)). **No impacts** are expected.

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

d) The proposed project is not located in a forest land, therefore, it is not expected to result in the loss of forest land or conversion of forest land to non-forest use. **No impacts** are expected.

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? ☐ ☐ ☐ ☒

e) As stated, the site is not used for agricultural purposes or timber production nor is it designated for these purposes. The project will not convert existing farmland to non-agricultural use nor will it convert forest land to non-forest use. **No impact** would occur under this threshold.

[2] Heber Urban Area Plan

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

III. *AIR QUALITY*

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to the following determinations. Would the Project:

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

a) According to the Air Quality/Greenhouse Gas Technical Report prepared by Birdseye Planning Group[3], Rules and regulations promulgated by the ICAPCD and in the State of California State Implementation Plan (SIP) revision applicable to the proposed project include the following:

- ICAPCD Rule 400, Nuisances, forbids the emission of air contaminants or other materials that would cause a nuisance to the public, including non-agricultural related odors.
- ICAPCD Rule 800 General Requirements for Control of Fine Particulate Matter (PM-10), requires actions to prevent, reduce, or mitigate PM-10 emissions from anthropogenic (man-made) Fugitive Dust (PM-10) sources generated within Imperial County.
- ICAPCD Regulation VIII, Rule 801 (Construction and Earthmoving Activities) establishes a 20 percent opacity limit, requires the implementation of a dust management control plan for all nonresidential projects of 5 acres or more, and requires compliance with other portions of Regulation VIII regarding bulk materials (Rule 802), carry-out and track-out (Rule 803), and paved and unpaved roads (Rule 805). The rule exempts single-family homes and waives the 20 percent opacity limit in winds over 25 miles per hour (mph) under certain conditions. To comply with this reguation, the applicant would implement Mitigation Measure AQ-1 which requires preparation of a Fugitive Dust Suppression Plan to minimize dust generated during construction and ground disturbing activities.
- ICAPCD Rule 804 Open Areas, requires actions to prevent, reduce or mitigate the amount of fine Particulate Matter (PM-10) emissions generated from Open Areas. Open areas are defined as any open area having 0.5 acres or more within urban areas, or 3.0 acres or more within rural areas; and contains at least 1,000 square feet of disturbed surface area.

Per Birdseye Planning Group, the SIP adopted by ICAPCD incorporates local city General Plans and the socioeconomic forecast projections related to regional population, housing and employment growth. The proposed project would develop up to 320 new multifamily residential units with implementation of all phases. This would increase the overall number of units approved as part of the Heber Meadows project; however, it is anticipated that future residents of the affordable housing project are living in Imperial County. The proposed project would not induce or result in population growth that would exceed forecasts for Imperial County. The project would not conflict with the County of Imperial General Plan or be inconsistent with the AQAP. Per APCD comment letter dated November 15, 2021 further describe on item b), below, taking into account the mitigation measures listed in Sections AQ-1 a and AQ-1 b of the Air Quality Report, it would be satisfactory for a project of this nature to maintain Tier 1 "less than significant". Therefore, **less than significant impacts** would occur under this threshold.

b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment	☐	☒	☐	☐

[3] Air Quality/Greenhouse Gas Technical Report prepared by Birdseye Planning Group

under an applicable federal or state ambient air quality standard?

b) According to the Air Pollution Control District comment letter dated November 15, 2021, Birdseye Planning Group's Air Quality Report values in tables 5-3 "Estimated Operational Emissions" and 5-4 "Estimated Maximum Daily Construction Emissions" were not corroborated in the CalEEMod report included in Appendix A. In particular, the Construction Particulate Matter values were much higher in the CalEEMod report. Certain inputs entered into the CalEEMod also undermine the validity of the analysis, for example, the "CalEEMod 1.3 User Entered Comments & Non-Default Data" indicates that the "Road Dust" was changed from the default value of 50% to 100%.

However, per APCD letter, the Handbook states "CEQA analyses for construction particulate matter impacts should be qualitative as opposed to quantitative." Taking into account the mitigation measures listed in Sections AQ-1 a and AQ-1 b of the Air Quality Report, the Air District found the mitigation measures consistent with those listed in the Handbook and sufficient for a project of this nature to maintain Tier 1 "less than significant" impact as defined in the Handbook, even without the support of the CalEEMod Report:

AQ-1a: Prior to commencing construction, the project applicant will be required to submit a Dust Control Plan to the ICAPCD for approval. The Dust Control Plan will identify all sources of PM_{10} emissions and associated mitigation measures during the construction and operational phases (see Rule 801 F.2). The applicant shall submit a "Construction Notification Form" to the ICAPCD 10 days prior to the commencement of any earthmoving activity. The Dust Control Plan submitted to the ICAPCD shall meet all applicable requirements for control of fugitive dust emissions, including the following measures designed to achieve the no greater than 20-percent opacity performance standard for dust control and address the following parameters:

- All disturbed areas, including bulk material storage that is not being actively used, shall be effectively stabilized; and visible emissions shall be limited to no greater than 20-percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material, such as vegetative groundcover. Bulk material is defined as earth, rock, silt, sediment, and other organic and/or inorganic material consisting of or containing particulate matter with 5 percent or greater silt content. For modeling purposes, it was assumed that watering would occur twice daily.

- All on-site unpaved roads segments or areas used for hauling materials shall be effectively stabilized. Visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by restricting vehicle access, paving, application of chemical stabilizers, dust suppressants and/or watering.

- The transport of bulk materials on public roads shall be completely covered, unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks shall be cleaned and/or washed at the delivery site after removal of bulk material, prior to using the trucks to haul material on public roadways.

- All track-out or carry-out on paved public roads, which includes bulk materials that adhere to the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto the pavement, shall be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area.

- Movement of bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers, or by

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

sheltering or enclosing the operation and transfer line except where such material or activity is exempted from stabilization by the rules of ICAPCD.

AQ-1b: Each project proponent shall implement all applicable standard measures for construction combustion equipment for the reduction of excess NO_X emissions as contained in the Imperial County CEQA Air Quality Handbook and associated regulations. These measures include:

- Use alternative-fueled or catalyst-equipped diesel construction equipment, including all off-road and portable diesel-powered equipment.
- Minimize idling time, either by shutting equipment off when not in use or reducing the time of idling to five minutes at a maximum.
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use. Replace fossil-fueled equipment with electrically driven equivalents (assuming powered by a portable generator set and are available, cost effective, and capable of performing the task in an effective, timely manner).
- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing construction activity during the peak hour of vehicular traffic on adjacent roadways.
- Implement activity management (e.g., rescheduling activities to avoid overlap of construction phases, which would reduce short-term impacts).

With implementation of AQ1a and AQ1b, impacts would be **less than significant**.

c)	Expose sensitive receptors to substantial pollutants concentrations?	☐	☐	☒	☐

c) The nearest sensitive receptor to the project site are residences located adjacent to and south of the site. As shown in Tables 5-3 and 5-4 of the Birdseye Planning Group's Air Quality Report, project construction and operation would not exceed ICAPCD pollutant thresholds. Pollutants generated during operation would be negligible. Therefore, impacts would be **less than significant.**

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

d) The proposed project would generate odors from construction (i.e., diesel exhaust); however, this would be temporary. Construction emissions would not exceed ICAPCD impact thresholds; thus, short-term odors are not expected to be significant. No odors would be associated with project operation. Odor impacts would be **less than significant.**

IV. *BIOLOGICAL RESOURCES Would the project:*

Impacts to biological resources were evaluated in the Natural Environment Study – Minimal Impact report prepared by ELMT Consulting, Inc., June 2021[4] and provided herein as Application Appendix B.

a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish	☐	☒	☐	☐

[4] Natural Environment Study – Minimal Impact report

and Wildlife or U.S. Fish and Wildlife Service?

The following material summarizes special status plants and animals located on or proximal to the biological study area (BSA) which is comprised of the Miraluz/Heber Meadows Affordable Housing project site and area of disturbance associated with the SR-86/Pitzer Road improvements as described herein.

a) The Biological Study Area (BSA) includes the limits of disturbance of the proposed project and a 250-foot buffer. The BSA was limited to the 250-foot buffer because no natural plant communities or special-status plant communities where identified within the proposed project area. Disturbance limits include the approximately 16-acre site for the Miraluz/Heber Meadows Affordable Housing Project and the grading limits within the State Route 86/Pitzer Road Improvements portion of the site within Caltrans right-of-way. The discussion herein is based on a literature review and a field visit conducted on March 24, 2021.

Per ELMT Consulting, Inc., no natural communities of special concern will be impacted from implementation of the proposed Project. The BSA does not provide suitable habitat for any of the special-status plant species known to occur in the area and are presumed to be absent from the BSA. However, one (1) special-status animal species was determined to have a high potential to occur within the BSA: burrowing owl. The survey performed on March 24, 2021, detected one (1) burrowing owl northeast on the northern portion of the BSA, outside of the proposed project footprint. All other special-status animal species are not expected to occur and are presumed absent from the BSA based on specific habitat requirements for special-status animal species, availability and quality of habitat within the BSA, and known distributions. No direct or indirect impacts to special status animal species are anticipated from implementation of the Project.

It was determined by the Natural Environment Study that the project has the potential to have indirect impacts to burrowing owl species during the avian breeding season February 1st to August 31st) season when individuals may be attempting to incubate eggs or raise young. With implementation of Mitigation Measure BIO-1, potential impacts to burrowing would be reduced to **less than significant**.

> **MM- BIO-1:** Within three (3) days prior to ground disturbance, the construction area and adjacent areas within 500 feet of the Project footprint, will be surveyed by an Acceptable Biologist for burrows that could be used by burrowing owl. If a suitable burrowing owl burrow is observed, the biologist will determine if the burrow has recently been used or if an owl is present in the burrow. If the burrow is determined to be occupied, the burrow will be flagged and a 200-foot buffer during the non-breeding season and a 500-foot buffer during the breeding season or a buffer to the edge of the property boundary if less than 500 feet, will be established around the burrow. The buffer will be staked and flagged. No construction activities will be permitted within the buffer until the young are no longer dependent on the burrow. In coordination with CDFW, the no work buffer can be reduced depending on the behavior of the burrowing owls, topography, existing vegetation, human development, and land uses in an area.
>
> It is recommended that a biological monitor be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest becomes inactive under natural conditions, construction activities may resume within the buffer area.
>
> If the burrow is unoccupied, the burrow will be made inaccessible to owls, and construction activities may proceed. If either a nesting or escape burrow is occupied, owls shall be relocated pursuant to accepted Wildlife Agency protocols. A burrow is assumed occupied if records indicate that, based on surveys conducted following protocol, at least one burrowing owl has been observed occupying a burrow on site during the past three years. If there are no records

for the site, surveys must be conducted to determine, prior to construction, if burrowing owls are present. Determination of the appropriate method of relocation, such as eviction/passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

In addition to a pre-construction clearance survey, a Worker Environmental Awareness Program (WEAP) shall be conducted prior to the start of construction, focusing on the avoidance and minimization of impacts to burrowing owl during construction.

TR#00956 Environmental Evaluation Committee Specific Mitigation Measures

The project is also subject to the existing Mitigation Measures as required for the Heber Meadows Tract #00956:

MM-TR00956-20:Burrowing Owl Survey (California Dept. of Fish and Game). The Developer shall do a pre-construction survey for burrowing owls within one month of the commencement of earth disturbance (grading or construction) on the project site; if the pre-construction survey determines that no burrowing owls are on the project site, all on-site burrows shall be caved prior to the commencement of earth disturbance; and if the survey determines that burrowing owls are on-site, adult owls shall be captured and relocated to an off-site reserve and other measures to mitigate potential impacts to the burrowing owl are available and can be negotiated with the California Department of Fish and Game as appropriate.

With incorporation Mitigation Measures BIO-1 and TR00956-20 impacts are expected to lessen to less than significant levels.

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?	☐	☐	☐	☒

b) The proposed project's Natural Environment Study performed a records search within the Heber USGS 7.5-minute quadrangle, results from the research concluded that no natural community of special concerns were identified by the CNDDB. Additionally, no natural communities of special concern were observed with the BSA. As a result, **no impact** to natural communities of special concern from implementation of the Project would occur.

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

c) According to the proposed project Natural Environment Study, no jurisdictional drainage and/or wetland features were observed on the project site during the field investigation, neither no blueline streams, have been recorded on the project site. Additionally, no resources occur within or adjacent to the site according to the USFW's National Inventory review. Therefore, development of the project will not result in impacts to wetland or other jurisdictional features.

Within the biological study area several agricultural concrete-lined v-ditches were observed, however their intend is for agricultural uses and do not fall under the regulatory authority of the Corps, Regional Board or CDFW. **No impacts** would occur these wetland resources.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
d) Interfere substantially with the movement of any 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?	☐	☐	☒	☐

d) Per NES, the closest wildlife corridor is the New River, which is located approximately 5 miles west of the project site, since the site is isolated from the New River wash area by existing agricultural uses and development, it is not expected that the proposed project would result in substantial interference with the movement of any 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. Any impact is expected to be **less than significant**.

e) Conflict with any local policies or ordinance protecting biological resource, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

e) No local policies protecting biological, such as a tree preservation policy or ordinance applies to the project site and related improvements associated with the proposed project. **No impact** would occur under this threshold.

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?	☐	☐	☐	☒

f) No adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional or state habitat conservation plan applies to the project area and proposed scope of improvements. The Imperial Irrigation District is currently in the process of preparing a Natural Community Conservation Plan (NCCP) and Habitat Conservation Plan (HCP) in consultation with the CDFW and the USFWS; however, this plan has not been adopted. **No impact** would occur under this threshold.

V. *CULTURAL RESOURCES Would the project:*

Potential impacts to historic and cultural resources associated with development of the proposed Miraluz/Heber Meadows Apartment Project and SR-86/Pitzer Road improvements, were evaluated in two separate technical reports; Cultural Resources Study for the Heber Meadows Subdivision Project, Community of Heber, Imperial County, California, prepared by Anza Resource Consultants, Inc., March 2021[5] and the State Route 86 at Pitzer Road Intersection Improvement Project, prepared by Anza Resource Consultants, Inc., June 2021[6] provided herein as Application Appendices C and D, respectively.

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

a) Per Anza Resource Consultants Inc., cultural records and pedestrian survey revealed no archaeological, tribal cultural, or historic built environment resources within or adjacent to the proposed project Area of Potential Effect (APE) and area of disturbance for the SR-86/Pitzer Road improvements.

However, the Sacred Lands File search results indicated that resources important to Native Americans are present in the vicinity of the APE; two emails were received from Tribes requesting monitoring which is further explained below under item b).

[5] Cultural Resources Study for the Heber Meadows Subdivision Project
[6] Cultural Resource Study for State Route 86 at Pitzer Road Intersection Improvement Project

The pedestrian survey performed for the SR-86/Pitzer Road improvements on March 10, 2021, identified one California Register of Historic Resources (CRHR)-eligible historic built environment resource within the project site: the Daffodil Canal. The Daffodil Canal appears CRHR eligible under Criterion 1 as a contributor to a CRHR-eligible district, the All-American Canal system.

The construction would encroach into the Daffodil Canal by requiring the northward extension of the piped segment under SR-86 as much as 50 feet. The gate may or may not also require relocation. Per Anza Resource Consultants Inc., the proposed impact is not expected to cause an adverse change to the significance of the resource and no further cultural resources work is recommended. As such, project related impacts to this resource would be less than significant.

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

b) As part of the Cultural Resource Report research process, a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) was requested on February 23, 2021. The NAHC sent a response on March 9, 2021, stating that a search of the SLF was completed with positive results (i.e., sacred lands or resources important to Native Americans are recorded within the vicinity of the project APE). The letter recommended that the Torres-Martinez Desert Cahuilla Indians and the Ewiiaapaayp Band of Kumeyaay Indians be contacted for more information.

On March 9, 2021, Anza mailed letters to the NAHC-listed contacts describing the project and asking if they had knowledge regarding cultural resources of Native American origin within or near the APE. Anzo also emailed a letter to Cultural Resources Director Michael Mirelez of the Torres-Martinez Desert Cahuilla Indians and Chairperson Robert Pinto of the Ewiiaapaayp Band of Kumeyaay Indians on March 9, 2021, to encourage dialogue.

On March 17, 2021, Quechan Indian Tribe Historic Preservation Officer H. Jill McCormick responded Anza via email stating that the tribe had no comments regarding the project.

On March 17, 2021, Anza sent emails to remaining contacts with copies of the letters attached and providing an additional opportunity to comment or ask questions regarding the proposed undertaking.

On October 19, 2021 during the initial Agencies commenting period for the proposed project two emails from Native American tribe were received. On email dated October 28, 2021 the Viejas Band of Kumeyaay Indians ("Viejas") reviewed the project and determined that the project site has cultural significance of ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project. Viejas Band requested that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new development such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

On email received on October 30, 2021, La Posta Band of Mission Indians stated that for any ground disturbance they will to see a native monitor on site for any artifacts that may be there.

Based on emails received from La Posta Band of Mission Indians and Viejas Band of Kumeyaay Indians ("Viejas") impacts could be significant, unless Mitigation Measure (MM-CR-1) is incorporated:

MM-CR-1: A Kumeyaay Cultural Monitor shall be on site for ground disturbing activities and to inform the Tribes of any new development such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

Additionally, Anza Resource Consultants Inc. Cultural Resource Reports also recommends Standard Condition (CR-1) to avoid potential impacts from the unanticipated discovery of cultural resources during project related ground disturbing activities:

> **Standard Condition CR-1.** If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards for archaeology (National Park Service 1997), as appropriate must be contacted immediately to evaluate the find in accordance with CEQA. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation may be warranted.

It is expected that implementation of Mitigation Measure (MM-CR-1) and Standard Condition CR-1 would bring impacts to less than significant levels.

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

c) Per Anza Resource Consultants Inc. Cultural Resource Reports potential for encountering human remains at the project site is low. No known burial sites have been identified on the site or in the vicinity. Should human remains be encountered during project construction, implementation of Standard Condition CR-2 can be implemented as needed to avoid impacts to human remains should they be discovered during construction.

> **Standard Condition CR-2**: If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a Most Likely Descendant. The Most Likely Descendant shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

With implementation of Standard Conditions CR-1 and CR-2 and Mitigation Measure MM-CR-1, impacts to cultural resources would be **less than significant**.

VI. *ENERGY Would the project:*

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

a) Project construction would utilize common methods for site preparation, grading and installation of all infrastructure. Techniques are not expected to be wasteful or otherwise result in inefficient use of fuels or other sources of energy. The proposed project would be required to comply with California Energy Code Title 24 requirements in effect at the time buildings are being designed. A **less than significant** impact would under this threshold.

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

b) The project would create five parcels for the further construction of 320 multi-family residences and related improvements. The proposed project would be required to comply with California Energy Code Title 24 requirements. State and local plans regarding renewable energy or energy efficiency

are summarized in the Air Quality and Greenhouse Gas Study (Birdseye Planning Group, April 2021 – See Appendix A). The project would comply with applicable elements of state and plans through the implementation of measures addressing energy efficient design, water conservation and related features that reduce overall energy demand.

When in operation, the project would generate demand for 4,734,110 kBTU of natural gas annually and 1,555,280 kWh of electricity annually (CalEEMod 2016.3.2) (*See,* Appendix A, Air Quality and Greenhouse Technical Report (Birdseye Planning Group, May 2021). While this would increase demand for public utilities in the region; for reasons stated above, this would not represent a significant impact with respect to energy consumption nor would it conflict with state or local plans for renewable energy or energy efficiency. **Less than significant impacts** would under this threshold.

VII. ***GEOLOGY AND SOILS Would the project:***

Information in this section is summarized in part from the *Geotechnical Report for the Proposed Heber Meadows Apartments*, Landmark Consultants, Inc., December 2020[7], and provided in Appendix E.

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

a) The proposed project is not expected to directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death. Impacts are considered **less than significant**.

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

1) The proposed project site is located within the seismically active Imperial Valley with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. There are no know faults underlying the project site, the nearest zoned fault is the Imperial fault located 5.2 miles East approximately from the project site. The site is not located within an Alquist-Priolo Earthquake Fault Zone. As stated in the Geotechnical Report, the likelihood of a surface fault rupture is low.

2)	Strong Seismic ground shaking?	☐	☐	☒	☐

2) There is a potential for strong groundshaking during earthquakes along the Imperial, Brawley, and Superstition Hills faults. Section 4 of the Geotechnical Report provides design criteria for site preparation and foundation design to minimize impacts associated with a seismic event in compliance with the latest edition of the CBC for Site Class D using the seismic coefficients. With implementation of these recommendations, impacts related to seismic ground shaking would be **less than significant.**

3)	Seismic-related ground failure, including liquefaction and seiche/tsunami?	☐	☐	☒	☐

3) The project site is not located over a known fault; thus, the potential for a surface fault rupture or ground failure is remote. Liquefaction is a potential design consideration because of underlying saturated sandy substrata.

The following design options would reduce the potential effects of liquefaction-induced settlements by making the structures more able to withstand differential settlement:

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	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

1) Construction of foundations that use grade-beam footings to tie floor slabs and isolated columns to continuous footings (conventional or post-tensioned).

2) Use of structural flat-plate mats, either conventionally reinforced or tied with posttensioned tendons.

Tsunamis and seiches.
The project site is not located within a large body of water, a seiche could occur, however, in the Salton Sea under the appropriate seismic conditions. The Salton Sea is approximately 27 miles north of the site. It is proximal to the San Andreas and San Jacinto faults; and thus, would be subject to significant seismic ground shaking that could generate a seiche, however a seiche event at the project site is remote. Impacts associated with seismic-related ground failure, liquefaction and seiche/tsunami would be **less than significant.**

4)	Landslides?	☐	☐	☐	☒

4) The project site is flat and not located within an area susceptible to landslides referenced in Imperial County General Plan Seismic/Public Safety Element[8] (Figure 2). No landslide potential occurs on the project site. **No impact** would occur under this threshold.

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

b) According to the Imperial County General Plan Seismic/Public Safety Element, the areas in Imperial County that are most subject to erosion are the Algodones Sand Dunes paralleling the East Mesa and Superstition Mountain, and the Chocolate, Picacho, Cargo Muchacho, and Coast Range Mountains. The remainder of Imperial County is generally flat and experiences low natural erosion. As noted, the site is generally flat and has historically been used for agricultural purposes. Earthwork would be required to create the building pads, street infrastructure and related improvements. With implementation of Best Management Practices (BMPs) specified in the Stormwater Pollution Prevention Plan (SWPPP) prepared for the project, soil erosion hazard impacts would be **less than significant.**

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

c) The project site is flat and surrounding by flat properties. The project would not introduce features or require modification of site conditions that would create the potential for landslides. The threat of landslides would occur as a result of project construction. As stated previously, per Landmark Geotechnical Report, the soils occurring on-site include saturated silts and silty sands that could liquefy during a strong earthquake, however there is an estimate of less than 1 inch of liquefaction induced settlements, and therefore no ground improvement or deep foundation mitigation is required at this project site. With the implementation of foundation design features summarized above under item 3), potential impacts related to lateral spreading, subsidence, liquefaction or collapse would be **less than significant.**

d)	Be located on expansive soil, as defined in the latest Uniform Building Code, creating substantial direct or indirect risk to life or property?	☐	☐	☒	☐

d) Native surface on site is classified as clay which is expected to have a moderate expansion

[8] Imperial County General Plan Seismic/Public Safety Element

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

potential. Per Geotechnical report, clay is expansive when wet and can shrink when dry. Therefore, Mitigation for potential swelling forces and reduction in soil strength shall be included in the development of building foundations and concrete flatwork.

Design features recommended in the Geotechnical Report used for similar projects to remediate expansive soil include:

- Replacement of expansive clays (3.0 feet) with non-expansive sands or silts;
- Moisture conditioning subgrade soils to a minimum of 5% above optimum moisture (ASTM D1557) within the drying zone of surface soil;
- Capping clay soil with a non-expansive sand layer of sufficient thickness (3.0 feet minimum) to reduce the effects of soil shrink/swell.
- Design of foundations that are resistant to shrink/swell forces of clay soil.
- A combination of the methods described above

With implementation of design features recommended in the Geotechnical Report, impacts related to expansive soils would be **less than significant**.

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?	☐	☐	☐	☒

e) The residential element of the project would connect to the existing Heber Public Utilities District sewer system. It would not require the use of a septic system. **No impact** would occur under this threshold.

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

f) The Conservation and Open Space Element of the General Plan[9] contains requirements for cultural resources that involve the identification and documentation of significant historic and prehistoric resources and the preservation of representative and worthy examples. The Conservation and Open Space Element also recognizes the value of historic and prehistoric resources and the need to assess current and proposed land uses for impacts upon these resources. No evidence of paleontological resources occurs on-site. Mitigation provided for Cultural Resources, would address the potential discovery of unknown paleontological resources that may be exposed during site excavation. No impact is anticipated; however, a less than significant impact would occur if resources were discovered and mitigation implemented as warranted.

VIII. *GREENHOUSE GAS EMISSION Would the project:*

a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

The material presented herein is based on the *Air Quality and Greenhouse Gas Technical Report* prepared by Birdseye Planning Group, May 2021, provided herein as Appendix A.

a) Construction activities would generate greenhouse gas (GHG) emissions associated with equipment operation. The project-related construction emissions would be generated over an anticipated two-year construction phase extending from 2022 through 2023. Site preparation and

[9] Conservation and Open Space Element of the Imperial County General Plan

grading typically generate the greatest emission quantities because the use of heavy equipment is greatest during this phase of construction. Emissions associated with the construction period were estimated based on the projected maximum amount of equipment that would be used onsite at one time. Air districts such as the SCAQMD have recommended amortizing construction-related emissions over a 30-year period to calculate annual emissions. Construction of the project would generate approximately 1,371 metric tons of construction related GHG emissions (Appendix A, Air Quality and Greenhouse Gas Study (Birdseye Planning Group, April 2021). Amortized over 30 years, the project would generate 42 metric tons as shown in Table 5 below. Table 5 also shows the new construction, operational, and mobile GHG emissions (including 180 MTE of transportation related NOx emissions) associated with the proposed project. Long-term operational emissions relate to energy use, solid waste, water use, and transportation. Each source is shown below. The majority (60%) of the project's GHG emissions are associated with motor vehicular travel (represented in Table 5 as mobile sources).

Table 5
Combined Annual Unmitigated Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Construction	42 metric tons
Operational	
Energy	1,191 metric tons
Solid Waste	74 metric tons
Water	270 metric tons
Mobile	2,335 metric tons
Total	**3,916 metric tons**

See Appendix A for CalEEMod software program output

Table 6 shows mitigated GHG emissions derived from applying reduction percentages associated with various statewide initiatives intended to reduce overall GHG emissions. With the exception of water and solid waste reduction factors, these are factors in addition to those available as mitigation measures in CalEEMod 2016.3.2. As shown, with application of various factors intended to reduce GHG emissions the project would exceed the 21.7 percent reduction from BAU. Additionally, as previously stated under Section III "Air Quality (b)" with implementation of Mitigation Measures AQ1a and AQ1b, the project would fall under "Tier 1", impacts would be **less than significant**

Table 6
Combined Annual Greenhouse Gas Mitigated Emissions

Emission Source	Annual Emissions (CO_2E)	2023 With Design Features	Percent Reduction
Construction	46 metric tons	46	0.0%
Operational			
Energy	1,191 metric tons	202	83%
Solid Waste	74 metric tons	18	75%
Water	270 metric tons	193	20%
Mobile	2,335 metric tons	1,915	18%
Total	**3,916 metric tons**	**2,374 metric tons**	**-39%**

See Appendix for CalEEMod software program output.

		Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
b)	Conflict with an applicable plan or policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

According to the proposed project's Air Quality-Greenhouse Gas Report, the project is not expected to generate enough GHG emissions to cumulatively contribute to global climate change; and thus, would not adversely impact the attainment of statewide reductions in GHG emissions. The project is expected to be consistent with EO S-3-05, AB 32 and the GHG reduction goals established by SB 32. Impacts would be **less than significant**.

IX. *HAZARDS AND HAZARDOUS MATERIALS* *Would the project:*

Information provided in this section is based in part on the *Phase I Environmental Site Assessment for Heber Meadows* prepared by Advantage Environmental Consultants[10], July 2020 (Appendix F).

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

a) Per Caltrans comment letter dated December 14, 2021, a hazardous waste concern for this project is aerially deposited lead (ADL). Elevated levels of ADL are common in the soil adjacent to State highways and can also be found underneath some existing road surfaces due to past construction activities. ADL is usually found within 30 feet of the edge of the pavement and within the top six inches of the soil. In some cases, the lead is as deep as two to three feet below the surface. The Department of Toxic Substances Control (DTSC) sets regulatory thresholds for lead in soil, based on risk assessment work performed by CalEPA's Office of Environmental Health Hazard Assessment (OEHHA). It is the Permittee's responsibility to comply with the DTSC ADL requirements for roadway soil management.
Compliance with Caltrans requirements would bring impacts to **less than significant levels**.

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

b) The proposed project would be a new 320-unit multifamily residential development. No hazardous materials other than small quantities of cleansers, automobile fluids, and swimming pool chemicals typical of residential development would be used or stored on-site. Thus, applicant shall comply with the DTSC ADL requirements for roadway soil management per item a) above. It is expected that such compliance would bring impacts to **less than significant levels**.

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

c) Heber Dogwood Elementary School is located approximately half mile northwest of the site and is the closest school. The project is a residential development with associated roadway improvements. The project is not expected to emit emissions or handle hazardous materials or substances. Common cleaning chemicals would likely be stored in each unit. These would not be used or stored in quantities that would cause or contribute to an impact related to hazardous materials. **No impact** would occur under this threshold.

[10] Phase I Environmental Site Assessment

		Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
d)	Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐

d) The Phase I prepared for the project site states that the project site is not on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The site has been historically utilized for agricultural purposes.

Based on the regulatory and historical research completed during the preparation of the Phase I, no information was revealed that would indicate that an accidental spill or release of pesticide products has occurred at the site. Further, neither stressed vegetation nor evidence of the past storage of pesticides was observed on the property. Thus, the former agricultural use of the site is not considered a Recognized Environmental Condition (REC). However, soil sampling and analysis was conducted to obtain more detailed information regarding materials in the soil.

Soil sampling and analysis was conducted on June 4, 2020, to assess potential impacts from prior agricultural activity at the site. In addition, soil samples were obtained from various soil piles present at the property. A total of ten soil samples were collected using a stainless-steel hand auger. Five in-situ soil samples were collected from the surface to one-foot depths at five locations to identify the presence of residual agricultural chemicals. One soil sample was obtained from the relatively large soil pile present in the southern portion of the site. In addition, four soil samples were obtained from smaller soil piles located throughout the eastern portion of the site. All ten of the soil samples were analyzed for total arsenic by United States EPA Test Method 6010B and organochlorine pesticides (OCPs) by United States EPA Test Method 8081A.

Arsenic was detected at or above the laboratory reporting limit in each of the ten samples obtained during the sampling effort. The arsenic detections ranged from 3.61 milligrams per kilogram (mg/kg) to 5.91 mg/kg. These concentrations are within the range of what is considered naturally occurring. None of the detected arsenic concentrations exceeded its generic screening level of 12 mg/kg. None of the detected OCP concentrations exceed their respective California Department of Toxic Substances Control Screening Levels (DTSC-SLs) for residential soil. Impacts are expected to be **less than significant** under this threshold.

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

e) The airport nearest the project site is Calexico International Airport. The airport is located approximately 4.7 miles south of the project site. The project site is located outside the airport compatibility area as defined in the Imperial County Airport Land Use Compatibility Plan[11] (ALUC) (June 1996). **No impact** would occur under this threshold.

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

f) The County of Imperial General Plan Seismic and Public Safety Element does not identify SR-86 or Pitzer Road as an evacuation route. Regardless, intersection improvements would improve overall circulation within area. The northern leg of the SR-86/Pitzer Road intersection would be opened, the east/west approaches would be widened and a signal would be installed for traffic control purposes. This would better facilitate emergency access to the site and surrounding

[11] Imperial County Airport Land Use Compatibility Plan

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

properties as well as improve vehicle movement within the area under typical as well as emergency conditions. Thus, the project would not interfere with an adopted emergency response plan or emergency evacuation plan. **No impact** would occur under this threshold.

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

g) The site is not located in a Fire Hazard Severity Zone as defined by the California Department of Forestry[12] https://egis.fire.ca.gov/FHSZ/. Materials used in the construction of the buildings would be consistent with the Uniform Fire Code (Imperial County Code Chapter 8.20) and are intended to minimize or avoid fire-related impacts. The project site and surrounding land are developed, disturbed vacant land or cultivated agricultural land. The SR-86 ROW is disturbed and maintained for weed abatement purposes. Thus, the potential for wildfire in the project area is low. A **less than significant** would occur under this threshold.

X. *HYDROLOGY AND WATER QUALITY Would the project:*

Information in this section is summarized from the *Preliminary Hydrology Study for Tract 00992 Miraluz, Heber, CA*, prepared by Egan Civil Engineering, Inc., March 2021[13], and provided herein as Appendix G.

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

a) The project site is vacant and part of the larger Heber Meadows project (Tract Map 00956). On-site drainage would be modified as a result of project construction as referenced in the Hydrology Study (March 2021). The project site, existing Heber Meadows development and Pitzer Road all drain into one of two existing basins. The existing West Retention Basin (Retention Basin #1) is approximately 6.9 acres in size and located at the southwest corner of Bloomfield Street and East Correll Road west of the project site. The basin was designed to accommodate storm flows for the Heber Meadows project area which is reported to be an area of 86.17 acres. The basin is reported to provide a total capacity of 20.9-acre feet. The required storage volume was adjusted during preparation of the current hydrology report to 20.6-acre feet. This calculation does not include flows from the Pitzer Road area that is currently stored in a basin located on the east side of the site. The adjusted existing retention basin volume is adequate to retain the calculated runoff from all existing development, the proposed project and tributary areas.

The existing East Retention Basin (Retention Basin #2) is not referenced in the original Heber Meadows Hydrology Study; however, improvement plans depict storm drain infrastructure in Pitzer Road being routed to this basin. The storage capacity of Basin #2 is approximately 0.36-acre feet which is less than the 0.76 acres feet of runoff calculated for the Pitzer Road area. Thus, the proposed project would expand Basin #2 to accommodate runoff from Pitzer Road as well as from proposed improvements at the Pitzer Road and SR-86 intersection.

Proposed drainage patterns mimic the existing drainage pattern by directing storm water runoff from the site to the Retention Basin #1 and drainage from the Pitzer Road area and SR-86 to Retention Basin #2. The surface would be allowed to percolate into the subsurface soils. The project would not substantially degrade water quality or otherwise violate discharge standards. Impacts would be **less than significant**.

b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project	☐	☐	☒	☐

[12] California Department of Forestry
[13] Preliminary Hydrology Study for Tract 00992 Miraluz

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

may impede sustainable groundwater management of the basin?

b) The site is currently pervious; and thus, some groundwater recharge may occur during precipitation events. Post-construction, the majority of the site would be impervious. All stormwater would be retained in one of two basins allowed to percolate into the soil. The project would change how the groundwater is recharged on-site; however, overall recharge volumes would not change. Thus, the project is not expected to directly interfere with groundwater recharge or contribute to depletion of the basin. A **less than significant impact** would occur.

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

c) The proposed project is not expected to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, impacts are expected to be **less than significant**.

(i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐

While the project would modify on-site drainage, it would not alter the course of an existing stream or river that would result in on- or off-site erosion or siltation. The project would require preparation of a Water Quality Management Plan (WQMP) which will provide Best Management Practices (BMPs) to address off-site erosion of disturbed soils during construction. As stated, all storm flows would be conveyed into one of two existing basins for retention and percolation into groundwater. Basin #1 is adequately sized to retain storm flows from the project site. Basin #2 would be upsized. Use of the stormwater treatment system would retain the design capture volume for the project and convey flows into a subsurface system where water would percolate into the soils. With implementation of the stormwater system as designed, no off-site erosion or siltation would occur. Impacts would be **less than significant.**

(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐

The project would be designed to mimic existing drainage patterns; however, drainage would be modified to capture, retain and treat on-site flows. There would be a total of five drainage areas on the site. The existing Heber Meadows development is referred to as Drainage Area A and is comprised of 56.14 acres; Drainage Area B is the proposed project site is comprised of 18.77 acres and Drainage Area C is the basin area and is 6.9 acres in size. The total runoff volume from the three areas is 20.46-acre feet. These areas would drain to Basin #1. The total basin capacity is 20.9- acre feet.

Drainage Area D is the Pitzer Road area and is comprised of 2.56 acres. Drainage Area E is comprised of the existing retention basin (Basin #2) and is 0.48 acres. Combined, the area is 3.05 acres in size and has a drainage volume of 0.76-acre feet. The Basin #2 capacity is 0.36 acres. Basin #2 would be expanded to accommodate the addition of 0.40-acre feet from Drainage Areas D and E.

The project would increase the rate of on-site runoff as the majority of the site would be impervious after construction. As stated, Basin #1 has sufficient capacity to accommodate flows from Drainage Areas A, B and C. Basin #2 would be expanded to retain volumes from Drainage Areas D and E. While the project would redirect on-site drainage patterns, it would not impede or redirect flood flows on- or off-site. A **less than significant** impact would occur.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or;	☐	☐	☒	☐

As stated, the Basin #2 has adequate capacity to accommodate flows from Drainage Areas A, B and C. Basin #2 would be upsized to accommodate flows from Areas D and E. The project would not generate substantial additional sources of polluted runoff. The project would not exceed the capacity of the existing (Basin #1) and upsized (Basin #2) stormwater retention systems. Impacts would be **less than significant** under this threshold.

(iv) impede or redirect flood flows?	☐	☐	☐	☒

The project site is not located within a 100-year mapped flood zone (FEMA Flood Insurance Rate Map No. 06025C2075C, September 26, 2008). Thus, flood flows would not be redirected with development of the proposed project. **No impact** would occur.

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

d) The project is located well inland from the Pacific Ocean; thus, there is no risk of tsunami. The project site is not within a flood zone. The project would provide 320 units of multifamily residential development and improve the SR-86/Pitzer Road intersection. While remote, if inundation were to occur, it is not expected to result in the release of pollutants. **No impact** would occur under this threshold.

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

e) The proposed project is not expected to cause or contribute to the release of polluted stormwater runoff or generate other discharges that could adversely impact water quality within the Colorado River Basin. All runoff would be retained on-site and treated prior to percolation into the soil. The proposed project is not expected to conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Any impact is expected to be **less than significant.**

XI. *LAND USE AND PLANNING Would the project:*

a)	Physically divide an established community?	☐	☐	☐	☒

a) The project site is zoned R-3 and part of the previously approved Heber Meadows development project. The site would increase the density above what was approved for the overall Heber Meadows project; and thus, is being evaluated herein as a project specific action. The project would be constructed on a vacant parcel approved for the proposed use. The SR-86/Pitzer Road improvements are not expected to divide an established community. **No impact** would occur under this threshold.

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

b) The project site is zoned R-3 and designated as High Density Residential designation within the Heber Urban Area Plan per the County of Imperial General Plan. The Miraluz/Heber Meadows Affordable Housing project would be consistent with existing zoning and the General Plan designation. The SR-86/Pitzer Road improvements are expected to occur within the ROW of

established road corridors, therefore, the proposed project is not expected to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Impacts are considered **less than significant**.

XII. ***MINERAL RESOURCES*** ***Would the project:***

		Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

a) As shown in The Imperial County General Plan, Open Space and Conservation Element, Figure 8, Imperial County Existing Mineral Resources, the Heber area is not designated a mineral resources zone nor are mineral resources known to occur in the area. Construction of the proposed project would not cause or contribute to the loss of mineral resources that would be of value to the region and residents of the state. **No impact** would occur under this threshold.

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

b) Per the Imperial County Open Space and Conservation Element, the Heber area is not designated as a locally-important mineral resources zone nor are mineral resources known to occur in the area. **No impact** would occur under this threshold.

XIII. ***NOISE*** ***Would the project result in:***

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

a) This section evaluates per Noise Report prepared by Birdseye Planning Group[14], May 2021 (Appendix H) the potential for temporary impacts associated with construction activity, long-term impacts associated with traffic noise generated on neighboring roadways and operational noise associated with the proposed project.

Future Noise Environment, Impacts, and Considered Abatement
Per Noise Report, even though all developed land uses were assessed in the analysis, noise abatement was only considered for areas of frequent human use which would be the rear yards of residential buildings construction constructed on south of the project site on the west side of Pitzer Road.

The results of the modeled noise levels did not exceed Imperial County compatibility guidelines as long term traffic noise volumes would be within the compatibility range allowed per the Imperial County General Plan Noise Element. Thus, there are no significant noise impacts predicted at sensitive receptor land uses within the project area, and therefore, no noise abatement is proposed.

Construction Noise
The proposed project shall comply with Imperial County General Plan Construction Noise Standards, which states that construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dB Leq, when averaged over an eight (8) hour period, and measured at the nearest sensitive receptor. This standard assumes a construction period, relative to an individual sensitive receptor of days or weeks. In cases of extended length construction times, the standard may be tightened so as not to exceed 75 dB Leq when averaged over a one (1) hour

[14] Noise Report prepared by Birdseye Planning Group

period. Construction equipment operation shall be limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays.

SR-86/Pitzer Road intersection

Noise Report mentions that Caltrans Standard Specifications Section 14-8.02 (2010) states that noise levels generated during construction shall not exceed 86 dBA LMax at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m. and it also states that all internal combustion engines on the job site must be equipped with the manufacturer recommended muffler.

Per Noise Report, construction equipment on roadway and bridge construction projects is expected to generate noise levels ranging from 82 to 93 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. However, no adverse noise impacts associated with construction of the SR-86/Pitzer Road intersection are anticipated because construction shall be conducted in accordance with Caltrans Standard Specifications Section 14-8.02 and applicable Imperial County noise standards. The following measures would minimize temporary noise from construction:

MM-N-1. All equipment will have sound-control devices that are no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust.

MM-N-2. As directed by Caltrans, the contractor will implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

Heber Meadows Affordable Housing project

Per Noise Report, construction noise would likely be audible at receivers located in proximity to the site. However, the proposed project shall comply with limitations on hours of construction activity mentioned above. It is possible that noise levels would exceed 75 dBA at the southern property line; however construction equipment are transient rather than stationary sources. Thus, noise levels are not likely to exceed a 75 dBA average over an 8-hour workday.

Temporary construction noise could be reduced through implementation of the following measures:

> **MM-N-3: Construction Equipment**. Electrical power shall be used to run air compressors and similar power tools. Internal combustion engines should be equipped with a muffler of a type recommended by the manufacturer and in good repair. All diesel equipment should be operated with closed engine doors and should be equipped with factory-recommended mufflers. Construction equipment that continues to generate substantial noise at the project boundaries should be shielded with temporary noise barriers, such as barriers that meet a sound transmission class (STC) rating of 25, sound absorptive panels, or sound blankets on individual pieces of construction equipment. Stationary noise-generating equipment, such as generators and compressors, should be located as far as practically possible from the nearest residential property lines.
>
> **MM-N-4**: **Limit Operations Adjacent to Receivers**. Limit the number of large pieces of equipment (i.e., bulldozers or concrete mixers) operating adjacent to receivers to one at any given time to the extent feasible.
>
> **MM-N-5: Neighbor Notification**. Provide notification to residential occupants

nearest to the project site 7-14 days prior to initiation of construction activities that could result in noise levels exceeding 75 dBA at the property line adjacent to residences. This notification should include the anticipated hours and duration of construction and a description of noise reduction measures being implemented at the project site. The notification should include a telephone number for local residents to call to submit complaints associated with construction noise. The notification should be posted along SR-74 and be visible from adjacent properties.

In addition to the proposed mitigations per Noise Report, the proposed project will subject to the existing Mitigation Measures as previously approved for the Heber Meadows Tract #00956:

MM-TR009560-21 Noise - (Planning/Building Department). The Developer shall construct a noise barrier of six feet measured vertically from the proposed pad elevation along backyard property lines of single-family lots adjacent to Pitzer Road; all of the recommended barriers shall wrap around side yards where they meet internal streets and drainages; barriers may be earthen berms, masonry, wood, plexiglass, glass or similar material or a combination of these materials and should be solid, with no openings from the ground to the indicated height; when grading plans and architectural plans become available, an indoor noise analysis shall be conducted for two-story single-family homes adjacent to or exposed to noise levels greater than 65 dB CNEL; proposed multiple-family homes shall either be situated at least 110 feet from the centerlines of Pitzer Road and Correll Road or be provided with air conditioning or mechanical devices providing fresh air so windows can remain closed to achieve an interior noise level of 45 dB CNEL; and, future homeowners shall receive notification regarding the potential noise impacts associated with nearby agricultural and other activities.

With implementation of the above measures, construction noise impacts would be **mitigated to less than significant** levels.

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

Per Noise Study, the vibration associated with heavy equipment operation would be transitory and dissipate as the equipment passes by. However, it is possible that residents living along the southern property boundary may experience transitory vibration associated with heavy equipment operation. Implementation of Mitigation Measure **MM-TR009560-21 Noise** is expected to **mitigate impacts to less than significant** levels.

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

c) The closest airport to the project site is Calexico Airport which is located 3.5 miles to the south at 801 West Second Street in Calexico, California. The project site is located more than two miles from a public/public use airport. The project site is located outside the compatibility zone boundaries of the Imperial County Airport Land Use Compatibility Plan (ALUCP) and the Federal Aviation Administration (FAA) Part 77 Noticing Area as depicted in Figure 4E of the ALUCP (Imperial County Airports Land Use Compatibility Plan adopted, June 1996). **No impact** would occur under this threshold.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

XIV. ***POPULATION AND HOUSING*** ***Would the project:***

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

a) At build out, the project may accommodate approximately 1,173 residents assuming an average of 3.66 residents per unit per Heber Public Utility District comment letter. The project site is zoned for medium to high density residential development and it is located in an urban area as designated in the Imperial County General Plan Land Use Element. Further, the site is part of the approved Heber Meadows project (2005) which also designated the site for residential development. Thus, development of 320 units of affordable housing (at full build out) would not be unplanned or inconsistent with existing planning documents. Further, water/wastewater and related utilities are located in the area. The SR-87/Pitzer Road improvements would not cause or contribute to population growth. These would be implemented as a condition of approval associated with the Heber Meadows project approved in 2005 as referenced above. Impacts would be **less than significant** under this threshold.

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

b) The project site, Pitzer Road ROW and SR-86 ROW, do not contain housing that would be removed as a result of project implementation. No existing people or housing would be displaced. No replacement housing would be required. **No impact** would occur under this threshold.

XV. ***PUBLIC SERVICES***

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: ☐ ☐ ☒ ☐

The proposed project is not expected to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services. Compliance with HPUD requirements per comment letter dated November 3, 2021 is expected to bring impacts to **less than significant** levels.

1) Fire Protection? ☐ ☐ ☒ ☐

1) The Imperial County Fire Department provides fire protection, paramedic and emergency medical technician services to Heber and the project site. The nearest station is at 1078 Dogwood Road which is ½ mile southwest of the site. The project would increase the residential population within Imperial County; however, demand for fire services are evaluated cumulatively as part of the project review process. The project would be developed on the approved Heber Meadows site. The cumulative number of units would increase from 267 to 320 under the current proposal and the addition of 53 units would likely increase demand for fire service.

Per Heber Public Utility District comment letter dated November 3, 2021 applicant is required to provide three fire hydrants per proposed lot: Commercial fire hydrant assemblies in conformance with HPUD Standard Details and Specifications shall be placed along the 12 inch AWWA C- 900, DR 18 pvc water pipeline extending through Lots 1 through 5. A minimum of three (3) commercial

fire hydrants shall be installed in within the boundaries of each lot. The proximity and minimum distance of the commercial fire hydrants to the FDCs shall be reviewed and approved by the Imperial County Deputy Fire Marshall.
Improvements to the SR-86/Pitzer Road intersection would not affect demand for fire services. Compliance with HPUD would bring potential impacts to fire services to **less than significant** levels.

2) Police Protection? ☐ ☐ ☒ ☐

2) The project area is served by the Imperial County Sheriff Department. The department is headquartered at 328 Applestill Road, approximately 2.5 miles north of the project site. The project would increase the residential population within Imperial County; however, demand for police services is evaluated cumulatively as part of the project review process. The project would be developed on the approved Heber Meadows site. While the cumulative number of units would increase from 267 to 320 under the current proposal and the addition of 53 units would likely increase demand for police service, the additional demand is not expected to require the development of new facilities. Improvements to the SR-86/Pitzer Road intersection would not affect demand for police services. Potential impacts to police services would be **less than significant**.

3) Schools? ☐ ☐ ☒ ☐

3) At build out, the project would house approximately 1,173 people in 320 multifamily units. The Heber Elementary School District (HESD) is composed of two elementary schools that serve families with children from kindergarten through 3rd grade and 4th thru 8th grade. High School students attend Southwestern High School in the Central Union High School District. The Central Union School District (CUSD) approved a Developer Fee and Justification Study in April 2020**.** The applicant would be required to pay fees per unit to contribute a fair share to school development and modernization costs. Thus, while the number of students would increase, impacts would be **less than significant.** Improvements to the SR-86/Pitzer Road intersection would not affect demand for school services.

4) Parks? ☐ ☐ ☒ ☐

4) The project will increase use of area parks in Heber per HPUD comment letter dated November 3, 2021, therefore, the Developer/Property Owner shall be required to enter into an agreement with HPUD to offset the cost of the provision of parks and recreation services. The project is located within the Heber Meadow Community Facilities District (CFD #2005-1) Zone 2. The Developer/Applicant shall initiate the amendment of CFD #2005-1 to establish a cost recovery mechanism for the maintenance of public facilities and serving the project site.

Compliance with HPUD is expected to bring impacts to less tan significant levels. Improvements to the SR-86/Pitzer Road intersection would not affect demand for parks or recreation services. Impacts would be **less than significant**.

5) Other Public Facilities? ☐ ☐ ☒ ☐

5) Imperial County provides library and related cultural services to its residents through the Public Library System. The nearest library is the Heber Branch located at 1132 Heber Avenue approximately ½ mile northwest of the site. With respect to library services, it is possible that residents may visit the library; however, the addition of new project residents would not exceed the service population to the extent that new library facilities are required. Furthermore, a portion of the impact fees paid by the applicant will be allocated to the expansion of library facilities. Improvements to the SR-86/Pitzer Road intersection would not affect demand for library services.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

Per Imperial Irrigation District comment letter dated November 3, 2021, improvements to the intersection of SR86 (Heber Road) and Pitzer Road may impact II D's Daffodil Canal and will likely require the replacement of the existing old corrugated metal pipe crossing and lengthening it to mitigate the road improvements, which the applicant would be responsible to address environmentally and financially. It is expected that compliance with IID's requirements would bring impacts to less than **significant levels**.

XVI. ***RECREATION***

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

a) Per Heber Public Utility District (HPUD) comment letter dated November 3, 2021, HPUD is responsible for the provisions of parks and recreation in the community of Heber. An estimated on 1,173 new residents is expected as a result of the proposed project, and therefore, it will result in an increased demand of the existing parks in Heber. Therefore the following will be required:

1. The Developer/Property Owner/ shall be required to enter into an agreement with HPUD to offset the cost of the provision of parks and recreation services.

2. The project is located within the Heber Meadows Community Facilities District (CFD #2005-1) Zone 2. The Developer/Applicant shall initiate the amendment of CFD #2005-1 to establish a cost recovery mechanism for the maintenance of public facilities within and serving the project site.

The proposed project is not expected to induce to a substantial deterioration on regional parks, however, implementation of HPUD requirements for neighborhood parks and public facilities, and on-site recreational amenities are expected to lessen impacts to **less than significant levels**.

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

b) As stated, the project would provide on-site amenities for use by the residents, the improvements would occur on-site. No construction or expansion of off-site facilities would be required. Implementation of HPUD requirements as listed above would lessen impacts to less than significant levels.

XVII. ***TRANSPORTATION*** ***Would the project:***

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

The Heber Meadows (TR#00956) project has been partially developed and the project site has existing pedestrian infrastructure per Linscott, Law and Greenspan Engineers, Inc. Traffic Impact Assessment[15] (November 2020) and provided herein as Appendix I; existing sidewalks are located on Dogwood Road, McCabe Road, Pitzer Road and Correll Road within the study area. Bike facilities do not exist on McCabe Road, Pitzer Road, Correll Road and Heber Road.

[15] Linscott, Law and Greenspan Engineers, Inc. Traffic Impact Assessment

As previously mentioned, the proposed project is a legacy project from the Heber Meadows project TR#00956, therefore, it will subject to the existing Mitigation Measures as previously approved for the Heber Meadows Tract #00956:

MM-TR00956-19 On-Site/Infrastructure Improvements (Public Works Department). The Developer shall construct sidewalks along the project's frontage with Correll Road and Pitzer Road; street lighting shall be provided along the project's frontage with Correll and Pitzer road with the feasibility of providing a bus stop at the project site and having the local transit authority extend bus service into the project area shall be considered and investigated, and the Developer shall dedicate rights-of-way for bike lanes connecting to the local bike network.

MM-TR00956- 22 Traffic - (Department of Public Works/CAL TRANS). The Developer shall contribute a "fair share" towards the planned future signalization of the SR 86/1-8 westbound ramps intersection; the Developer shall contribute a fair share towards the planned future signalization of the SR 86/1-8 eastbound ramps intersection; the Developer shall contribute a fair share towards the future signalization of the Dogwood Road/Chick Road/Danenberg Road intersection and provide dedicated left-turn pockets on each approach; the Developer shall contribute a fair share towards the signalization of the Dogwood Road/Correll Road Intersection and provide dedicated westbound left-turn and right-turn lanes on Correll Road and provide a dedicated southbound left-turn land on Dogwood Road; the Developer shall provide a bond or other surety for the construction of a traffic signal at the SR 86/Pitzer Road and a dedicated eastbound left-turn lane and a dedicated westbound right-turn lane for access onto and off of SR 86 when warrants are met; the Developer shall contribute a fair share towards the signalization and associated geometric improvements of the SR 111/Jasper Road intersection; the Developer shall provide a bond or other surety for the signalization of the future access points on both Correll Road and Pitzer Road when traffic signal warrants are met and signalization shall include dedicated left-turn pockets; the Developer shall ensure that driveways to the multi-family portion of the project shall be restricted to right-turn only in the future at the discretion of the County Public Works Director; and, the Developer shall contribute a "fair share" towards the provision of a second northbound left-turn lane and a dedicated eastbound right-turn lane at the SR 111/SR 86 intersection.

Mitigation Measures MM-TR00956-19 On-Site/Infrastructure Improvements and MM-TR00956- 22 Traffic have been partially completed as some infrastructure development has been built, however it is expected that adherence to existing **mitigation would bring impacts to less than significant levels**.

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

b) Per Linscott, Law and Greenspan Engineers, Inc. as part of the Traffic Impact Assessment (April 2021)[16] the resident VMT per capita (6.88 miles) is calculated to be less than the threshold established (7.49 miles). Therefore, the transportation impact under CEQA would be **less than significant**.

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

c) Road improvements associated with the residential element of the project would include driveways on Pitzer Road on the east side of the site and East Correll Road on the north side of the

[16] Linscott, Law and Greenspan Engineers, Inc., Traffic Impact Assessment, April 2021

site. The driveways would be designed consistent with Imperial County Code Section 90301.01 – Development Standards (residential zones) to ensure safe truck and vehicle ingress/egress.

The project would add signalized control at the SR-86/Pitzer Road intersection with additional lanes to accommodate projected traffic volumes. The SR-86/Pitzer Road improvements would be designed per California Department of Transportation (Caltrans) standards for the SR-86 legs and Imperial County standards for the Pitzer Road legs.

Caltrans comments on letter dated December 14, 2021 include:

Traffic Engineering and Analysis

• For the intersection control evaluation (ICE), a benefit cost ratio between all intersection control alternatives must be provided.
• Approximate cost of utility relocation for all alternatives should be included, as part of the ICE study.
• For the ICE study the comparison between each alternative must be equivalent. For an example Table 8-1, the additional Right-of-Way (R/W) requirement should be in equal units for all alternatives.
• Provide signal traffic warrants for the signal alternative.
• Provide the Synchro files and other files used to analyze traffic for the project.

Design

Below are comments related to the proposed roadway improvements:
• Sight Distance Evaluation o Per the Highway Design Manual (HDM) Index 201.3, stopping sight distance is measured along the length of a roadway.
o For the corner sight distance measurement for the proposed signalized intersection, refer to HDM Index 405.1(2)(b) and Figure 405.1 to calculate the sight triangles.

• Existing and proposed fixed objects should comply with Clear Recovery Zone and Minimum Horizontal Clearance standards found in HDM Index 309.1(2) and (3), respectively.

o Examples of some of the existing fixed objects noticed during an online map review of the existing intersection include existing channel headwalls, elevation difference between the roadway and channel's water level, and existing utility poles. This is not a complete list of potential fixed objects for the project.

o Proposals for any traffic safety devices along SR-86/Main Street, such as metal railing or concrete barriers, must be discussed with the Traffic Operations Division.

• For new or relocated utilities, please consult the Project Development Procedures Manual, Chapter 17, Encroachments and Utilities, to ensure
compliance with current standards.

Materials Engineering

Once the preferred intersection alternative has been selected at SR-86 and Pitzer Road, please forward the proposed structural sections for review and approval. If hot mix asphalt will be used, we request for a PG 70-10 binder in this area.

The project shall comply with all Caltrans requirements on comment letter dated December 14, 2021, such compliance is expected to lessen impact to less than **significant** levels.

d)	Result in inadequate emergency access?	☐	☒	☐	☐

d) The proposed project would improve the SR-86/Pitzer Road intersection as well as construct site ingress/egress on Pitzer Road and East Correl Road. The project would open the northern leg of the SR-86/Pitzer Road intersection which is closed under existing conditions. This would facilitate Imperial County Fire Department access to the site as the response route could utilize SR-86 and

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Pitzer Road north rather than East Correl Road which is required under existing conditions.

It is expected that compliance with mitigations under item a), above, Mitigation Measure MM-TR00956- 22 Traffic and Caltrans requirements on letter dated December 14, 2021 would lessen impacts to less than significant levels.

XVIII. ***TRIBAL CULTURAL RESOURCES***

a) 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:	☐	☒	☐	☐

a) The Cultural Resources Study for the proposed project performed a cultural records research which revealed no archeological or historic built environment resources within or adjacent to the project APE. However as part of the research results, the Sacred Lands File revealed that important resources are present for Native Americans in the vicinity of the APE; native American scooping results requested tribal monitoring from two tribes; therefore, potential significant impacts could occur unless mitigation measures MM-CR-1 as discussed above under Section V Cultural Resources is incorporated.

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

(i) As stated, there are no buildings or other historic structures on the project site nor were any such resources or resources of tribal significance identified on the site in the 2005 Initial Study prepared for the Heber Meadows project. Further, no buildings or historic structures occur on the Miraluz/Heber Meadows Affordable Housing project site. The Daffodil Canal segment that would be affected by the SR-86/Pitzer Road improvements is eligible for listing in the CR-HR; however, impacts to this feature would be **less than significant.**

(ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth is 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.	☐	☒	☐	☐

(ii) As part of the Cultural Resource Report research process, a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) was requested on February 23, 2021. The NAHC sent a response on March 9, 2021, stating that a search of the SLF was completed with positive results (i.e., sacred lands or resources important to Native Americans are recorded within the vicinity of the project APE). The letter recommended that the Torres-Martinez Desert Cahuilla Indians and the Ewiiaapaayp Band of Kumeyaay Indians be contacted for more information.

On March 9, 2021, letters were mailed to the NAHC-listed contacts describing the project and asking if they had knowledge regarding cultural resources of Native American origin within or near the APE. A letter was also emailed to Cultural Resources Director Michael Mirelez of the

Torres-Martinez Desert Cahuilla Indians and Chairperson Robert Pinto of the Ewiiaapaayp Band of Kumeyaay Indians on March 9, 2021, to encourage dialogue.

On March 17, 2021, Quechan Indian Tribe Historic Preservation Officer H. Jill McCormick responded via email stating that the tribe had no comments regarding the project.

On March 17, 2021, Anza sent emails to remaining contacts with copies of the letters attached and providing an additional opportunity to comment or ask questions regarding the proposed undertaking.

On email dated October 28, 2021 the Viejas Band of Kumeyaay Indians ("Viejas") reviewed the project and determined that the project site has cultural significance of ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project. Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new development such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

On email received on October 30, 2021, La Posta Band of Mission Indians stated that for any ground disturbance they will to see a native monitor on site for any artifacts that may be there.

Based on emails received from La Posta Band of Mission Indians and Viejas Band of Kumeyaay Indians ("Viejas") impacts could be significant, however incorporation of Mitigation Measure MM-CR-1 as discussed above under Section V Cultural Resources will bring impacts to **less than significant levels**.

XIX. ***UTILITIES AND SERVICE SYSTEMS*** ***Would the project:***

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

a) The proposed project would tie into existing water and sewer lines located in Pitzer Road and East Carroll Road. The Heber Public Utilities District owns, operates and maintains a Wastewater Treatment System which provides services to the Heber community, and areas immediately outside of the District boundary, but within the Sphere of Influence. The project at build out would provide 320 units. This would be within the allowable number of units that could be accommodated by the existing plant based on HPUD comment letter dated November 3, 2021, the letter also mentions HPUD requirements for the proposed project's domestic water, sanitary sewer, and stormwater drainage services. Compliance with all requirements per Heber Public Utilities District comments on letter dated November 3, 2021 is expected to bring any impacts to **less than significant** levels.

Additionally shall comply with Imperial Irrigation District comments per letter dated December 2, 2020:

1. To initiate the process to obtain electric service for phase 1 of the project (60 apartment units), the applicant should be advised to contact Joel Lopez, the IID Service Planner for the area, at (760) 482-3444 or e-mail Mr. Lopez at tflopez@iid.com. In addition to submitting a formal application (available for download at the district website at http://www.iid.com/home/showdocument?id=12923), the applicant will be required to submit a complete set of approved plans, including any photo-voltaic installation drawings for the PV component of the project, {hard copy and CAD files); project schedule, estimated in-service date, electrical loads, panel size, panel locations, voltages, accessibility to operate and maintain IID equipment, and the applicable fees, permits, easements and

environmental compliance documentation pertaining to the provision of electrical service to the project. The applicant shall be responsible for all costs and mitigation measures related to providing electrical service to the project.

2. Please note that electrical capacity is limited in the area. A circuit study may be required-. Any improvements identified in the circuit study to allow electrical service to the development project shall be the financial responsibility of the applicant.
3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). The IID encroachment permit application and instructions are available for download at the district website https://www.iid.com/about-iid/department-directory/real-estate. The IID Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements.
4. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IIO's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.
5. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.

It is expected that applicant's compliance with IID and HPUD would bring impacts to **less than significant levels**, no significant environmental effects are expected.

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

b) According to HPUD comment letter dated November 3, 2021, the 2018 HPUD Service Area plan the per capita housing density is 3.91 persons/residence (or apartment unit). The HPUD Service Area plan noted the per capita water usage is 125 gallons/person/day. The total water usage for each parcel comprised of 60 apartment units is; 60 apartment units x 3.91 persons/unit x 125 gallons/person/day= 29,325 gallons per day. The total water usage for the entire proposed development (Parcels 1 through 5) is 5 parcels x 29,325 gallons/parcel= 146,625 gallons per day for all 300 apartment units at full buildout.

The irrigation usage for the common open space is included in the per capita apartment domestic water demand. The Community Building and Swimming Pool (if applicable) water demands are anticipated to be minimal compared to the apartment usage demands. It is anticipated the Community Building water demand wilt be approximately 675 gallons/day.
The anticipated water demand for each parcel is anticipated to be 29,325 gallons per day (apartments) + 675 gallons/day (Community Center) = 30,000 gallons per day/parcel. The anticipated water demand for the entire 5 parcel development at full build out is anticipated to be

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30,000 gallons/parcel x 5 parcels = 150,000 gallons per day.
The HPUD Water Treatment Plant (WTP) rated capacity is 4.0 Million Gallons per Day. The WTP peak flow recorded for the last full year of flow records in 2019 was 1.536 MGD. The WTP excess capacity is 4.0 MGD - 1.536 MGD = 2.464 MGD. HPUD is committed to serve water service to other approved developments in the approximate amount of 0.15 MGD. HPUD has a non-committed excess capacity of 2.464 - 0.15 = 2.314 MGD. If HPUD approved water service to the proposed development the HPUD non-committed excess capacity would be 2.314 MGD - 0.150 MGD = 2.164 MGD. Therefore, HPUD is expected to have sufficient WTP capacity to serve the proposed development.
Per HPUD, the developer of the proposed project will be required to submit a "Will Serve" request letter to HPUD. HPUD will consider and respond to the "Will Serve" request letter upon its receipt. Developer/applicant agreed to this items based on response letter dated September 7, 2021. Compliance with HPUD requirements would bring impacts to **less than significant** levels.

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

c) The HPUD Wastewater Treatment Plant (WWTP) rated capacity is 1.2 Million Gallons per Day. The WWTP monthly average high discharge flow in 2019 was 0.80 MGD. The WWTP excess capacity is 0.40 MGD. HPUD is committed to serve wastewater service to other approved developments in the approximate amount of 0.10 MGD. HPUD has a non-committed excess WWTP capacity of 0.40 - 0.10 = 0.30 MGD. It is estimated the wastewater generated from the proposed fully developed project will be 0.10 MGD. The HPUD non-committed excess WWTP capacity a'fter service is provided to the proposed development will be 0.30 MGD - 0.10 MGD = 0.20 MGD. Therefore, HPUD has sufficient wastewater capacity to service the proposed development. Impacts are expected to be **less than significant**.

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

d) All solid waste shall be disposed of in an approved solid waste disposal site in accordance with existing County, State, and Federal regulations. Solid waste services including collection, transportation, recycling and disposal of solid waste, recyclable and compostable materials, is provided by CR&R Incorporated. CR&R disposes of collected solid waste at the Imperial Allied Waste Landfill, a privately-owned landfill, located at 104 East Robinson Road, within an unincorporated area, east of the City of Imperial. The landfill has an expected closure date of December 31, 2040. Impacts would be **less than significant** under this threshold.

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

e) The applicant and project contractor shall comply with all local, state, and federal requirements for integrated waste management (e.g., recycling, green waste) and solid waste disposal as required by the CIWMA of 1989 and AB 341. The County of Imperial condition the project to provide recycling as required to facilitate recycling of residential waste and related materials (i.e., paper, carboard, cans, bottles). **Less than significant** impacts are expected.

XX. *WILDFIRE*

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:

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

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

a) The project would result in improvements to the Pitzer Road/SR-86 intersection which would facilitate emergency access or evacuation out of the area if needed. The site and much of central Imperial County is not located within a Fire Hazard Safety Zone as defined by the California Department of Forestry https://egis.fire.ca.gov/FHSZ/. The site is located within a Local Responsibility Area per the California Department of Forestry Imperial County Fire Hazard Severity Zones in SRA; thus, fire and emergency services would be provided by the Imperial County Fire Department. Impacts would be **less than significant**.

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

b) The project site is flat and surrounded by residential and commercial uses, public facilities and agricultural land. With the exception of landscaped areas, the Miraluz site would be paved and/or covered with impervious surfaces. The developed areas would not be located upslope from heavily vegetated areas that would present a fire hazard in the event a fire were to occur in the area. While unlikely based on topography and surrounding land use, like all of southern California, it is possible that wildfires occurring in the general area could expose residents to pollutant concentrations based on proximity and wind direction.

The site is not located in a Fire Hazard Severity Zone and is with a Local Responsibility Area as stated. Materials used in the construction of the buildings would be consistent with the Uniform Fire Code (Imperial County Code Chapter 8.20) and are intended to minimize or avoid fire-related impacts. The project would minimize the exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires. Impacts would be **less than significant.**

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

c) The project would require the installation of paved surface and above ground improvements. The site is surrounded by agricultural land and/or developed property. No infrastructure would be needed for wildfire control. Impacts would be **less than significant.**

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

d) As referenced, the project site is flat. No steep slopes occur nor would they be created as a result of the project. In the unlikely event that a wildfire were to occur, the topography would not result in downstream flooding or landslides resulting from runoff, post-fire slope instability or drainage changes. **No impact** would occur under this threshold.

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino, (1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.
Revised 2009- CEQA
Revised 2011- ICPDS
Revised 2016 – ICPDS
Revised 2017 – ICPDS
Revised 2019 – ICPDS

SECTION 3
III. MANDATORY FINDINGS OF SIGNIFICANCE

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

a)	**Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, eliminate tribal cultural resources or eliminate important examples of the major periods of California history or prehistory?**	☐	☐	☐	☐
b)	**Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**	☐	☐	☐	☐
c)	**Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?**	☐	☐	☐	☐

IV. PERSONS AND ORGANIZATIONS CONSULTED

This section identifies those persons who prepared or contributed to preparation of this document. This section is prepared in accordance with Section 15129 of the CEQA Guidelines.

A. COUNTY OF IMPERIAL

- Jim Minnick, Director of Planning & Development Services
- Michael Abraham, AICP, Assistant Director of Planning & Development Services
- Diana Robinson, Planning Manager
- Mariela Moran, Project Planner
- Imperial County Air Pollution Control District
- Department of Public Works
- Fire Department
- Ag Commissioner
- Environmental Health Services

B. OTHER AGENCIES/ORGANIZATIONS

- California Department of Transportation, District 11
- Heber Public Utility District
- Quechan Indian Tribe

(Written or oral comments received on the checklist prior to circulation)

V. REFERENCES

1. "County of Imperial General Plan EIR", prepared by Brian F. Mooney & Associates in 1993; and as Amended by County in 1996, 1998, 2001, 2003, 2006 & 2008, 2015, 2016.

2. Imperial County Heber Urban Area Plan. Available at: https://www.icpds.com/assets/planning/community-plans/heber-urban-area-plan.pdf

3. Birdseye Planning Group, LLC, Air Quality and Greenhouse Gas Technical Report, May 2021

4. Natural Environment Study – Minimal Impact report, ELMT Consulting, Inc

5. Cultural Resources Study for the Heber Meadows Subdivision Project, Community of Heber, Imperial County, California, Anza Resource Consultants, Inc., March 2021

6. Cultural Resources Study for the State Route 86 at Pitzer Road Intersection Improvement Project, Anza Resource Consultants, Inc., June 2021

7. Landmark Consultants, Inc., Geotechnical Report for the Proposed Heber Meadows Apartments, December 2020.

8. Imperial County General Plan Seismic/Public Safety Element

9. Imperial County Conservation and Open Space Element

10. Phase I Environmental Site Assessment for Heber Meadows prepared by Advantage Environmental Consultants, July 2020

11. Imperial County Airport Land Use Compatibility Plan adopted June 1996.

12. Fire Hazard Severity Zone Map, California Department of Forestry. Available at https://egis.fire.ca.gov/FHSZ/

13. Preliminary Hydrology Study for Tract 00992 Miraluz, Heber, CA, prepared by Egan Civil Engineering, Inc., March 2021

14. Noise Report, Birdseye Planning Group, May 2021

15. Linscott, Law and Greenspan Engineers, Inc. Traffic Impact Assessment, November 2020

16. Linscott, Law and Greenspan Engineers, Inc.,Traffic Impact Assessment, April 2021

VI. NEGATIVE DECLARATION – County of Imperial

The following Negative Declaration is being circulated for public review in accordance with the California Environmental Quality Act Section 21091 and 21092 of the Public Resources Code.

Project Name: Miraluz Affordable Housing and State Route 86/Pitzer Road Intersection Improvement Project

Project Applicant: Heber Meadows I, LP
6339 Paseo Del Lago
Carlsbad, CA 92011
Contact: David Davis, Development Manager

Project Location: The Miraluz Affordable Housing project is proposed on a 16-acre site located at 175 East Correll Road southwest of the Pitzer Road/ East Correll Road intersection in the town of Heber, unincorporated Imperial County, California (Assessor Parcel Number 054-601-016). The site is located within the Heber Area Plan in the townsite of Heber. The State Route 86/Pitzer Road improvements would generally extend 1,000 feet in each direction from the center of the existing intersection which is located approximately 2,000 feet south of the Miraluz site.

Description of Project: The proposed project would subdivide APN 054-601-016 (16.22 Acres) into five lots for the purpose of constructing a phased affordable housing project:

Parcel 1: 2.96 Acres (Phase I)
Parcel 2: 2.89 Acres
Parcel 3: 2.96 Acres
Parcel 4: 3.37 Acres
Parcel 5: 3.47 Acres
Lot "A": 0. 60 Acres (for future access)

A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The current project site was part of the larger project area but was never developed.

A condition of approval associated with the Heber Meadows project required improvements to the SR-86/Pitzer Road intersection located approximately 2,000 feet south of the site. The northern Pitzer Road leg from SR-86 is currently closed. The southern Pitzer Road leg is stop controlled. The east/west movement is uncontrolled under existing conditions. The recommended improvements would install a new traffic signal with geometric improvements. The fourth (north) leg would be constructed at this intersection which will provide direct access from SR 86 to the north, connecting to East Correll Road.

VII. FINDINGS

This is to advise that the County of Imperial, acting as the lead agency, has conducted an Initial Study to determine if the project may have a significant effect on the environment and is proposing this Negative Declaration based upon the following findings:

☐ The Initial Study shows that there is no substantial evidence that the project may have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☐ The Initial Study identifies potentially significant effects but:

(1) Proposals made or agreed to by the applicant before this proposed Mitigated Negative Declaration was released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

(2) There is no substantial evidence before the agency that the project may have a significant effect on the environment.

(3) Mitigation measures are required to ensure all potentially significant impacts are reduced to levels of insignificance.

A MITIGATED NEGATIVE DECLARATION will be prepared.

If adopted, the Negative Declaration means that an Environmental Impact Report will not be required. Reasons to support this finding are included in the attached Initial Study. The project file and all related documents are available for review at the County of Imperial, Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 (442) 265-1736.

NOTICE

The public is invited to comment on the proposed Negative Declaration during the review period.

Date of Determination Jim Minnick, Director of Planning & Development Services

The Applicant hereby acknowledges and accepts the results of the Environmental Evaluation Committee (EEC) and hereby agrees to implement all Mitigation Measures, if applicable, as outlined in the MMRP.

Applicant Signature Date

SECTION 4

VIII. RESPONSE TO COMMENTS

(ATTACH DOCUMENTS, IF ANY, HERE)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP)

(ATTACH DOCUMENTS, IF ANY, HERE)

MITIGATION, MONTORING AND REPORTING PROGRAM

MITIGATION MEASURES
PURSUANT TO THE ENVIRONMENTAL EVALUATION COMMITTEE
January 27, 2022
Miraluz Affordable Housing Tract Map
[TR#00992, IS #22-0002]
(APN 054-601-016-000)
(CEQA – Mitigated Negative Declaration)

Pursuant to the review and recommendations of the Imperial County Environmental Evaluation Committee (EEC) on January 27, 2022, the following Mitigation Measures are hereby proposed for the project:

AIR QUALITY

AQ-1a: Prior to commencing construction, the project applicant will be required to submit a Dust Control Plan to the ICAPCD for approval. The Dust Control Plan will identify all sources of PM_{10} emissions and associated mitigation measures during the construction and operational phases (see Rule 801 F.2). The applicant shall submit a "Construction Notification Form" to the ICAPCD 10 days prior to the commencement of any earthmoving activity. The Dust Control Plan submitted to the ICAPCD shall meet all applicable requirements for control of fugitive dust emissions, including the following measures designed to achieve the no greater than 20-percent opacity performance standard for dust control and address the following parameters:

- All disturbed areas, including bulk material storage that is not being actively used, shall be effectively stabilized; and visible emissions shall be limited to no greater than 20-percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material, such as vegetative groundcover. Bulk material is defined as earth, rock, silt, sediment, and other organic and/or inorganic material consisting of or containing particulate matter with 5 percent or greater silt content. For modeling purposes, it was assumed that watering would occur twice daily.

- All on-site unpaved roads segments or areas used for hauling materials shall be effectively stabilized. Visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by restricting vehicle access, paving, application of chemical stabilizers, dust suppressants and/or watering.

- The transport of bulk materials on public roads shall be completely covered, unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks shall be cleaned and/or washed at the delivery site after removal of bulk material, prior to using the trucks to haul material on public roadways.

- All track-out or carry-out on paved public roads, which includes bulk materials that adhere to the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto the pavement, shall be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area sheltering or enclosing the operation and transfer line except where such material or activity is exempted from stabilization by the rules of ICAPCD.

AQ-1b: Each project proponent shall implement all applicable standard measures for construction combustion equipment for the reduction of excess NOX emissions as contained in the Imperial County CEQA Air Quality Handbook and associated regulations. These measures include:

- Use alternative-fueled or catalyst-equipped diesel construction equipment, including all off-road and portable diesel-powered equipment.

- Minimize idling time, either by shutting equipment off when not in use or reducing the time of idling to five minutes at a maximum.

- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use. Replace fossil-fueled equipment with electrically driven equivalents (assuming powered by a portable generator set and are available, cost effective, and capable of performing the task in an effective, timely manner).

- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing construction activity during the peak hour of vehicular traffic on adjacent roadways.

- Implement activity management (e.g., rescheduling activities to avoid overlap of construction phases, which would reduce short-term impacts).

(Monitoring Agency: Imperial County Planning and Development Services, Air Pollution Control District; Timing: Prior to permit approval and During Construction)

BIOLOGICAL RESOURCES

MM- BIO-1: Within three (3) days prior to ground disturbance, the construction area and adjacent areas within 500 feet of the Project footprint, will be surveyed by an Acceptable Biologist for burrows that could be used by burrowing owl. If a suitable burrowing owl burrow is observed, the biologist will determine if the burrow has recently been used or if an owl is present in the burrow. If the burrow is determined to be occupied, the burrow will be flagged and a 200-foot buffer during the non-breeding season and a 500-foot buffer during the breeding season or a buffer to the edge of the property boundary if less than 500 feet, will be established around the burrow. The buffer will be staked and flagged. No construction activities will be permitted within the buffer until the young are no longer dependent on the burrow. In coordination with CDFW, the no work buffer can be reduced depending on the behavior of the burrowing owls, topography, existing vegetation, human development, and land uses in an area.

It is recommended that a biological monitor be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest becomes inactive under natural conditions, construction activities may resume within the buffer area.

If the burrow is unoccupied, the burrow will be made inaccessible to owls, and construction activities may proceed. If either a nesting or escape burrow is occupied, owls shall be relocated pursuant to accepted Wildlife Agency protocols. A burrow is assumed occupied if records indicate that, based on surveys conducted following protocol, at least one burrowing owl has been observed occupying a burrow on site during the past three years. If there are no records for the site, surveys must be conducted to determine, prior to construction, if burrowing owls are present. Determination of the appropriate method of relocation, such as eviction/passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

In addition to a pre-construction clearance survey, a Worker Environmental Awareness Program (WEAP) shall be conducted prior to the start of construction, focusing on the avoidance and minimization of impacts to burrowing owl during construction.

MM-TR00956-20: Burrowing Owl Survey (California Dept. of Fish and Game). The Developer shall do a pre-construction survey for burrowing owls within one month of the commencement of earth disturbance (grading or construction) on the project site; if the pre-construction survey determines that no burrowing owls are on the project site, all on-site burrows shall be caved prior to the commencement of earth disturbance; and if the survey determines that burrowing owls are on-site, adult owls shall be captured and relocated to an off-site reserve and other measures to mitigate potential impacts to the burrowing owl are available and can be negotiated with the California Department of Fish and Game as appropriate.

(Monitoring Agency: Imperial County Planning Department, California Department of Fish and Game; Timing: Prior to construction, During Construction)

CULTURAL RESOURCES

MM-CR-1: A Kumeyaay Cultural Monitor shall be on site for ground disturbing activities and to inform the Tribes of any new development such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

(Monitoring Agency: Imperial County Planning Department; Timing: During construction)

NOISE

MM-N-1. All equipment will have sound-control devices that are no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust.

MM-N-2. As directed by Caltrans, the contractor will implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

MM-N-3: Construction Equipment. Electrical power shall be used to run air compressors and similar power tools. Internal combustion engines should be equipped with a muffler of a type recommended by the manufacturer and in good repair. All diesel equipment should be operated with closed engine doors and should be equipped with factory-recommended mufflers. Construction equipment that continues to generate substantial noise at the project boundaries should be shielded with temporary noise barriers, such as barriers that meet a sound transmission class (STC) rating of 25, sound absorptive panels, or sound blankets on individual pieces of construction equipment. Stationary noise-generating equipment, such as generators and compressors, should be located as far as practically possible from the nearest residential property lines.

MM-N-4: **Limit Operations Adjacent to Receivers**. Limit the number of large pieces of equipment (i.e., bulldozers or concrete mixers) operating adjacent to receivers to one at any given time to the extent feasible.

MM-N-5: Neighbor Notification. Provide notification to residential occupants nearest to the project site 7-14 days prior to initiation of construction activities that could result in noise levels exceeding 75 dBA at the property line adjacent to residences. This notification should include the anticipated hours and duration of construction and a description of noise reduction measures being implemented at the project site. The notification should include a telephone number for local

residents to call to submit complaints associated with construction noise. The notification should be posted along SR-74 and be visible from adjacent properties.

MM-TR009560-21 Noise - (Planning/Building Department). The Developer shall construct a noise barrier of six feet measured vertically from the proposed pad elevation along backyard property lines of single-family lots adjacent to Pitzer Road; all of the recommended barriers shall wrap around side yards where they meet internal streets and drainages; barriers may be earthen berms, masonry, wood, plexiglass, glass or similar material or a combination of these materials and should be solid, with no openings from the ground to the indicated height; when grading plans and architectural plans become available, an indoor noise analysis shall be conducted for two-story single-family homes adjacent to or exposed to noise levels greater than 65 dB CNEL; proposed multiple-family homes shall either be situated at least 110 feet from the centerlines of Pitzer Road and Correll Road or be provided with air conditioning or mechanical devices providing fresh air so windows can remain closed to achieve an interior noise level of 45 dB CNEL; and, future homeowners shall receive notification regarding the potential noise impacts associated with nearby agricultural and other activities.

(Monitoring Agency: Imperial County Planning Department; Timing: Prior construction, During construction)

TRANSPORTATION

MM-TR00956-19 On-Site/Infrastructure Improvements (Public Works Department). The Developer shall construct sidewalks along the project's frontage with Correll Road and Pitzer Road; street lighting shall be provided along the project's frontage with Correll and Pitzer road with the feasibility of providing a bus stop at the project site and having the local transit authority extend bus service into the project area shall be considered and investigated, and the Developer shall dedicate rights-of-way for bike lanes connecting to the local bike network.

MM-TR00956- 22 Traffic - (Department of Public Works/CAL TRANS). The Developer shall contribute a "fair share" towards the planned future signalization of the SR 86/1-8 westbound ramps intersection; the Developer shall contribute a fair share towards the planned future signalization of the SR 86/1-8 eastbound ramps intersection; the Developer shall contribute a fair share towards the future signalization of the Dogwood Road/Chick Road/Danenberg Road intersection and provide dedicated left-turn pockets on each approach; the Developer shall contribute a fair share towards the signalization of the Dogwood Road/Correll Road Intersection and provide dedicated westbound left-turn and right-turn lanes on Correll Road and provide a dedicated southbound left-turn land on Dogwood Road; the Developer shall provide a bond or other surety for the construction of a traffic signal at the SR 86/Pitzer Road and a dedicated eastbound left-turn lane and a dedicated westbound right-turn lane for access onto and off of SR 86 when warrants are met; the Developer shall contribute a fair share towards the signalization and associated geometric improvements of the SR 111/Jasper Road intersection; the Developer shall provide a bond or other surety for the signalization of the future access points on both Correll Road and Pitzer Road when traffic signal warrants are met and signalization shall include dedicated left-turn pockets; the Developer shall ensure that driveways to the multi-family portion of the project shall be restricted to right-turn only in the future at the discretion of the County Public Works Director; and, the Developer shall contribute a "fair share" towards the provision of a second northbound left-turn lane and a dedicated eastbound right-turn lane at the SR 111/SR 86 intersection.

(Monitoring Agency: Imperial County Planning Department, Imperial County Public Works Department, Caltrans; Timing: Prior Construction, During construction)

Attachment
"Project Application & TR#00956 COA"

MAJOR SUBDIVISION

I.C. PLANNING & DEVELOPMENT SERVICES DEPT
801 Main Street, El Centro, CA 92243 (760) 482-4236

- APPLICANT MUST COMPLETE ALL NUMBERED (black) SPACES – Please type or print -

1.	PROPERTY OWNER'S NAME Heber Meadows Land Holdings LLC (David Davis)	EMAIL ADDRESS ddavis@chelseainvestco.com	
2.	MAILING ADDRESS 6339 Paseo Del Lago, Carlsbad, CA	ZIP CODE 92011	PHONE NUMBER 619-987-7780
3.	ENGINEER'S NAME Egan Civil Engineering	CA. LICENSE NO. 73070	EMAIL ADDRESS began@egancivil.com
4.	MAILING ADDRESS 42945 Madio Street, Suite A, Indio, CA	ZIP CODE 92201	PHONE NUMBER 760-404-7663
5.	PROPERTY (site) ADDRESS 185 Willowbrook Way, Heber, CA 92249	LOCATION Southwest coener of Correll Road and Pitzer	
6.	ASSESSOR'S PARCEL NO. 054-601-016-000	SIZE OF PROPERTY (in acres or square foot) 16.22 Acres	706,702 Square Feet
7.	LEGAL DESCRIPTION (attach separate sheet if necessary) See attached Title Report		
8.	EXPLAIN PURPOSE/REASON FOR SUBDIVISION Creat 5 lots for Affordable Mulit Family Apartments		

9. Proposed DIVISION of the above specified land is as follows:

PARCEL	SIZE in acres or sq. feet	EXISTING USE	PROPOSED USE	ZONE
1 ~~or A~~	2.96	Vacant	Residential	R-3
2 ~~or B~~	2.89	Vacant	Residential	R-3
3 ~~or C~~	2.96	Vacant	Residential	R-3
4 ~~or D~~	3.37	Vacant	Residential	R-3
5	3.47	Vacant	Residential	R-3

PLEASE PROVIDE CLEAR & CONCISE INFORMATION (ATTACH SEPARATE SHEET IF NEEDED)

10.	DESCRIBE PROPOSED SEWER SYSTEM(s)	Sewer will tie into the exist sewer adjacent tot he property
11.	DESCRIBE PROPOSED WATER SYSTEM	Water will tie into the existing water system adjacent to the property
12.	DESCRIBE PROPOSED ACCESS TO MERGED PARCEL	New cul-de-sac will provide access and one lot from Pitzer
13.	IS THIS PARCEL PLANNED TO BE ANNEXED? ☐ Yes ☒ No	IF YES, TO WHAT CITY or DISTRICT?

X

David Davis 4-13-2021
Print Name (owner) Date

David S. Davis
Signature (owner)

David Davis 4-13-2021
Print Name (Agent) Date

David S. Davis
Signature (Agent)

REQUIRED SUPPORT DOCUMENTS

A. TENTATIVE MAP
B. PRELIMINARY TITLE REPORT (6 months or newer)
C. FEE
D. OTHER

Special Note:
An notarized owners affidavit is required if application is signed by Agent

APPLICATION RECEIVED BY	MMC	DATE	9/7/21
APPLICATION DEEMED COMPLETE BY		DATE	
APPLICATION REJECTED BY		DATE	
TENTATIVE HEARING BY		DATE	
FINAL ACTION ☐ APPROVED ☐ DENIED		DATE	

REVIEW / APPROVAL BY OTHER DEPTS required
☐ P W
☐ P H S
☐ A P C D
☐ O E S
☐
☐

TR# 00992

Miraluz Affordable Housing Project

Project Description

Project Name: Miraluz Affordable Apartments

Property Ownership: Heber Meadows I, LP
6339 Paseo Del Lago
Carlsbad, CA 92011
Contact: David Davis, Development Manager
Email: ddavis@chelseainvestco.com
Cell: 619-987-7780

History / Background: The original entitlements for Heber Meadows consisted of a General Plan Amendment, Zone Change, Lot Line Adjustment and Tentative Tract Map including a CEQA Mitigated Negative Declaration. Heber Meadows was approved by the Board of Supervisors on August 3, 2004. This was known as the "Heber Meadows Tract Map # 956 Subdivision". A final map for Heber Meadows Tract 956 Unit 1 was recorded June 2, 2005 as document # 05-71309. This map divided the original property into several lettered lots "A" through "F" and 50 single family homes. Lot A (8.37 acres) is now the Heber Public Utility District (HPUD) Water Treatment Plan (WTP). Lot B (6.23 acres) is the location of an existing retention basin for storm water. Lot C (3.69 acres) is the location of the existing Heber Meadows Park. Lot D (16.22 acres) is the subject site for this application for affordable housing. Lot E is a small parcel deeded to an adjacent property. Lot F was further subdivided into 126 single family homes. A portion of lot F is a remainder parcel (7.56 acres) which is currently vacant land located along Pitzer Road. The original Conditions of Approval for Heber Meadows Tract Map # 956 contain of 69 conditions along with a Mitigated Negative Declaration (MND) State Clearing House # 2004031098.

Project Location: The Miraluz Affordable Housing project is being proposed on a 16.22 acre site located at 185 East Willowbrook Way, in the southwest corner of Pitzer Road and East Correll Road. The project is located in the town of Heber, unincorporated Imperial County, California (Assessor Parcel Number 054-601-016). The site is currently zoned Residential (R-3), High Density Residential which allows up to 29 du/acre with an eighty foot height limit.

Description of the Proposed Project: The phase 1, lot 1 which is a 2.95 acre project would construct 64 apartments for low income families at a density of 21.7 du/acre. Subsequent phases would follow based on funding availability and market demand. The phase 1 project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements. A public cul-de-sac from Correll Road known as Willowbrook Place would provide the main access to lots 1 through 4. The proposed project would require a tentative and final map in order to subdivide the 16.22 acres (APN 054-601-016) into five lots. These lots would create legal lots to build future affordable or market rate housing projects. For this analysis a maximum total of 320 units are projected.

The original conditions of approval for the Heber Meadows project contain conditions which have been completed, unsatisfied conditions and other conditions which are no longer applicable. One of the major outstanding conditions is the requirement to signalize

the intersection of SR-86 and Pitzer Road. On June 26, 2020 the phase 1 project was awarded an Infill Infrastructure Grant (IIG) for $2,315,268 in order to pay for this signalized intersection. Additional funding was included to pay for the Willowbrook cul-de-sac and a sidewalk to the elementary school located west of the project. Even though the project is only required to construct a portion of this signalized intersection, the IIG funding will allow the intersection to be built out per the original conditions of approval. This would offset any other fair share contributions which are incidental in comparison.

Because the original project CEQA reports/documents were approved in in 2004, it was determined to update certain reports such as traffic, noise, biology, cultural, air quality and greenhouse gases. A new Initial Study will be prepared not only for the site, but also for the impacts to the SR-86 and Pitzer Intersection. The County is the lead agency and the approved CEQA documents will be required in order to obtain entitlements and the encroachment permit from Caltrans.

The project proponent is continuing to work closely with Caltrans and Imperial Irrigation District (IID) to prepare final engineering plans for the intersection of SR-86 and Pitzer Road.

The project site is bordered by cultivated agricultural land to the north and east; single-family residential to the south (i.e., Heber Meadows) and the Heber Meadows (Jiggs Johnson) Neighborhood Park and the retention basin to the west.

The zoning for the property is R3 "High Density Residential Zones" according to the Heber and Imperial County's zoning code. This zone is intended as an area for the development of residential apartments with provisions for adequate light, air, open space and landscaped areas at a maximum density of 29 units per net acre. The project may utilize waivers or incentives per state affordable housing laws, but these, if any will to be determined during further County review.

Phase 1 ESA: The phase 1 document was prepared in July 2020, revealed no evidence of recognized environmental conditions (RECs) in connection with the property and recommended no additional investigation or remediation.

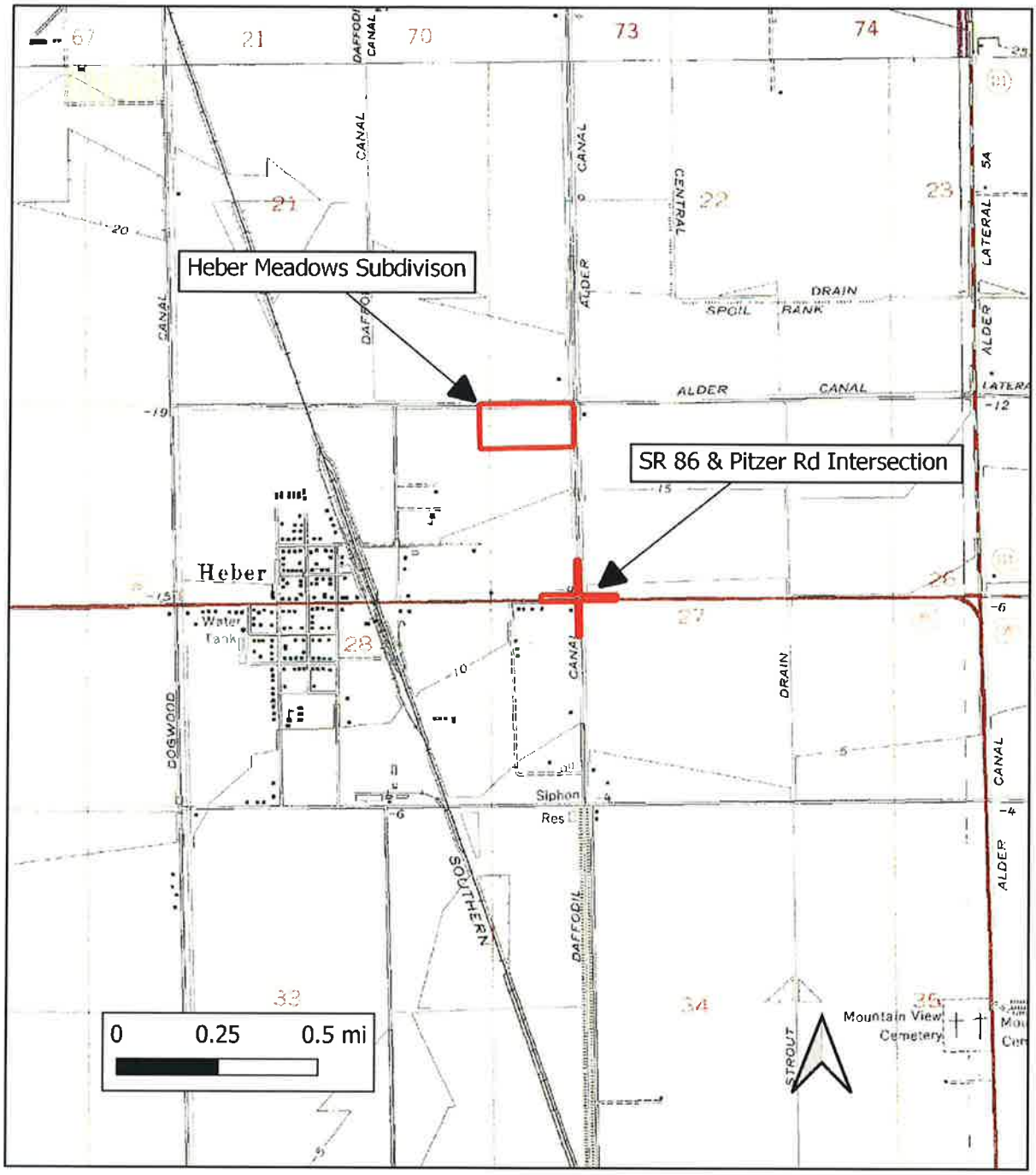
Existing Site Conditions: The 16.22 acre site is vacant and has been disturbed by illegal dumping and off-highway vehicle (OHV) use. Weed abatement takes place periodically to maintain the property. The roadways adjacent to the property are fully improved with curb, gutter, sidewalks, water, sewer and storm drain.

Geotechnical Report: A geotechnical report was prepared by Landmark Consultants Inc. dated December 2020. The report concluded standard construction technics with no abnormal subsurface conditions.

Traffic Report: In order to determine any fair share contributions or direct traffic impacts and new traffic report was prepared November 2019. This report was reviewed by Imperial County and Caltrans. An Intersection Control Evaluation (ICE) was prepared in

March 2021 for review by Imperial County and Caltrans. The purpose of this report was to determine if a signalized intersection, stop control or a round-about would be appropriate for the intersection.

Architecture: The architecture site plan has four 16-unit buildings with a separate 1,960 sf community room. The community room will include offices, a lounge, computer center, laundry, kitchen, bathrooms, storage room and a maintenance room. The apartment sizes will consist of 16 1-bedroom (583 sf), 32 2-bedroom (742 sf) and 16 3-bedroom (938 sf) units. The building design is a two story walk up (30' height) with hip and gable style concrete tile roofs. The elevation shows articulation and pop-outs to enhance the appearance of the buildings both on-site and from adjacent neighbors. The buildings will be separated from the single family homes to the south by a six foot block wall, landscaping and a parking isle. This will place the buildings over 80 feet from the property line. Decks and patios have been eliminated to eliminate clutter and further provide privacy to the existing homes. Amenities on site include a basketball court, benches, a tot lot equipment/play area, shade sails, turf areas, a BBQ, and a community garden. Parking requirements for the project are 90 spaces. The project will provide 117 spaces. Carports will be constructed with solar to offset energy requirements and reduce energy bills. The site will be gated with tubular steel surrounding the site with the exception of the block wall along the southern boundary. The project will include a live-in on-site manager who works at the property and is available for emergencies. The buildings along with the landscaping will be professionally maintained.



Project Location Map

Heber, CA

anza

HEBER MEADOWS TR 956 UNIT 1 & UNIT 2 & UNIT 3
FM 23-39 FM 23-67 FM 25-50
54-60
Tax Area Code
66-002
DISCLAIMER:
THIS IS NOT AN OFFICIAL MAP.
THIS MAP WAS CREATED FOR THE IMPERIAL COUNTY ASSESSOR, FOR THE SOLE PURPOSE OF AIDING IN THE PERFORMANCE OF DUTIES OF THE ASSESSOR. ANY ERRORS IN OR OMISSIONS FROM THIS MAP ARE THE RESPONSIBILITY OF THE COUNTY OF IMPERIAL OR THE ASSESSOR. (REV. & TAX. CODE SEC.327)
09-20-06 LC
12-13-05 RM 7-18-11 MF
08-15-05 RM 2-17-11 MF
FROM 54-54 4-12-10 MF
SUNNYSIDE CT
BLOOMFIELD ST
FAIRFIELD WAY
GOLDFIELD WAY
HARMONY WAY
MERIDIAN ST
LITTLEFIELD WAY
CORRELL RD
PITZER RD
WILLOWBROOK WAY
0.73AC
7.50AC
54
14
24
605
604
603
602
601
606
Assessors Map Bk.54-Pg.60
County of Imperial, Calif.

STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Biological Study Area

0 125 250 500
Feet

Source: ESRI Aerial Imagery, World Transportaiton, Imperial County

Exhibit 3

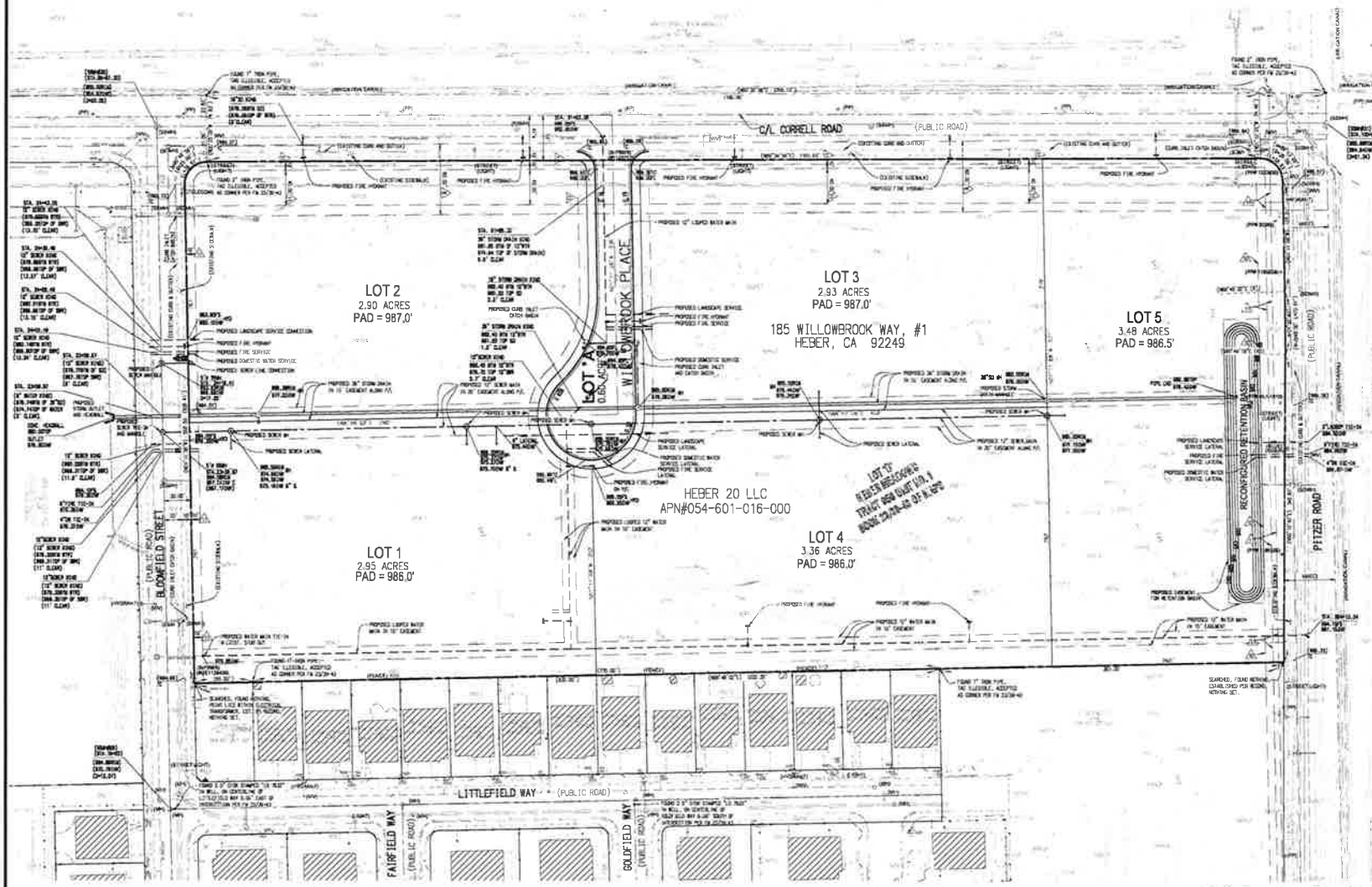
IN THE UNINCORPORATED TERRITORY OF HEBER, COUNTY OF IMPERIAL, STATE OF CALIFORNIA

TENTATIVE TRACT MAP NO. 00992

MIRALUZ

BEING LOT 5 OF HEBER MEADOWS TRACT 859 UNIT 1, AS SHOWN BY MAP FILED IN BOOK 32 OF MAPS, PAGE 39-43, RECORDS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, SAID LANDS BEING LOCATED IN A PORTION OF SECTION 20, TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN.

BENJAMIN DANIEL, EGAN, P.L.S. 8758 DATE OF SURVEY: SEPTEMBER 2019



OWNERSHIP/APPLICANT:

HEBER MEADOWS LAND HOLDINGS LLC
CARE OF DANIE DAVIS
6330 PASEO DEL LAGO
CARLSBAD, CA 92011

APN AND LEGAL DESCRIPTION:

REAL PROPERTY IN THE UNINCORPORATED AREA OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

LOT 5, OF HEBER MEADOWS TRACT 859 UNIT NO. 1, IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 32, PAGES 39 THROUGH 43 INCLUSIVE OF FINAL MAPS, RECORDS OF IMPERIAL COUNTY, CALIFORNIA.

EXCEPTING THEREFROM AN UNDIVIDED INTEREST AND NOT AS A RESERVATION, ONE HUNDRED PERCENT (100%) OF ALL OIL, GAS AND OTHER HYDROCARBONS, GEOTHERMAL RESOURCES AND DEFINED IN SECTION 6903 OF THE CALIFORNIA PUBLIC RESOURCES CODE AND ALL OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT, WITHIN OR THAT MAY BE PRODUCED FROM SAID REAL PROPERTY BELOW A DEPTH OF 500 FEET AND TO PRODUCE, INJECT, STORE AND REMOVE FROM OR THROUGH SUCH REAL OR WORKS, OIL, GAS AND OTHER SUBSTANCES OF WHATEVER NATURE, INCLUDING THE RIGHT TO PERFORM ANY AND ALL OPERATIONS DEEMED BY THE GRANTEE COMPANY NECESSARY OR CONVENIENT FOR THE EXERCISE OF SUCH MINERAL RIGHTS, PROVIDED, HOWEVER, THAT GRANTEE COMPANY AND ITS SUCCESSORS AND ASSIGNS SHALL NOT HAVE THE RIGHT TO ENTER UPON OR USE THE SURFACE OF THE REAL PROPERTY GRANTED HEREIN AND/OR TO BEN ABATTI, MARGARET L. ABATTI, TONY ABATTI AND MONA A ABATTI, AS RECORDED BY THE IRVINE COMPANY, A MICHIGAN CORPORATION ON 16 SOLD RECORDED JULY 28, 1980 AS INSTRUMENT NO 103 IN BOOK 1805, PAGE 1312 OF OFFICIAL RECORDS.

APN: 054-601-016-000

TITLE REPORT SCHEDULE B EXCEPTIONS:

1. GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2020-2021, A LIEN NOT YET DUE OR PAYABLE.
(THE ITEM IS NOT PLOTTABLE)
2. GENERAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2019-2020.
FIRST INSTALLMENT: $3 DUE BO, PAID
PENALTY $0 00
SECOND INSTALLMENT: $3 DUE BO, OPEN
PENALTY $0 00
TAX RATE AREA 086002
A. P. NO. 054-601-016-000
(THE ITEM IS NOT PLOTTABLE)
3. ASSESSMENT LIENS, IF APPLICABLE, COLLECTED WITH THE GENERAL AND SPECIAL TAXES, INCLUDING BUT NOT LIMITED TO THOSE DISCLOSED BY THE NOTATION ON THE FOLLOWING ON THE TAX ROLL:
1619 BOND FOR CSA50 2016 NOT SO IN LNT.
1915 BOND FOR CSA50 2016 SCR 2019 BO
1915 BOND FOR HEBER ELEM 1991 1999
1915 BOND FOR HEBER ESD MAY 2015.
1915 BOND FOR IMP ION COLLEGE BD 2004
(THE ITEM IS NOT PLOTTABLE)
4. THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO CHAPTER 3.5 COMMENCING WITH SECTION 75 OF THE CALIFORNIA REVENUE AND TAXATION CODE.
(THE ITEM IS NOT PLOTTABLE)
5. UNDER RESTRICTIONS AS CONTAINED IN DEED, RECORDED IN BOOK 328, PAGE 31 OF DEEDS RECORDS OF SAN DIEGO. (THE ITEM IS NOT PLOTTABLE)
6. AN EASEMENT FOR CONSTRUCTION, MAINTENANCE AND/OR USE OF A CANAL, TELEPHONE AND/OR ELECTRIC POWER LINE OR LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 25, 1944 AS BOOK 672, PAGE 201 OF OFFICIAL RECORDS.
IN FAVOR OF: IMPERIAL IRRIGATION DISTRICT
AFFECTS: AS DESCRIBED THEREIN
THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.
7. THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "AGREEMENT REGARDING AN OUTLET FOR WASTE WATER" RECORDED NOV 10, 1950 AS INSTRUMENT NO. 8 IN BOOK 808, PAGE 1 OF OFFICIAL RECORDS. (THE ITEM IS NOT PLOTTABLE)
8. AN EASEMENT FOR CANAL, TELEPHONE AND/OR ELECTRIC POWER LINE OR LINES AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 27, 1958 AS INSTRUMENT NO. 8 IN BOOK 1016, PAGE 085 OF OFFICIAL RECORDS
IN FAVOR OF: IMPERIAL IRRIGATION DISTRICT
AFFECTS: AS DESCRIBED THEREIN
(PLOTTED HEREON)
9. AN EASEMENT FOR TRANSPORTATION OF THE WATER IN A DITCH OR PIPE LINE AND INCIDENTAL PURPOSES, RECORDED DECEMBER 31, 1962 AS INSTRUMENT NO. 68 IN BOOK 1186, PAGE 447 OF OFFICIAL RECORDS.
IN FAVOR OF: HARRY E. KISER
AFFECTS: AS DESCRIBED THEREIN
(THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.)
10. SUCH RIGHTS AS THE CALIFORNIA DEVELOPMENT COMPANY, NOW KNOWN AS THE IMPERIAL IRRIGATION DISTRICT, MAY HAVE ACQUIRED FOR RIGHT OF WAY UNDER THE ACT OF MARCH 3, 1891 (26 STAT. 1101) AS USE 959(b)-980, BY THE FILING AND APPROVAL OF MAPS OF DEFINITE LOCATION IN THE DISTRICT LAND OFFICE, PRIOR TO THE DISPOSITION OF SAID LAND BY THE UNITED STATES OF AMERICA, LYING WITHIN THE EASERS OF:
CENTRAL 2-0 2MLN
DIRTIDO CANAL
CENTRAL 2-0 AD. 1
(PLOTTED HEREON)
11. AN EASEMENT SHOWN OR DEDICATED ON THE MAP AS REFERRED TO IN THE LEGAL DESCRIPTION FOR DRAINAGE, PUBLIC UTILITY AND POWER LINE AND INCIDENTAL PURPOSES
(PLOTTED HEREON)
12. THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "MEMORANDUM OF CONTINUING DISCLOSURE AGREEMENT" RECORDED DECEMBER 05, 2019 AS INSTRUMENT NO. 019-49008 OF OFFICIAL RECORDS.
(THE ITEM IS NOT PLOTTABLE)
13. AN OPTION IN FAVOR OF SAGE BEN INVESTMENT CORPORATION, A CALIFORNIA CORPORATION AS CONTAINED IN AN AGREEMENT BY A DOCUMENT RECORDED SEPTEMBER 27, 2019 AS INSTRUMENT NO. 2019019880 OF OFFICIAL RECORDS
(THE ITEM IS NOT PLOTTABLE)
14. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS
(THE ITEM IS NOT PLOTTABLE)
15. RIGHTS OF PARTIES IN POSSESSION
(THE ITEM IS NOT PLOTTABLE)

PRIOR TO THE ISSUANCE OF ANY POLICY OF TITLE INSURANCE, THE COMPANY WILL REQUIRE:
16. ITEM 16 REFERS TO TITLE COMPANY REQUIREMENTS WITH RESPECT TO PROVISIONS EVIDENCE OF EXISTING AUTHORITY FOR HEBER 20, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY.

DATUM STATEMENT:

COORDINATES AS SHOWN HEREON ARE IN TERMS OF THE CALIFORNIA COORDINATE SYSTEM (CCS83), 2006, (EPOCH 2017.50), BASED LOCALLY UPON THE FOLLOWING CONTINUOUS GPS CONTROL STATIONS AS PUBLISHED BY SCRIPPS ORBIT AND PERMANENT ARRAY CENTER (SOPAC) AND THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC):

P466 N 1,863,307.442 E 6,782,788.184
P344 N 1,880,167.743 E 6,788,478.915

COORDINATES SHOWN HEREON ARE EXPRESSED IN TERMS OF THE US SURVEY FOOT
DISTANCES SHOWN HEREON ARE GROUND UNLESS NOTED OTHERWISE.
TO CONVERT GRID MEASURE DISTANCES TO GROUND DISTANCES, DIVIDE GRID DISTANCE BY 1.000012663 COMBINED FACTOR TO OBTAIN GROUND DISTANCE.
CALCULATIONS FROM GRID TO GROUND VALUES AND CONVERGENCE ANGLE FOR THIS SURVEY WERE MADE AT COORDINATES OF N 1,849,088.318, E 6,788,880.558, USING AN ELEVATION OF -13.778 FT(NAVD88).

RECORD DATA:

() DENOTES RECORD DATA PER MAP FILED IN BOOK 32, PAGES 39 TO 43 OF FINAL MAPS

MONUMENT NOTES:

● DENOTES FOUND MONUMENT PER MAP FILED IN BOOK 32, PAGES 39 TO 43 OF FINAL MAPS

FLOOD ZONE:

THE SUBJECT PROPERTY IS DEPICTED ON FEDERAL EMERGENCY MANAGEMENT AGENCY, NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP NUMBER 06025C, EFFECTIVE SEPTEMBER 26, 2008 AND IS LOCATED IN COMMUNITY NUMBER 060306 - "IMPERIAL COUNTY, UNINCORPORATED AREAS", MAP PANEL 3625 SUFFIX C. SAID MAP DEPICTS PROPERTY BEING LOCATED WITHIN "ZONE B" - "AREAS OF MINIMAL FLOOD HAZARD"

TITLE REPORT NOTE:

THE INFORMATION ON THIS SURVEY IS BASED SOLELY ON THE FOLLOWING PRELIMINARY TITLE COMMITMENT PREPARED BY FIRST AMERICAN TITLE COMPANY, ORDER NUMBER NHSC-6146607, DATED FEBRUARY 27, 2020. THIS REPORT IS THE SOLE BASIS FOR TAX MATTERS, EASEMENTS, LIENS, MORTGAGES AND OTHER MATTERS OF PUBLIC RECORD SHOWN ON THIS SURVEY. THE SURVEYOR ASSUMES NO LIABILITY FOR THE OMISSION OF MATTERS NOT DISCLOSED ON SAID PRELIMINARY TITLE REPORT.

TOPOGRAPHIC DATA:

THE FIELD SURVEY WAS COMPLETED BY EGAN CIVIL, INC. ON SEPTEMBER 2, 2020 AND IS AUGMENTED WITH AERIAL PHOTOGRAMMETRY PROVIDED BY INLAND AERIAL SURVEYS UTILIZING CONTROL PROVIDED BY EGAN CIVIL, INC. THE DATE OF THE AERIAL FLIGHT IS 9/9/2020

PROJECT DESCRIPTION

SUBDIVIDE EXISTING 15.22 ACRE PARCEL INTO (5) PARCELS WITH LETTERED LOT FOR ACCESS FOR FUTURE DEVELOPMENT.

ZONING:

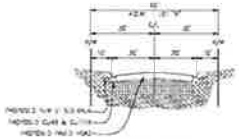
LOCATED IN IMPERIAL COUNTY (ZONE MAP 72) - TERRITORY OF HEBER
ZONING CLASSIFICATION: S3 - MEDIUM-HIGH DENSITY RESIDENTIAL ZONE

GENERAL PLAN DESIGNATION:

LAND USE: URBAN AREA
DESIGNATED WITHIN HEBER URBAN AREA SPECIFIC PLAN

SPECIFIC PLAN:

LOCATED IN HEBER TERRITORY
HEBER URBAN AREA PLAN
DESIGNATED AS HIGH DENSITY RESIDENTIAL DEVELOPMENT AREA



TYPICAL SECTION
WILLOWBROOK PLACE

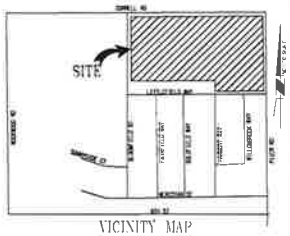
AREA TABULATION:

THE SUBJECT PROPERTY GROSS LAND AREA IS 15.22 ACRES.
(TOTAL 662 SQ. FT.) MORE OR LESS.

TABULATION OF PROPOSED LOT AREA'S

IDENTITY	AREA (ACRES)	AREA (SQUARE FEET)
PARCEL 1	2.95	128,570
PARCEL 2	2.90	125,848
PARCEL 3	2.96	128,627
PARCEL 4	3.22	140,278
PARCEL 5	3.49	151,457
LOT "A"	0.66	24,309
TOTAL	15.22	658,332

PREPARED BY:
EGAN CIVIL, INC.
BENJAMIN DANIEL EGAN, PE, PLS
42965 RIDGE STREET, SUITE A
INDIO CA 92201
(760) 604-7683
BEGANDANIEL@YL.COM



DIG ALERT
TOLL FREE 800-227-2600

SYMBOL LEGEND:

ABBREVIATIONS:

IP	IRON PIPE	SDMH	STORM DRAIN MANHOLE
MB	MAP BOOK	SMH	SAN. SEWER MANHOLE
MON	MONUMENT	TC	TOP OF CURB
N	NORTH	TOL	TOP OF LEDGE
NTS	NOT TO SCALE	TW	TOP OF WALL
PL	PROPERTY LINE	W	WEST
R/W	RIGHT-OF-WAY	W.F.	WIRE FENCE
RS	RECORD OF SURVEY	WM	WATER METER
PMB	PARCEL MAP BOOK	WV	WATER VALVE
S	SOUTH	(UNK.EL)	UNDERGROUND ELEVATION UNKNOWN
SEC	SECTION		

EGAN CIVIL, INC.

PREPARED UNDER THE DIRECT SUPERVISION OF:

BENJAMIN DANIEL EGAN, P.L.S. 8758

DATE

HEBER MEADOWS LAND HOLDINGS LLC
6330 PASEO DEL LAGO
CARLSBAD CA 92011
CARE OF: DANIE DAVIS
760-814-6299 EXT 102

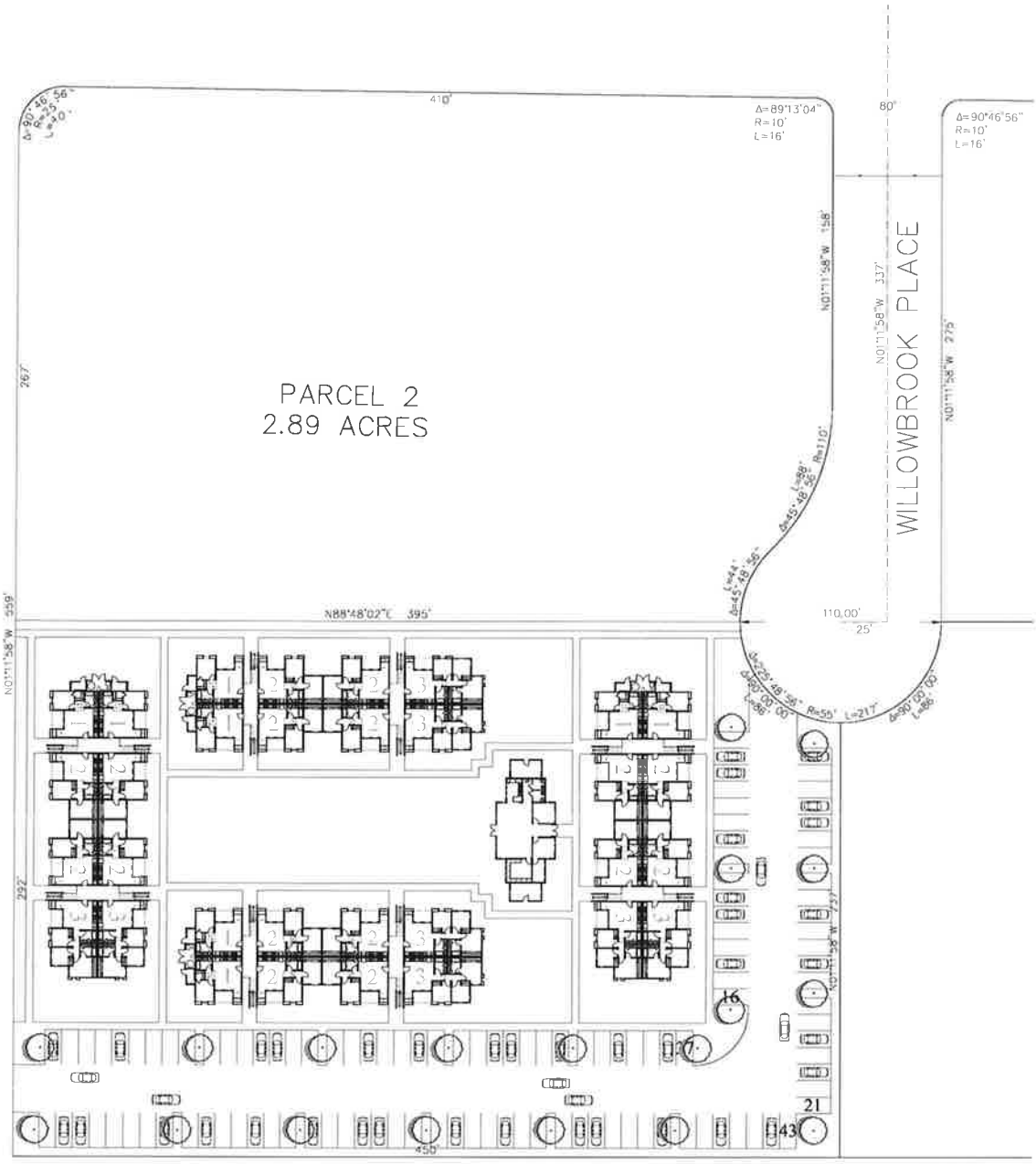
UNINCORPORATED TERRITORY, COUNTY OF IMPERIAL, STATE OF CALIFORNIA
185 WILLOWBROOK WAY #1
HEBER, CA 92249

TENTATIVE TRACT MAP 00992
MIRALUZ
VILLAGE LAND
CHELSEA DEVELOPMENT

SHEET 1 OF 1 SHEETS

20190367

EXHIBIT PRINTED 06/23/2021



SITE PLAN

BUILDING DATA

16	1BR/1BA	583 SQ. FT
32	2BR/1BA	742 SQ. FT
16	3BR/2BA	938 SQ. FT

64 TOTAL UNITS

COMMUNITY BUILDING
WITH LAUNDRY RM
1,960 SQ. FT.

PARKING DATA

16/1BR X 1.4 = 22.8 PARKING SPACES
32/2BR X 1.4 = 44.8 PARKING SPACES
16/3BR X 1.4 = 22.4 PARKING SPACES

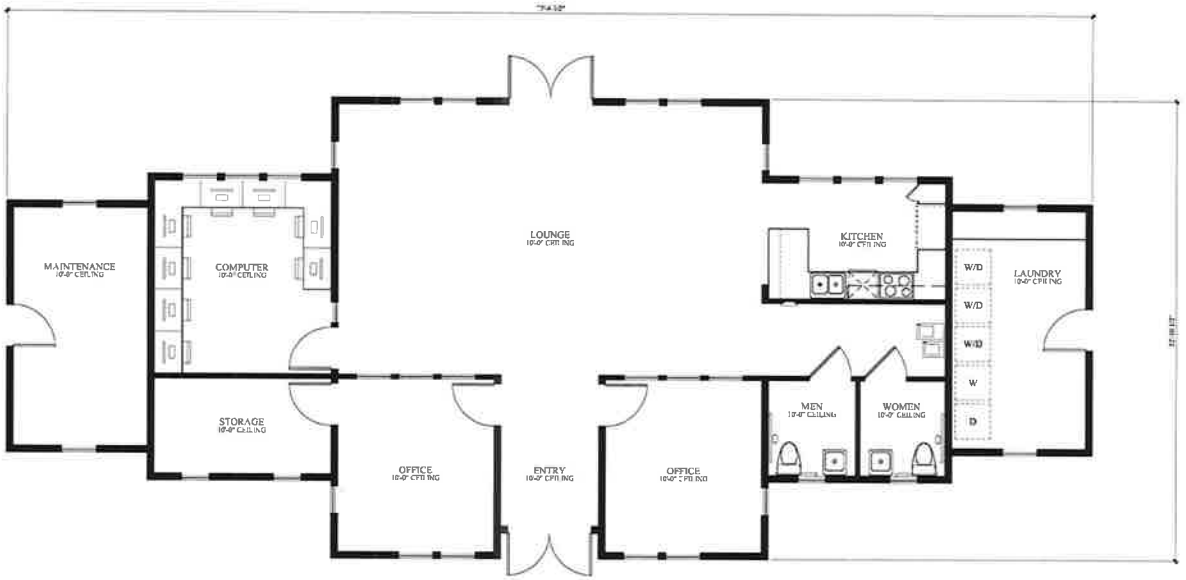
90.4 REQUIRED PARKING SPACES
117 PROVIDED PARKING SPACES

HEBER MEADOWS

CHELSEA INVESTMENT CORPORATION

THE McKINLEY ASSOC., INC
ARCHITECTURE & PLANNING

MARCH 24, 2021



COMMUNITY BUILDING
SCALE: 1/4" = 1'-0"

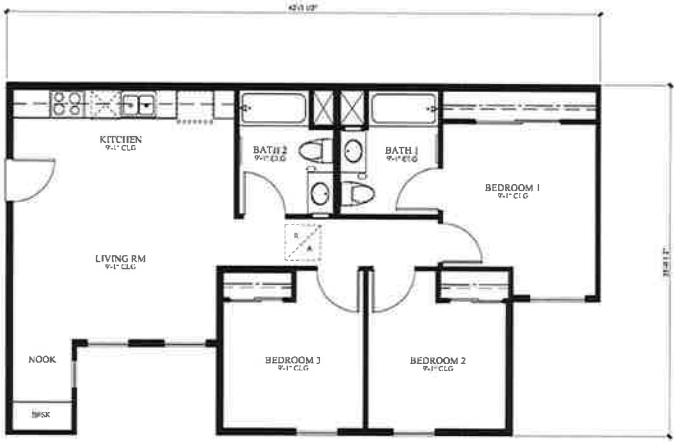
COMMUNITY BUILDING: 1,800 SQ. FT.
LAUNDRY 180 SQ. FT.
MAINTENANCE 180 SQ. FT.
TOTAL: 1,960 SQ. FT.

HEBER MEADOWS
COMMUNITY BUILDING
CHELSEA INVESTMENT CORPORATION

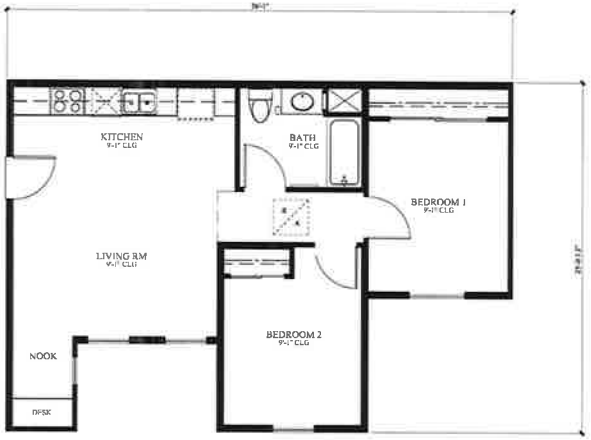
SCALE: 1/4" = 1'-0"

THE McKINLEY ASSOC., INC.
ARCHITECTURE & PLANNING

SEPTEMBER 21, 2020



THREE BEDROOM UNIT
SCALE: 1/4" = 1'-0" 938 SQ. FT.



TWO BEDROOM UNIT
SCALE: 1/4" = 1'-0" 742 SQ. FT.

ONE BEDROOM UNIT
SCALE: 1/4" = 1'-0" 583 SQ. FT.

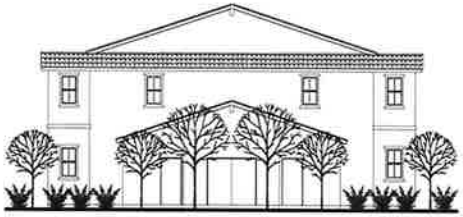
HEBER MEADOWS
UNIT PLANS
CHELSEA INVESTMENT CORPORATION

SCALE: 1/4" = 1'-0"

THE McKINLEY ASSOC., INC
ARCHITECTURE & PLANNING

JANUARY 27, 2020

FRONT ELEVATION



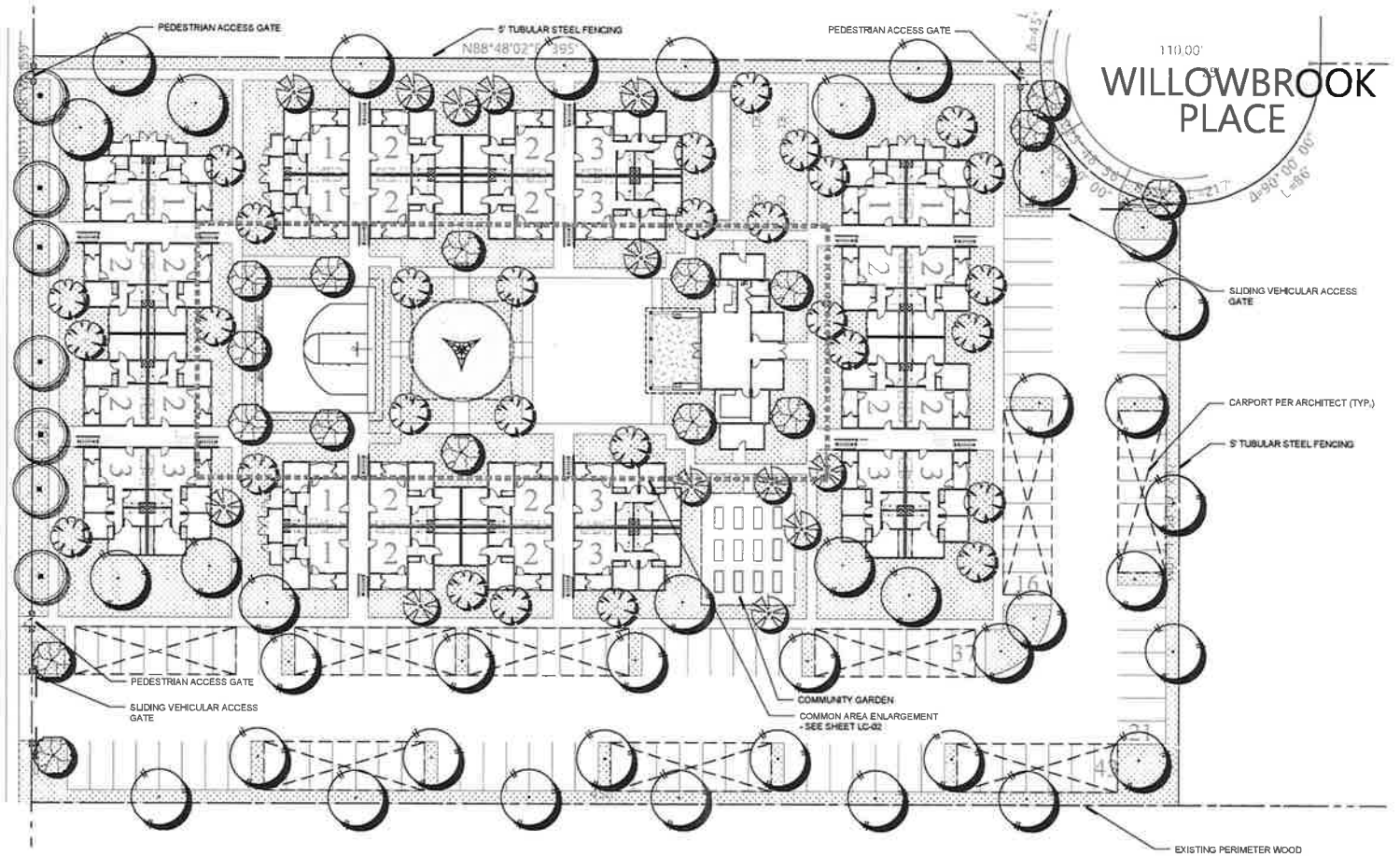
LEFT ELEVATION

RIGHT ELEVATION

HEBER MEADOWS
EXTERIOR ELEVATIONS
CHELSEA INVESTMENT CORPORATION

THE McKINLEY ASSOC. INC
ARCHITECTURE & PLANNING

JANUARY 27, 2020



DESIGN OBJECTIVES:

1. PLANTING WILL BE DESIGNED TO OBSCURE UNDESIRABLE VIEWS (AUTOMOBILES, STORAGE, UTILITY AREAS, ETC.) AND ADD CHARACTER AND INTEREST TO THE PROJECT.
2. ARCHITECTURAL ELEMENTS OF THE SITE WILL BE RELATED AND ENHANCED WITH PLANTING OF SIMILAR DESIGN CHARACTER.
3. ALL PLANT MATERIAL SELECTED FOR USE WILL BE OF A TYPE KNOWN TO BE SUCCESSFUL IN THE AREA OR IN SIMILAR CLIMATIC AND SOIL CONDITIONS.
4. COLOR FROM PLANT FOLIAGE, BARK OR FLOWERS WILL BE UTILIZED TO CREATE A FRIENDLY, WARM AND VISUALLY EXCITING LANDSCAPE ENVIRONMENT. THEMATIC COLOR SCHEMES WILL BE UTILIZED IN DEVELOPING PROJECT IDENTITY.
5. ALL OUTDOOR STORAGE, LOADING, REFUSE AND UTILITY AREAS WILL BE VISUALLY SCREENED ON ALL SIDES (EXCEPT AT ACCESS POINTS). PLANTING WILL BE USED TO SOFTEN HARD MATERIALS WHERE SUCH ARE USED FOR SCREENING.
6. VEHICULAR ENTRANCES WILL BE IDENTIFIED AND ACCENTED WITH SPECIAL GROUPINGS OF TREES, SHRUBS AND/OR GROUNDCOVERS.
7. SLOPE PLANTINGS, HYDROSEEDING AND MULCHING PROCESSES ARE INTENDED TO TAKE PLACE DURING THE APPROPRIATE SEASONS OF LATE FALL OR WINTER (NOVEMBER THROUGH FEBRUARY) FOR OPTIMUM RESULTS.
8. LANDSCAPE FINISH GRADING OBJECTIVES WILL INCLUDE POSITIVE SURFACE DRAINAGE OF PLANTED AREAS THROUGHOUT THE SITE.
9. IRRIGATION SYSTEMS WILL BE PERMANENT BELOW GROUND AUTOMATED SYSTEMS, WHERE ALLOWED, FOR THE ESTABLISHMENT AND MAINTENANCE OF ALL PLANT MATERIAL. THESE SYSTEMS WILL BE INSTALLED AS SOON AS PRACTICAL AFTER GRADING AND PRIOR TO PLANT MATERIAL INSTALLATION AND HYDROSEEDING. THE IRRIGATION SYSTEM SHALL CONSIST OF LOW PRECIPITATION RATE SPRAY HEADS FOR GROUND COVER AND SHRUB PLANTER AREAS. ALL SLOPES SHALL BE IRRIGATED WITH SPRAY AND ROTOR HEADS. MICRO SPRAY HEADS MAY BE USED WHERE REASONABLE.
10. ALL SOILS WILL BE FERTILIZED, AMENDED, AND TILLED TO CONFORM TO RECOMMENDATIONS MADE BY A SOIL TESTING LABORATORY AND/OR LANDSCAPE ARCHITECT IN ORDER TO PROMOTE HEALTHY AND VIGOROUS PLANT GROWTH.
11. ALL PLANTING AREAS WILL BE MAINTAINED IN A WEED AND DEBRIS FREE CONDITION.

NOTES:

COVERED PARKING - 1 COVERED SPACE / UNIT, 94 COVERED SPACES IN TOTAL ON SITE.

IRRIGATION: AN AUTOMATIC, ELECTRICALLY CONTROLLED IRRIGATION SYSTEM SHALL BE PROVIDED FOR PROPER IRRIGATION, DEVELOPMENT, AND MAINTENANCE OF THE VEGETATION IN A HEALTHY, DISEASE-RESISTANT CONDITION. THE DESIGN OF THE SYSTEM SHALL PROVIDE ADEQUATE SUPPORT FOR THE VEGETATION SELECTED.

MAINTENANCE: ALL LANDSCAPE AND IRRIGATION AREAS IN THE PUBLIC R.O.W. AND REMAINING ON SITE LANDSCAPE SHALL BE PRIVATELY MAINTAINED BY OWNER. THE LANDSCAPE AREAS SHALL BE MAINTAINED FREE OF DEBRIS AND LITTER AND ALL PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION. DISEASED OR DEAD PLANT MATERIAL SHALL BE SATISFACTORILY TREATED OR REPLACED PER THE CONDITIONS OF THE PERMIT.

NOTES CONT.

ALL PROJECT PLANT MATERIAL PROVIDED FOR USE ON THE SITE SHALL MEET THE REQUIREMENTS SET FORTH IN THE IMPERIAL COUNTY AGRICULTURE COMMISSIONER'S LETTER DATED DEC. 7, 2020 (SEE SHEET LC-02).

SCALE: 1"=20'-0"

Underground Service Alert Call 811

LANDSCAPE ARCHITECTURE & PLANNING

SHEET TITLE: LANDSCAPE CONCEPT PLAN

PROJECT/CLIENT: HEBER MEADOWS PHASE 1
HEBER, CA
CHELSEA INVESTMENT CORP
6339 Paseo del Lago
Carlsbad, CA 92011

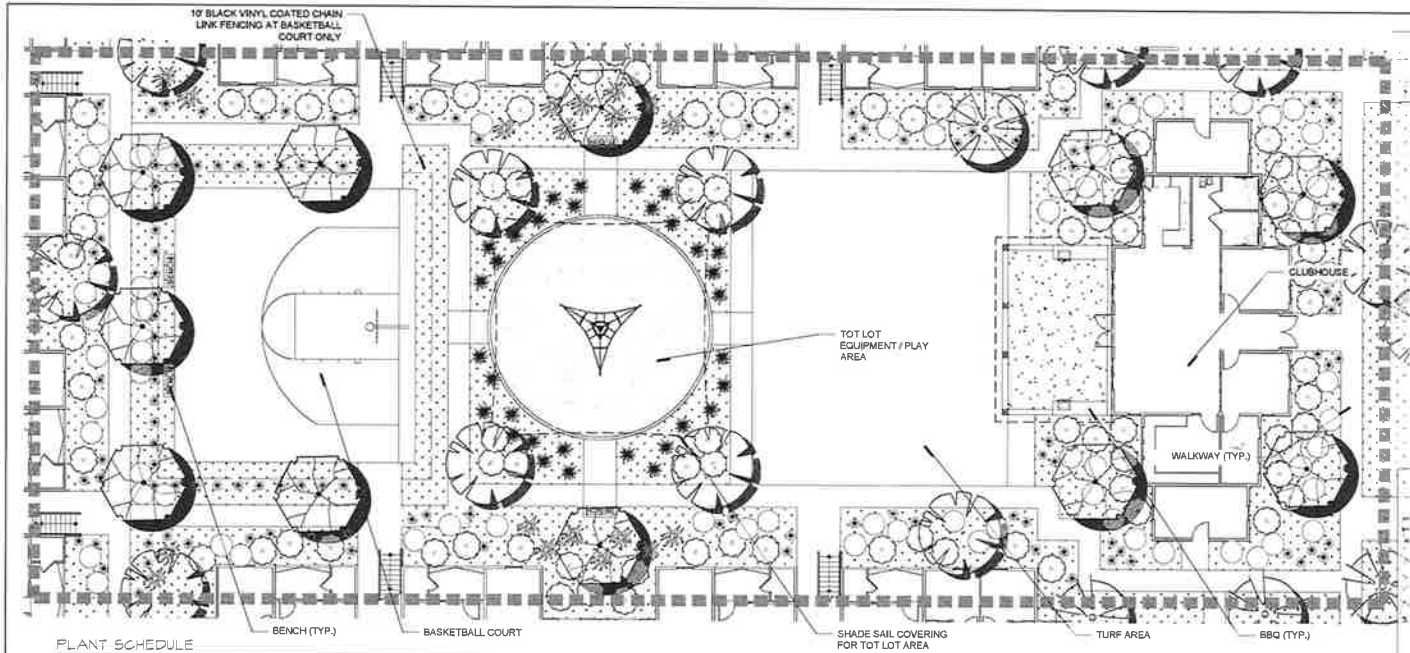
REVISIONS
1ST SUBMITTAL 10-29-20
RESUBMITTAL 03-03-21

DRAWN: CCJR
APPROVED: JJ
PLOT DATE: 03/03/2021
JOB NO.: 20-042
SCALE: SEE SHEET

LC-01

SHEET 01 OF 02

FILE NAME: G:\20-PROJECTS\20-042-20L AK\ARC\ADV\CE-PT\20-042 HEBER MEADOWS CONCEPT.DWG



PLANT SCHEDULE

TREES

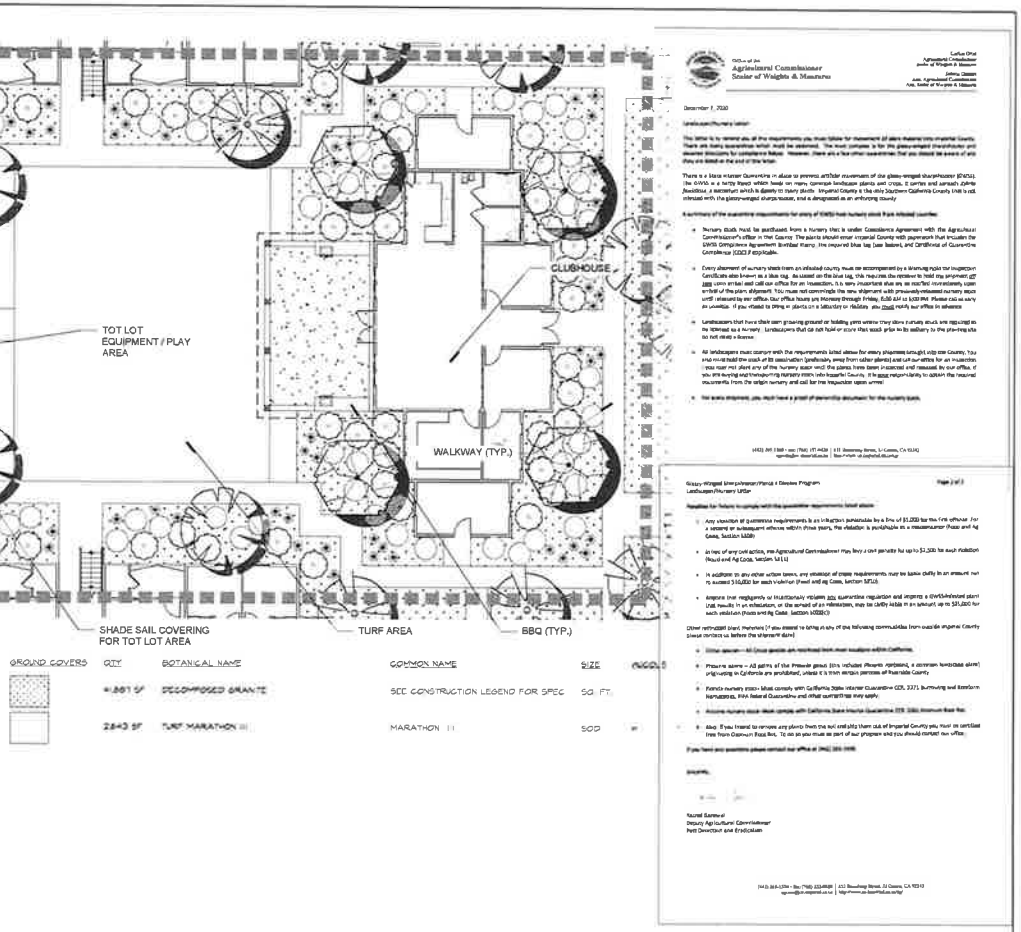
BOTANICAL NAME	COMMON NAME	SIZE	H2O/LS
ACACIA STENOPHYLLA	SHOESTRING ACACIA	24" BOX	L
CERCIDIUM X 'DESERT MUSEUM'	THORNLESS PALO VERDE	24" BOX	L
CHILOPSIS L. 'TIMELESS BEAUTY'	DESERT WILLOW	24" BOX	M
DALBERGIA SISSOO	INDIAN ROSEWOOD	24" BOX	L
RHUS LANCEA	AFRICAN SUMAC MULTI-TRUNK	24" BOX	M

SHRUBS

BOTANICAL NAME	COMMON NAME	SIZE	H2O/LS
ACACIA REDOLENS	PROSTRATE ACACIA	5 GAL	L
BOUGAINVILLEA X 'LA JOLLA'	BOUGAINVILLEA	5 GAL	L
CAESALPINIA MEXICANA	MEXICAN BIRD OF PARADISE	5 GAL	L
CALLIANDRA CALIFORNICA	RED BAJA FAIRY DUSTER	5 GAL	L
CARISSA GRANDIFLORA	NATAL PLUM	5 GAL	M
DASYLIRION WHEELERI	GREY DESERT SPOON	5 GAL	L
HESPERALOE PARVIFLORA	RED YUCCA	5 GAL	L
LEUCOPHYLLUM G. 'THUNDER CLOUD'	THUNDER CLOUD TEXAS SAGE	5 GAL	L
LEUCOPHYLLUM FRUTESCENS 'GREEN CLOUD' TM	GREEN CLOUD TEXAS RANGER	5 GAL	L
NERIUM OLEANDER 'PETITE PINK'	PETITE PINK OLEANDER	5 GAL	M
PENNISETUM SETACEUM 'RUBRUM'	PURPLE FOUNTAIN GRASS	5 GAL	L
SIMMONDSIA CHINENSIS	JOJOBA	5 GAL	L
TACOMA STANS	YELLOW BELLS	5 GAL	M

GROUND COVERS

QTY	BOTANICAL NAME	COMMON NAME	SIZE	H2O/LS
41,861 SF	DECOMPOSED GRANITE	SEE CONSTRUCTION LEGEND FOR SPEC	SQ. FT.	
2843 SF	TURF MARATHON II	MARATHON II	SOD	M



Office of the
Agricultural Commissioner
Sealer of Weights & Measures

December 7, 2020

Landscape/Nursery Letter

This letter is to remind you of the requirements you must follow for movement of plant material into Imperial County. There are many quarantines which must be observed. The most complex is for the glassy-winged sharpshooter (GWSS) the GWSS is a pesty insect which feeds on many common landscape plants and crops. It carries and spreads xylella fastidiosa, a bacterium which is deadly to many plants. Imperial County is the only Southern California County that is not infested with the glassy-winged sharpshooter, and is designated as an enforcing county.

A summary of the quarantine requirements for plants of GWSS host nursery stock from infested counties:

- Nursery stock must be purchased from a nursery that is under Compliance Agreement with the Agricultural Commissioner's office in that County. The plants should arrive Imperial County with paperwork that includes the GWSS Compliance Agreement Number thereof. The imported blue tag (see below), and Certificate of Quarantine Compliance (COC) if applicable.
- Every shipment of nursery stock from an infested county must be accompanied by a biennial agricultural inspection. Certificates also known as a blue tag. As issued on the blue tag, this requires the receiver to hold any shipment off sale upon arrival and call our office for an inspection. It is very important that we be notified immediately upon on-hold of the plant shipment. You must not commingle the new shipment with previously released nursery stock until released by our office. Our office hours are Monday through Friday, 8:00 AM to 5:00 PM. Please call as early as possible. If you intend to ship in plants on a Saturday or Holiday you must notify our office in advance.
- Landscapers that have their own growing ground or holding yard where they store nursery stock are required to be licensed as a nursery. Landscapers that do not hold or store their stock prior to its delivery to the planting site do not need a license.
- All landscapers must comply with the requirements listed above for every shipment brought into the County. You are required the stock of its destination (professor, away from other plants) and call our office for an inspection. You must not plant any of the nursery stock until the plants have been inspected and released by our office. If you are buying and transporting nursery stock into Imperial County, it is your responsibility to obtain the required documents from the origin nursery and call for the inspection upon arrival.
- For every shipment, you must have a proof of ownership document for the nursery stock.

(442) 265-1500 • Fax (760) 337-4456 | 115 Broadway Street, El Centro, CA 92243
agcomm@imperialcounty.net | http://www.co.imperial.ca.us

Glassy-Winged Sharpshooter/Pierce's Disease Program
Landscape/Nursery Letter

Page 2 of 2

Penalties for failure to comply with the quarantine requirements listed above:

- Any violation of quarantine requirements is an infraction punishable by a fine of $1,000 for the first offense. For a second or subsequent offense within three years, the violation is punishable as a misdemeanor (Food and Ag Code, Section 5301)
- In lieu of any civil action, the Agricultural Commissioner may levy a civil penalty for up to $1,200 for each violation (Food and Ag Code, Section 5311)
- In addition to any other action taken, any violation of these requirements may be taken civilly in an amount not to exceed $10,000 for each violation (Food and Ag Code, Section 5751).
- Anyone that negligently or intentionally violates any quarantine regulation and imports a GWSS-infested plant that results in an infestation, or the spread of an infestation, may be civilly liable in an amount up to $25,000 for each violation (Food and Ag Code, Section 5302(c))

Other restricted plant materials (* also applies to bring in any of the following commodities from outside Imperial County please contact us before the shipment date):

- Citrus species – All Citrus species are restricted from most locations within California.
- Prunus species – All species of the Prunus genus (this includes Prunus armeniaca, a common landscape plant) originating in California are prohibited, unless it is from certain portions of Riverside County.
- Ficaria nursery stock- Must comply with California State Interior Quarantine (CIS, 3271, Burrowing and Reinforce Nematodes, PPA Federal Quarantine and other quarantine may apply.
- Arizona nursery stock- Must comply with California State Interior Quarantine (CIS, 3271, Burrowing and Reinforce Nematodes, PPA Federal Quarantine and other quarantine may apply.
- Also, if you intend to remove any plants from the soil and ship them out of Imperial County you must be certified free from Oleander Root Rot. To do so you must be part of our program and you should contact our office.

If you have any questions please contact our office at (442) 265-1500.

Sincerely,

Yousef Sammut
Deputy Agricultural Commissioner
Pest Detection and Eradication

(442) 265-1500 • Fax (760) 337-4456 | 115 Broadway Street, El Centro, CA 92243
agcomm@imperialcounty.net | http://www.co.imperial.ca.us/ag/

10 5 0 10 20 30
SCALE: 1"=10'-0"

Underground Service Alert
Call 811
TWO WORKING DAYS BEFORE YOU DIG
"CAUTION" Remember that the USA Center notifies only those utilities belonging to the center. There are other companies and agencies that may have underground facilities in the area. You may contact each of them directly or call 811.

gmp
LANDSCAPE ARCHITECTURE & PLANNING

CERTIFIED LANDSCAPE IRRIGATION AUDITOR
STATE OF CALIFORNIA

SHEET TITLE
LANDSCAPE CONCEPT PLAN

PROJECT/CLIENT:
HEBER MEADOWS PHASE 1
HEBER, CA
CHELSEA INVESTMENT CORP
6339 Paseo del Lago
Carlsbad, CA 92011

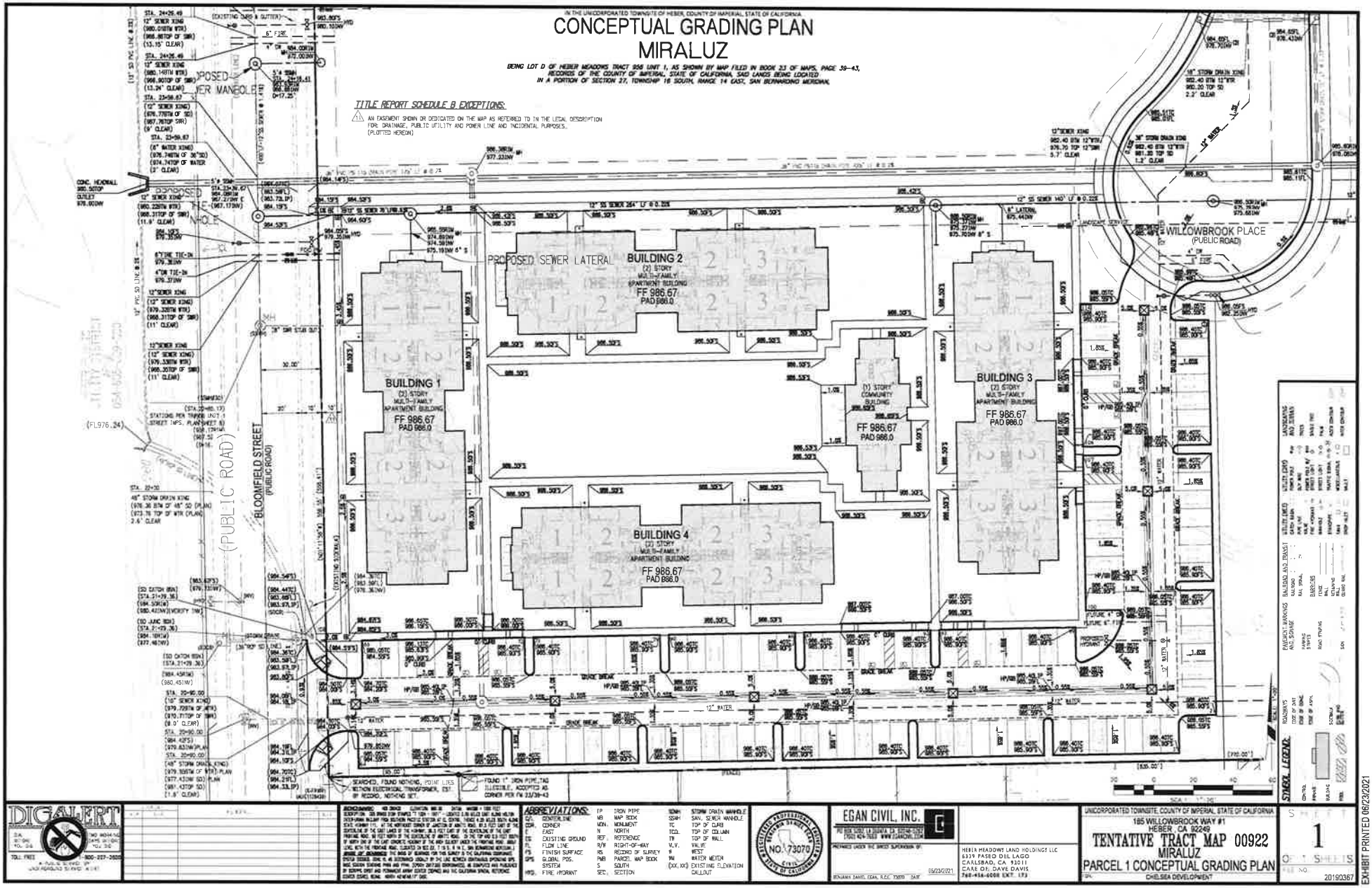
REVISIONS
1ST SUBMITTAL 10-30-20
RESUBMITTAL 03-03-21

DRAWN CDUP
APPROVED BJ
PLOT DATE 03/03/2021
JOB NO. 20-042
SCALE 1/8" SHEET

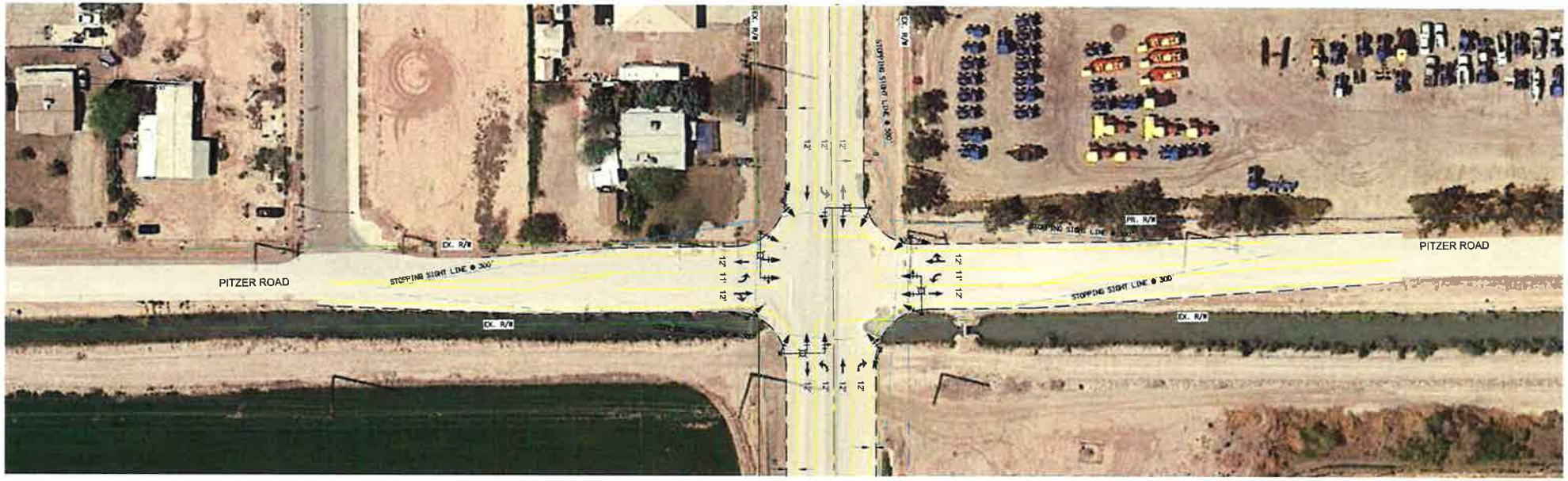
LC-02

SHEET 02 OF 02

FILE NAME: G:\20-PROJECTS\20-042-DNL ANDARCH\CONCEPT\20-042 HEBER MEADOWS CONCEPT.DWG


IN THE UNINCORPORATED TOWNSITE OF HEBER, COUNTY OF IMPERIAL, STATE OF CALIFORNIA
CONCEPTUAL GRADING PLAN
MIRALUZ
BEING LOT D OF HEBER MEADOWS TRACT 956 UNIT 1, AS SHOWN BY MAP FILED IN BOOK 23 OF MAPS, PAGE 39-43, RECORDS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, SAID LANDS BEING LOCATED IN A PORTION OF SECTION 27, TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN.
TITLE REPORT SCHEDULE B EXCEPTIONS:
1. AN EASEMENT SHOWN OR DEDICATED ON THE MAP AS REFERRED TO IN THE LEGAL DESCRIPTION FOR DRAINAGE, PUBLIC UTILITY AND POWER LINE AND INCIDENTAL PURPOSES. (PLOTTED HEREON)
BUILDING 1
(2) STORY MULTI-FAMILY APARTMENT BUILDING
FF 986.67
PAD 986.0
BUILDING 2
(2) STORY MULTI-FAMILY APARTMENT BUILDING
FF 986.67
PAD 986.0
BUILDING 3
(2) STORY MULTI-FAMILY APARTMENT BUILDING
FF 986.67
PAD 986.0
BUILDING 4
(2) STORY MULTI-FAMILY APARTMENT BUILDING
FF 986.67
PAD 986.0
(1) STORY COMMUNITY BUILDING
FF 986.67
PAD 986.0
PROPOSED SEWER LATERAL
WILLOWBROOK PLACE
(PUBLIC ROAD)
BLOOMFIELD STREET
(PUBLIC ROAD)
(PUBLIC ROAD)
SHEET LEGEND
ROADWAYS
DRIVEWAYS AND SIDEWALKS
PARKING STRIPING
RAMP TYPE/NO.
BARRICADES
CONTROL
STORM DRAIN
SEWER
WATER
LANDSCAPING AND SCREENS
UTILITY BOXES
SIGNS
ABBREVIATIONS:
CL CENTERLINE
COR. CORNER
E EAST
EG EXISTING GROUND
FL FLOW LINE
FS FINISH SURFACE
GPS GLOBAL POS. SYSTEM
HYD. FIRE HYDRANT
IP IRON PIPE
MB MAP BOOK
MON. MONUMENT
N NORTH
REF. REFERENCE
R/W RIGHT-OF-WAY
RS RECORD OF SURVEY
PMB PARCEL MAP BOOK
S SOUTH
SEC. SECTION
SDMH STORM DRAIN MANHOLE
SSMH SAN. SEWER MANHOLE
TC TOP OF CURB
TCOL TOP OF COLUMN
TW TOP OF WALL
V.V. VALVE
W WEST
WM WATER METER
(XX', XX') EXISTING ELEVATION CALLOUT
NO. 73070
EGAN CIVIL, INC.
HEBER MEADOWS LAND HOLDINGS LLC
6339 PASEO DEL LAGO
CARLSBAD, CA 92011
CARE OF: DAVE DAVIS
760-456-6008 EXT. 173
UNINCORPORATED TOWNSITE, COUNTY OF IMPERIAL, STATE OF CALIFORNIA
185 WILLOWBROOK WAY #1
HEBER, CA 92249
TENTATIVE TRACT MAP 00922
MIRALUZ
PARCEL 1 CONCEPTUAL GRADING PLAN
CHELSEA DEVELOPMENT
SHEET 1
OF 1 SHEETS
FILE NO. 20190367
EXHIBIT PRINTED 06/23/2021

STATE ROUTE 86 / PITZER
SIGNALIZED INTERSECTION WIDENING
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT
DRAFT CONCEPT PLAN
FEBRUARY 15, 2021



30 15 0 30 60 90
SCALE: 1"=30'

STATE ROUTE 86 / PITZER
SIGNALIZED INTERSECTION WIDENING
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT
DRAFT CONCEPT PLAN
FEBRUARY 15, 2021

FINAL
Conditions of Approval
for
Heber Meadows Tract Map #956 Subdivision
(APNs: 054-170-38 & 52-01)
(Approved by Board of Supervisors on August 3, 2004)

The Developer shall comply with all of the CONDITIONS specified below, prior to the map or any portion or phase of the map being recorded, unless a specific condition herein is deferred, or unless the implementation of the condition's requirement is to be implemented at a later date and is secured with an acceptable surety. The term "Developer" shall mean the current owner (s), or any developer (current or future) or any assignee(s), etc.

General Conditions 1

(1) The Developer shall comply with all local, state and/or federal laws, rules, regulations and/or standards as they may pertain to this project, whether specified herein or not.

(2) The Developer shall pay any and all amounts as determined by the County of Imperial to defray all costs for the review of reports, field investigations, or other activities related to compliance with this project, County Ordinances, and/or any other laws that apply. No Tract Map shall record until all fees (costs) related to this map and the Mitigated Negative Declaration are paid in full.

(3) The Developer shall provide and dedicate to the County and other applicable agencies all necessary easements.

(4) All "off-site" improvement plans shall be reviewed and approved by the County of Imperial Department of Public Works in cooperation with the State of California Department of Transportation, and where applicable the Heber Public Utilities District, prior to any construction. The project shall be constructed to all County and State standards with the most restrictive condition applying.

(5) All interior road improvements shall meet required standards of the County of Imperial.

(6) All improvement plans including lot grading, infrastructure to be submitted to the County Department of Public Works for review and approval prior to construction. In performing the review, County standards shall govern.

(7) All parcels shall have premise identification numbers clearly posted on the curb and the residence, per Uniform Fire Code 1988, (or latest edition) Section 10.208(a). Premise numbers shall be at least six inches (6") in height and of contrasting color to the background or internally illuminated. The numbers will be assigned by Planning/Building Department; however, the Developer shall provide an autocaed digital (map) copy to the department showing all lot numbers.

(8) All plans, reports, and studies shall be reviewed and approved by the respective responsible agencies; prior to the Developer constructing or installing said improvements. All installation of said improvements shall be reviewed and inspected by the respective responsible agencies. Unless expressly deferred in these conditions all conditions are to be satisfied prior to recordation of the final map.

(9) All easements of record must be shown on the Final Tract Map.

(10) All solid and hazardous waste shall be disposed of in an approved solid waste disposal site in accordance with existing County, State, and Federal regulations.

(11) The Developer shall implement a watering plan to control dust and reduce fugitive dust during construction, and shall provide a dust mitigation plan to the Imperial County Air Pollution Control District for review and approval prior to the recordation of the Tract Map. A copy shall be on file with the Planning/Building Department.

(12) All improvements required for development shall be constructed, or in lieu thereof, security provided prior to recordation of the Tract Map, and shall be in conformance with the County of Imperial Ordinances.

(13) The Developer shall be responsible for, participate in, and commit necessary resources to assure that all infrastructure(s) necessary is installed in the sequence and at the time required in order to implement the Tract Map.

(14) A noise study/analysis has been done and shall be implemented, not to exceed exterior 70 CNEL and 55 CNEL interior dBA shall be installed through Planning/Building Department approved measures. A noise attenuation structure separating the project from adjacent residential and industrial areas shall be constructed shall be required to mitigate noise impacts from adjacent land uses.

(15) The Developer shall provide a landscaping plan to the County Planning/Building Department for review and approval prior to issuance of the first building permit.

(16) The Developer shall provide a full soils report for the site, including the addressing of seismic hazards and implement the design of all foundation systems according to the soil engineer's recommendation. Any and all construction shall meet the latest Uniform Codes and provide foundation roadbeds and other structures susceptible to expansive soils as recommended in the soils report.

(17) A fiscal impact analysis/study for the whole project (single family and multi-family) in all of its phases, shall be prepared prior to the recordation of the first Final Map for mitigating all of the impacts of the project on the current level of services, i.e. fire, sheriff, roads, water and sewer, street lighting, detention area, and park maintenance for the life of the project.

(18) An Assessment District shall be formed, pursuant to the Land Use Ordinance, Section 90806.26, et. seq., and said District shall pay the capital cost of the public improvement, the maintenance and operational expenses of the public improvements, or the cost of the service being provided, as identified within the fiscal impact analysis/study, prior to the sale of any parcel within the proposed project (pursuant to Government Code, Section 53750, (b)).

Environmental Evaluation Committee Specific Mitigation Measures:[2]

(19) On-Site/Infrastructure Improvements (Public Works Department). The Developer shall construct sidewalks along the project's frontage with Correll Road and Pitzer Road; street lighting shall be provided along the project's frontage with Correll and Pitzer road with the feasibility of providing a bus stop at the project site and having the local transit authority extend bus service into the project area shall be considered and investigated, and the Developer shall dedicate rights-of-way for bike lanes connecting to the local bike network.

(20) Burrowing Owl Survey (California Dept. of Fish and Game). The Developer shall do a pre-construction survey for burrowing owls within one month of the commencement of earth disturbance (grading or construction) on the project site; if the pre-construction survey determines that no burrowing owls are on the project site, all on-site burrows shall be caved prior to the commencement of earth disturbance; and if the survey determines that burrowing owls are on-site, adult owls shall be captured and relocated to an off-site reserve and other measures to mitigate potential impacts to the burrowing owl are available and can be negotiated with the California Department of Fish and Game as appropriate.

(21) Noise – (Planning/Building Department). The Developer shall construct a noise barrier of six feet measured vertically from the proposed pad elevation along backyard property lines of single-family lots adjacent to Pitzer Road; all of the recommended barriers shall wrap around side yards where they meet internal streets and drainages; barriers may be earthen berms, masonry, wood, plexiglass, glass or similar material or a combination of these materials and should be solid, with no openings from the ground to the indicated height; when grading plans and architectural plans become available, an indoor noise analysis shall be conducted for two-story single-family homes adjacent to or exposed to noise levels greater than 65 dB CNEL; proposed multiple-family homes shall either be situated at least 110 feet from the centerlines of Pitzer Road and Correll Road or be provided with air conditioning or mechanical devices providing fresh air so windows can remain closed to achieve an interior noise level of 45 dB CNEL; and, future homeowners shall receive notification regarding the potential noise impacts associated with nearby agricultural and other activities.

(22) Traffic - (Department of Public Works/CALTRANS). The Developer shall contribute a "fair share" towards the planned future signalization of the SR 86/I-8 westbound ramps intersection; the Developer shall contribute a fair share towards the planned future signalization of the SR 86/I-8 eastbound ramps intersection; the Developer shall contribute a fair share towards the future signalization of the Dogwood

Road/Chick Road/Danenberg Road intersection and provide dedicated left-turn pockets on each approach; the Developer shall contribute a fair share towards the signalization of the Dogwood Road/Correll Road Intersection and provide dedicated westbound left-turn and right-turn lanes on Correll Road and provide a dedicated southbound left-turn land on Dogwood Road; the Developer shall provide a bond or other surety for the construction of a traffic signal at the SR 86/Pitzer Road and a dedicated eastbound left-turn lane and a dedicated westbound right-turn lane for access onto and off of SR 86 when warrants are met; the Developer shall contribute a fair share towards the signalization and associated geometric improvements of the SR 111/Jasper Road intersection; the Developer shall provide a bond or other surety for the signalization of the future access points on both Correll Road and Pitzer Road when traffic signal warrants are met and signalization shall include dedicated left-turn pockets; the Developer shall ensure that driveways to the multi-family portion of the project shall be restricted to right-turn only in the future at the discretion of the County Public Works Director; and, the Developer shall contribute a "fair share" towards the provision of a second northbound left-turn lane and a dedicated eastbound right-turn lane at the SR 111/SR 86 intersection.

Traffic and Road Related Conditions:[3]

(23) The Developer shall agree to participate in the "Dogwood/McCabe Benefit Fee Area" which provides for road and park improvements within the Benefit Fee Area, which this development lies within.

(a) If the Tract Map records prior to the "Benefit Fee Area" being implemented, then the improvements shall be the Developer's responsibility with no "fair share" cost sharing and all improvements shall be provided or security provided as required by County Ordinance prior to the recordation of the Tract Map;

(b) If the Tract Map records after the "Benefit Fee Area" is implemented, then the Developer shall participate in the benefit program and should the value of required improvements installed by Developer exceed the benefit fees due, the Developer shall be eligible for reimbursements from future developers within the "Benefit Fee Area".

(24) All cul-de-sacs at the end of each street shall have a minimum paved radius of fifty (50) feet for fire and emergency vehicle turn around with parking restrictions.

(25) Any roads with a bicycle path must comply with Caltrans Bikeway Design criteria and shall be reviewed and approved by the Public Works Department.

(26) All improvements subject to a County Encroachment Permit shall be subject to review and approval by the Director of Public Works. All conditions of the Encroachment Permit shall supercede those shown on approved plans and specifications if determined more stringent as determined by the Director of Public Works.

(27) Tile lines within right-of-way must be removed and plugged at the right-of-way line, unless otherwise approved by the Imperial Irrigation District.

(28) An encroachment permit shall be secured from the Department of Public Works for any and all new, altered or unauthorized existing driveways, alterations to public roads and/ or connections to public roads that may be necessary to access the lots. (Entrance improvements shall meet the appropriate agency's standards, requirements, and/or approvals.) An encroachment permit is also required for any work within the road right-or-way.

(29) The Developer shall bear the cost for road name signs, regulatory and stop signs. Signs are to be constructed and installed by the Developer unless otherwise agreed to by both County and Developer. All costs incurred by County Public Works Department shall be billed to the Developer. The minimum structural section shall be 3 inches asphalt concrete over 9 inches of Class 2 Aggregate Base for roads classified as local. 4 inches of asphalt concrete over 12 inches of Class 2 Aggregate Base for roads classified as Industrial, Commercial, Collectors, or greater. These road sections are the minimum unless a project soils report, based on the highest Traffic Index (TI) expected to occur during a 20-year period following construction that indicates a thicker section is required. The TI value must be approved by the Director of Public Works.

(30) The Developer shall install street lighting within the tract boundary and along the subdivision frontage with all costs borne by the Developer. Street Lighting shall be installed to the requirements and standards of the County of Imperial, IID and the Heber Public Utility District. The street lighting shall be maintained by the assessment district as provided for in Condition 17.

(31) Payment to the County Public Works Department or bonding for two future applications of seal coat, necessary striping, and a 1½ inch resurfacing shall be provided prior to release of any phase.

(32) The Developer shall install fire hydrants and fire protection systems to plans and specifications approved by the County Public Works Department, the Imperial County Fire Department, the Uniform Fire Code and the Heber Public Utility District with all costs borne by the Developer.

(33) Concrete curb and gutter to be contiguous to sidewalks, unless otherwise specified and approved by the Public Works Department.

(34) All Public Improvement Plans and Grading and Drainage Plans shall be reviewed and approved by the Department of Public Works prior to construction by the Developer. All public improvements must meet the County Department of Public Works standard guidelines and standards prior to approval.

(35) Rights-of-way:

a. Correll Road is classified as a Minor Arterial requiring one hundred two (102) feet of right-of-way, being fifty-one (51) feet from the existing road centerline. The Developer must provide sufficient right-of-way to meet this road classification by dedication to the County prior to any utilities/improvement(s) being installed. The Developer shall provide a maximum of seventy-six (76) feet of right-of-way along the project frontage.
b. Pitzer Road is classified as a Major Collector requiring eight-for (84) feet of right-of-way. However, due to the significant residential of this development, it is requested that one hundred two (102) feet of right-of-way (Minor Arterial) be provided to meet this road classification. The Developer shall provide a maximum of fifty-one (51) feet of right-of-way along the project frontage.
c. All canal alignment right-of-way review, construction, and under-grounding shall be coordinated with the Imperial Irrigation District and the County Public Works Department.

(36) Road Paved Widths: Roads with sixty (60) feet of right-of-way shall be forty (40) feet paved section (curb-to-curb distance). Proposed bicycle lanes, parking or median curbs may also necessitate wider paved widths and the developer shall be responsible for providing all necessary improvements.

(37) Correll Road shall require a raised median.

(38) The Developer shall design and construct Correll Road and Pitzer Road to the satisfaction of the Public Works Director meeting County standards. The Developer shall design and construct Correll Road, along the subdivision frontage only, to provide thirty-two (32) feet of paved traveled way, as depicted on the tentative map. Should drainage consideration during final design require additional paving, an additional three feet may be required. The Developer shall design and construct Correll Road, between the westerly subdivision boundary and the end of improvements within the vicinity of the existing railroad tracks located on Correll Road, west of Rockwood Avenue, to provide twenty-five (25) feet of paved traveled way only. The Developer shall design and construct Pitzer Road, along the subdivision frontage only, to provide thirty-two (32) feet of paving at the intersection of Correll Road and Pitzer Road, tapering to a minimum of twenty-five (25) feet of paved traveled way at the southerly subdivision boundary and continuing to State Route 86.

(39) Full on-site road improvements shall be provided with the Final Map. All plans shall be reviewed and approved by the Imperial County Public Works Department.

(40) All minimum mitigation measures outlined in the Project Traffic Study shall be addressed by the Developer.

Drainage and Grading Conditions

(41) The Developer shall provide a Grading and Drainage Study/Plan to provide for property grading and erosion control which shall also include the prevention of sedimentation or damage to offsite properties (and storm water retention for a 100 year storm event). The Study/Plan shall be submitted to the Department of Public Works for review and approval and the applicant shall implement the approved plan prior to recordation of the Tract Map. Employment of Appropriate Stormwater Best Management Practices (BMP's) shall be included.

(42) The Developer shall provide to the Imperial County Public Works Department, a written verification from the Imperial Irrigation District, that they will accept surface drainage from this proposed subdivision.

(43) The Developer shall construct all of the required retention volume for a 100-year storm for the detention basin prior to the issuance of the first Certificate of Occupancy and hydrology and hydraulic calculations for determining the storm system design shall be provided to the satisfaction of the Director of Public Works. When appropriate, water surface profiles and adequate field survey cross-section data may also be required.

(44) Detention pond and all drainage appurtenances, including inlet and outlet structures, storm drains, etc., are to be maintained by the assessment district.

(45) The Developer shall establish an assessment district to fence and maintain the detention pond, install irrigation system, landscaping, and lights for the life of the project.

(46) All drainage structure designs must be reviewed and approved by the Department of Public Works prior to construction.

(47) All structures must be constructed above the 100-year storm flood level. All pad elevations and 100-year storm levels must be shown on the Final Tract Map Improvement Plans.

(48) All detention or retention ponds must be designed to drain out within seventy-two (72) hours of any storm event or developer shall provide a mosquito abatement plan to be reviewed and approved by the Division of Environmental Health Services/Health Department. These ponds shall also be designed to avoid accumulation of nuisance water and debris and shall be simple to maintain.

(49) Public drainage facilities shall be designed to carry the ten-year six hour storm underground, the 25-year storm between the top of curbs provided two 12' minimum width dry lanes exist and the 100-year frequency storm between the right-of-way lines with at least one 12' minimum dry lane open to traffic. All culverts in public rights-of-way, except direct connections to Imperial Irrigation District system facilities or culverts constructed by the Developer, but falling under the jurisdiction of

the Imperial Irrigation District, shall be designed to accommodate a 100-year frequency storm.

(50) Permanent drainage facilities and right-of-way, including access, shall be provided from development to point of satisfactory disposal.

(51) Retention volume on detention or retention basins should have a total volume capacity for a three (3) inch minimum precipitation covering the entire site with no C reduction factors. Volume can be considered by a combination of basin size and volume considered within parking and/or landscaping areas.

(52) There is no guarantee that a detention basin out letting to an IID facility or other storm drain system will not back up should the facility be full and unable to accept the project runoff. This provides the safety factor from flooding by ensuring each development can handle a 3" inch precipitation over the project site.

(53) The minimum finish floor elevation shall be 12" above top of fronting street curb unless property is below street level and/or 6" above the 100-year frequency storm event or storm track. A local engineering practice is to use a 5" precipitation event as a storm track in the absence of detailed flood information.

(54) The County is implementing a storm water quality program as required by the State Water Resources Control Board which may modify or add to the requirements and guidelines presented elsewhere in this document. This can include on-going monitoring of water quality of storm drain runoff, implementation of Best Management Practices (BMP's) to reduce storm water quality impacts downstream or along adjacent properties.

Miscellaneous Conditions of Approval:

(55) Provide public utility easements for power facilities on the project site. These proposed easements shall be approved by the IID prior to map recording. A letter of approval must be provided by the IID.

(56) The Developer shall provide engineered and detailed plans of water and sewer line systems for review and approval by the Heber Public Utility District and the Imperial County Department of Public Works, and other appropriate agencies. All necessary water, sewer and fire flow calculation shall be provided to both Heber Public Utility District (HPUD) and the County. This includes a copy of the HPUD water and sewer master plans.

(57) The Developer shall construct water and sewer lines to grade, location design and size, as approved by the Heber Public Utility District and Imperial County Department of Public Works.

(58) Water and sewer lines inside and outside the subdivision boundary must be within dedicated easements or in public roads.

(59) All subsequent map phases shall be reviewed by the Director of Public Works for changes in state law and/or design standards that are applicable.

(60) Prior to recordation of the Tract Map, the Developer shall provide a copy of the most current service capacity study/plan as prepared by a California Registered Engineer for HPUD. The analysis, shall at a minimum, identify the facility capacity to meet its existing needs, the already approved projects within the Heber Public Utilities District Service Area and this project.

(61) Provide hydraulic calculations for all waterlines to County Department of Public Works and Heber Public Utilities District for review and approval.

(62) The primary water lines serving the Tract Map are required to be looped prior to construction or at such time that the Registered Civil Engineer calculated flow rates warrant. The Fire/OES Department's maximum flow rate for single family dwellings is 1,000 gallons per minute and for multi-family dwellings will depend on the square footage per multi-family dwelling and all new utilities serving the Tract Map shall be under-grounded as required.

(63) The Developer shall provide to the Fire/Office of Emergency Services and the Department of Public Works hydraulic calculations for fire flow. The calculations shall analyze for the longest segment of lines that are looped or for the furthest hydrant in the project.

(64) The Developer shall install fencing as proposed around the entire subdivision and detention basin/park.

(65) The Developer shall be responsible for, participate in, and commit necessary resources to assure that all infrastructure(s) necessary is installed in the sequence and at the time required in order to implement the Tract Map.

(66) Water/sewer service to the project shall be secured from HPUD. The County shall not approve/record any phase of this development for actual construction until the HPUD provides (thorough its licensed engineer) certification that capacity for said phase is available and committed, e.g. lots B, C and D cannot be developed for future residential development unless and until the HPUD provides through its licensed engineer the appropriate certification that these services are available. Developer in accepting this approved map for the development of the 219 single family dwellings with all its conditions agrees and is required to sign an agreement with County that developer shall hold the County harmless for any and all litigation, damages, claims that may result if services are not available and project cannot be developed, even if project starts but is not allowed to be completed.

CALTRANS, District 11, Transportation Conditions:[4]

(67) The Developer shall provide a bond or other surety to pay for the Developer's fair share of intersection traffic signals at State Route 86 and Pitzer Road when traffic warrants are met.

(68) Any work performed within the CALTRANS right-of-way shall require an encroachment permit. For those portions of the project within the right-of-way the permit application must be stated in both Metric and English units (Metric first, with English in parentheses). (If work is anticipated in the right-of-way, the Developer's environmental document must include such work in their project description and indicate that an encroachment permit will be needed). Information regarding encroachment permits may be obtained by contacting our Permits Office at 619-688-6158. Early coordination with our agency is strongly advised for all encroachment permits.

(69) As part of the encroachment permit process, the Developer shall provide appropriate environmental approval (CEQA) for potential environmental impacts to the Department right-of-way. The Developer is responsible for quantifying the environmental impacts of the improvements (project level analysis) and completing all appropriate mitigation measures for the impacts. The Developer shall also be responsible for procuring any necessary permits or approvals from the regulatory and resource agencies for the improvements.

1 General Conditions
2 EEC Mitigation Measures
3 Public Works Letter
4 CALTRANS Letter

PM 23-39

SHEET 1 OF 5 SHEETS

HEBER MEADOWS
TRACT 956 UNIT NO. 1

OWNER'S STATEMENT

WE HEREBY STATE THAT WE ARE THE OWNER OF THE LAND SUBDIVIDED BY THIS MAP AND WE CONSENT TO THE PREPARATION AND RECORDATION OF THIS MAP CONSISTING OF FIVE (5) SHEETS AND DESCRIBED IN THE CAPTION THEREOF. WE HEREBY OFFER FOR DEDICATION TO PUBLIC USE CORRELL ROAD, PITZER ROAD, A PORTION OF BLOOMFIELD STREET, A PORTION OF SAWYER WAY, A PORTION OF GOLDFIELD WAY, A PORTION OF LITTLEFIELD WAY, AND PUBLIC UTILITY EASEMENTS AS SHOWN ON THIS MAP AS BEING PART OF THIS SUBDIVISION.

HEBER MEADOWS I, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY

WILLIAM W. LO
MANAGER

4/18/05
DATE

SECURITY PACIFIC BANK (FORMERLY KNOWN AS NETWORK BANK USA)
AS BENEFICIARY UNDER DEED OF TRUST, RECORDED JUNE 7, 2004
AS DOCUMENT NO. 04-017434 OF OFFICIAL RECORDS.

DAVID E. CLARY
SENIOR VICE PRESIDENT

4/25/05
DATE

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO)
ON April 21, 2005 BEFORE ME, Iris Gonzalez
PERSONALLY APPEARED WILLIAM W. LO PERSONALLY KNOWN
TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE)
TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE WITHIN INSTRUMENT
AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME IN HIS AUTHORIZED CAPACITY, AND THAT BY HIS SIGNATURE ON THE INSTRUMENT, THE PERSON, OR THE ENTITY UPON BEHALF OF WHICH THE PERSON ACTED, EXECUTED THE INSTRUMENT.

Iris Gonzalez
Commission Expires 7-13-08
NOTARY SIGNATURE

PRINT NOTARY NAME Patricia L. Plante
MY COMMISSION EXPIRES ON 10-11 , 20 05
MY PRINCIPAL PLACE OF BUSINESS IS IN San Bernardino COUNTY.

STATE OF CALIFORNIA)
COUNTY OF ~~SAN DIEGO~~ San Bernardino
ON April 25, 2005 BEFORE ME, Patricia L. Plante
PERSONALLY APPEARED DAVID E. CLARY PERSONALLY KNOWN
TO ME (~~OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE~~)
TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT ~~HE~~ SHE EXECUTED THE SAME IN ~~HIS~~ HER AUTHORIZED CAPACITY, AND THAT BY ~~HIS~~ HER SIGNATURE ON THE INSTRUMENT, THE PERSON, OR THE ENTITY UPON BEHALF OF WHICH THE PERSON ACTED, EXECUTED THE INSTRUMENT.

Patricia L. Plante
NOTARY SIGNATURE

PRINT NOTARY NAME _____
MY COMMISSION EXPIRES ON _____ , 20 _____
MY PRINCIPAL PLACE OF BUSINESS IS IN _____ COUNTY.

CERTIFICATE RECORDED:
TITLE: Tax Certificate
BOOK 2141 PAGE 1368

CERTIFICATE RECORDED:
TITLE: IA Certificate
BOOK 2141 PAGE 1370

CERTIFICATE RECORDED:
TITLE: Subdivision Guarantee
BOOK 2141 PAGE 1371

CERTIFICATE RECORDED:
TITLE: Agreement
BOOK 2141 PAGE 1372

CERTIFICATE RECORDED:
TITLE: _____
BOOK _____ PAGE _____

CERTIFICATE RECORDED:
TITLE: _____
BOOK _____ PAGE _____

CERTIFICATE RECORDED:
TITLE: _____
BOOK _____ PAGE _____

CERTIFICATE RECORDED:
TITLE: _____
BOOK _____ PAGE _____

SOILS REPORT

A SOILS REPORT HAS BEEN PREPARED SPECIFICALLY FOR THIS SUBDIVISION BY: MEDALL, ARAGON GEOTECHNICAL, INC. PROJECT NO. 3840-SFL DATED: JUNE 7, 2004 SAID REPORT IS ON FILE IN THE OFFICE OF THE COUNTY SURVEYOR OF IMPERIAL COUNTY AND IS AVAILABLE FOR PUBLIC INSPECTION.

JOB NO. 0349

HALE ENGINEERING
CIVIL ENGINEERING SURVEYING LAND PLANNING
7610 CONWAY COURT
SAN DIEGO, CA 92111
(858) 715-1420
(858) 715-1424 FAX

PARCEL A:

THAT PORTION OF LOT 32 OF TRACT 48 IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO MAP 361, IN O.R. BOOK 6, PAGE 32, TOGETHER WITH THAT PORTION OF BLOCK 15, THE TOWNSITE OF HEBER, COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO MAP 1021, IN BOOK 1, PAGE 21, OFFICIAL MAPS, FILED IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY, ALL IN TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID LOT 32 OF TRACT 48, SAID NORTHEAST CORNER ALSO BEING THE TRUE POINT OF BEGINNING; THENCE ALONG THE EASTERLY LINE OF SAID LOT 32 OF TRACT 48, SOUTH 01°12'32" EAST 1091.36 FEET TO THE SOUTHEAST CORNER OF SAID LOT 32 OF TRACT 48, SAID CORNER BEING ON THE NORTHERLY LINE OF SAID BLOCK 15; THENCE ALONG SAID NORTHERLY LINE OF SAID BLOCK 15, NORTH 89°08'41" EAST 2.40 FEET TO THE NORTHEAST CORNER OF SAID BLOCK 15; THENCE ALONG THE EASTERLY LINE OF SAID BLOCK 15, SOUTH 01°11'07" EAST 759.47 FEET TO THE SOUTHEAST CORNER OF SAID BLOCK 15; THENCE ALONG THE SOUTHERLY LINE OF SAID BLOCK 15, SOUTH 89°08'53" WEST 342.80 FEET; THENCE LEAVING SAID SOUTHERLY LINE OF SAID BLOCK 15, NORTH 01°11'58" WEST 16.72 FEET; THENCE NORTH 01°11'58" WEST 285.00 FEET; THENCE SOUTH 88°48'02" WEST 10.00 FEET; THENCE NORTH 01°11'58" WEST 635.00 FEET; THENCE SOUTH 88°48'02" WEST 75.00 FEET; THENCE NORTH 01°11'58" WEST 170.00 FEET; THENCE SOUTH 88°48'02" WEST 828.00 FEET; THENCE NORTH 01°11'58" WEST 558.46 FEET TO A POINT ON THE NORTHERLY LINE OF SAID LOT 32 OF TRACT 48; THENCE ALONG SAID NORTHERLY LINE OF LOT 32 OF TRACT 48, NORTH 89°35'58" EAST 1272.14 FEET TO THE TRUE POINT OF BEGINNING.

SAID PROPERTY IS ALSO SHOWN AS PARCEL 1 ON THE CERTIFICATE OF COMPLIANCE FOR LOT LINE ADJUSTMENT #00191, AMENDED RECORDED, May 04 2005 AS INSTRUMENT NO. 017071 IN BOOK 2130, PAGE 1211 OF OFFICIAL RECORDS.

PARCEL B:

THAT PORTION OF LOT 32 OF TRACT 48 IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO MAP 361, IN BOOK 6, PAGE 32, TOGETHER WITH THAT PORTION OF BLOCK 15, AND A PORTION OF BLOCK 17, AND A PORTION OF BLOCK 18, IN THE TOWNSITE OF HEBER, COUNTY OF IMPERIAL STATE OF CALIFORNIA, ACCORDING TO MAP 1021, IN BOOK 1, PAGE 21 OF OFFICIAL MAPS, FILED IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY, ALSO TOGETHER WITH THAT PORTION OF SIXTH STREET AS ABANDONED BY DOCUMENT RECORDED IN BOOK 1121, PAGE 398-400 OF OFFICIAL RECORDS, ALL IN TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID LOT 32 OF TRACT 48; THENCE ALONG THE NORTHERLY LINE OF SAID LOT 32 OF TRACT 48, SOUTH 89°35'58" WEST 1272.14 FEET TO THE TRUE POINT OF BEGINNING; THENCE LEAVING SAID NORTHERLY LINE OF LOT 32 OF TRACT 48, SOUTH 01°11'58" EAST 558.46 FEET; THENCE NORTH 88°48'02" EAST 828.00 FEET; THENCE SOUTH 01°11'58" EAST 75.00 FEET; THENCE SOUTH 88°48'02" WEST 75.00 FEET; THENCE SOUTH 01°11'58" EAST 635.00 FEET; THENCE NORTH 88°48'02" EAST 10.00 FEET; THENCE SOUTH 01°11'58" EAST 285.00 FEET; THENCE NORTH 88°48'02" EAST 16.72 FEET; THENCE SOUTH 01°11'58" EAST 118.03 FEET TO A POINT ON THE SOUTHERLY LINE OF SAID BLOCK 15; THENCE ALONG SAID SOUTHERLY LINE OF SAID BLOCK 15, THE SOUTHERLY LINE OF SAID BLOCK 18, DISTANT THEREON 342.80 FEET FROM THE SOUTHEAST CORNER THEREOF; THENCE ALONG SAID SOUTHERLY LINE OF SAID BLOCK 15, THE SOUTHERLY LINE OF SAID BLOCK 17, AND THE CENTERLINE OF THAT PORTION OF SIXTH STREET, ABANDONED BY DOCUMENT RECORDED IN BOOK 1121, PAGES 398-400 OF OFFICIAL RECORDS, SOUTH 89°08'53" WEST 1317.83 FEET TO AN INTERSECTION WITH THE PROLONGATION OF THE WESTERLY LINE OF SAID LOT 1 OF BLOCK 17; THENCE ALONG SAID PROLONGATION AND SAID WESTERLY LINE OF SAID LOT 1 OF BLOCK 17, NORTH 00°49'07" WEST 759.92 FEET TO THE NORTHWEST CORNER OF SAID LOT 1 OF BLOCK 17, SAID CORNER BEING ON THE SOUTHERLY LINE OF SAID LOT 32 OF TRACT 48; THENCE ALONG SAID SOUTHERLY LINE OF SAID LOT 32 OF TRACT 48, SOUTH 89°09'43" WEST 330.09 FEET TO THE EASTERLY LINE OF THE WESTERLY 300.00 FEET OF SAID LOT 32 OF TRACT 48; THENCE ALONG SAID EASTERLY LINE OF THE WEST 300.00 FEET OF LOT 32 OF TRACT 48, NORTH 00°49'42" WEST 1107.20 FEET TO A POINT ON THE NORTHERLY LINE OF SAID LOT 32 OF TRACT 48; THENCE ALONG SAID NORTHERLY LINE OF SAID LOT 32 OF TRACT 48, NORTH 89°35'58" EAST 809.03 FEET TO THE TRUE POINT OF BEGINNING.

SAID PROPERTY IS ALSO SHOWN AS PARCEL 2 ON THE CERTIFICATE OF COMPLIANCE FOR LOT LINE ADJUSTMENT #00191, AMENDED RECORDED, May 04, 2005 AS INSTRUMENT NO. 017072 IN BOOK 2130, PAGE 1211 OF OFFICIAL RECORDS.

CLERK OF THE BOARD STATEMENT

I, SYLVIA BERMUDEZ, CLERK OF THE BOARD OF SUPERVISORS OF THE COUNTY OF IMPERIAL, HEREBY STATE THAT THE BOARD OF SUPERVISORS IN AND FOR THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, HAVE APPROVED THIS FINAL MAP, CONSISTING OF 5 SHEETS, AS THE CITY MAP OF HEBER MEADOWS TRACT 956 UNIT NO. 1, FOR SUBDIVISION PURPOSES IN ACCORDANCE WITH THE APPROVAL OF THE TENTATIVE MAP THEREOF AND HAS ACTED ON BEHALF OF THE PUBLIC, THE OFFER FOR DEDICATION OF PUBLIC ROAD RIGHT OF WAYS AND PUBLIC UTILITY EASEMENTS AS SHOWN ON THIS MAP FOR PUBLIC USE.

SYLVIA BERMUDEZ
CLERK OF THE BOARD OF SUPERVISORS

PLANNING DIRECTOR'S STATEMENT

I, JURG HEUBERGER, DIRECTOR OF PLANNING OF THE COUNTY OF IMPERIAL, HEREBY STATE THAT THIS FINAL MAP, CONSISTING OF 5 SHEETS, CONFORMS WITH THE TENTATIVE MAP AND THE CONDITIONS RELATED THERETO AS APPROVED BY THE BOARD OF SUPERVISORS ON THE 3RD DAY OF MAY, 2005.

JURG HEUBERGER, PLANNING DIRECTOR
COUNTY OF IMPERIAL

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS MAP IS THE CCS 83, ZONE 6, GRID BEARING BETWEEN FIRST ORDER STATION "HEBER RM1" AND FIRST ORDER STATION "MCABE RM 1" AS SAID STATIONS ARE PUBLISHED BY THE NATIONAL GEODETIC SURVEY DATABASE. I.E. N 43°32'59" E

QUOTED BEARINGS FROM REFERENCE MAPS/DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM. SEE SHEET 2 FOR DETAIL.

SURVEYOR'S STATEMENT

I, DALE C. GROSS, A LICENSED LAND SURVEYOR OF THE STATE OF CALIFORNIA, HEREBY CERTIFY THAT THE SURVEY OF THIS SUBDIVISION WAS MADE BY ME OR UNDER MY DIRECTION BETWEEN JUNE 18, 2003 AND AUGUST 6, 2003 AND THAT SAID SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS ARE OF THE CHARACTER INDICATED AND WILL BE SET IN SUCH POSITION WITHIN ONE YEAR AFTER THE FILING OF THIS MAP AND SUCH MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED ON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF HEBER MEADOWS I, LLC. I HEREBY STATE THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP.

Dale C Gross 4/6/05
DALE C. GROSS DATE
PLS 7632

COUNTY SURVEYOR'S STATEMENT

I, TIMOTHY B. JONES, COUNTY SURVEYOR OF THE COUNTY OF IMPERIAL, HEREBY STATE; THAT I HAVE EXAMINED THIS MAP; THAT THE SUBDIVISION SHOWN IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF; THAT ALL PROVISIONS OF CHAPTER 2, TITLE 7 OF THE GOVERNMENT CODE OF THE STATE OF CALIFORNIA AND DIVISION 2, TITLE 5 OF THE CODIFIED ORDINANCE OF IMPERIAL COUNTY HAVE BEEN COMPLIED WITH; AND, THAT I AM SATISFIED THAT THE MAP IS TECHNICALLY CORRECT.

Apr 27, 2005
TIMOTHY B. JONES DATE
PLS 5926
IMPERIAL COUNTY SURVEYOR
LICENSE EXPIRATION DATE: 12-31-2006

TITLE COMPANY'S STATEMENT

THE UNDERSIGNED HEREBY CERTIFIES THAT THE PERSONS SPECIFIED IN THE OWNER'S STATEMENT SHOWN HEREON ARE THE OWNERS AND THE ONLY ONES WHOSE CONSENT IS NECESSARY TO PASS TITLE TO THE LAND WITHIN THIS SUBDIVISION.

JOE GIBSON TITLE OFFICER
FIRST AMERICAN TITLE COMPANY

COUNTY RECORDER'S STATEMENT

DOCUMENT NO. 05-21039

I, DOLORES PROVENCIO, COUNTY RECORDER OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, HEREBY CERTIFY THAT I HAVE ACCEPTED FOR FILING THIS MAP, CONSISTING OF 5 SHEETS, AT THE REQUEST OF: DALE C. GROSS, THIS 2nd DAY OF June, 2005, AT 2:34 O'CLOCK P.M.

DOLORES PROVENCIO
COUNTY RECORDER

BY Dolores Provencio
DEPUTY

FEE: $ 15.00

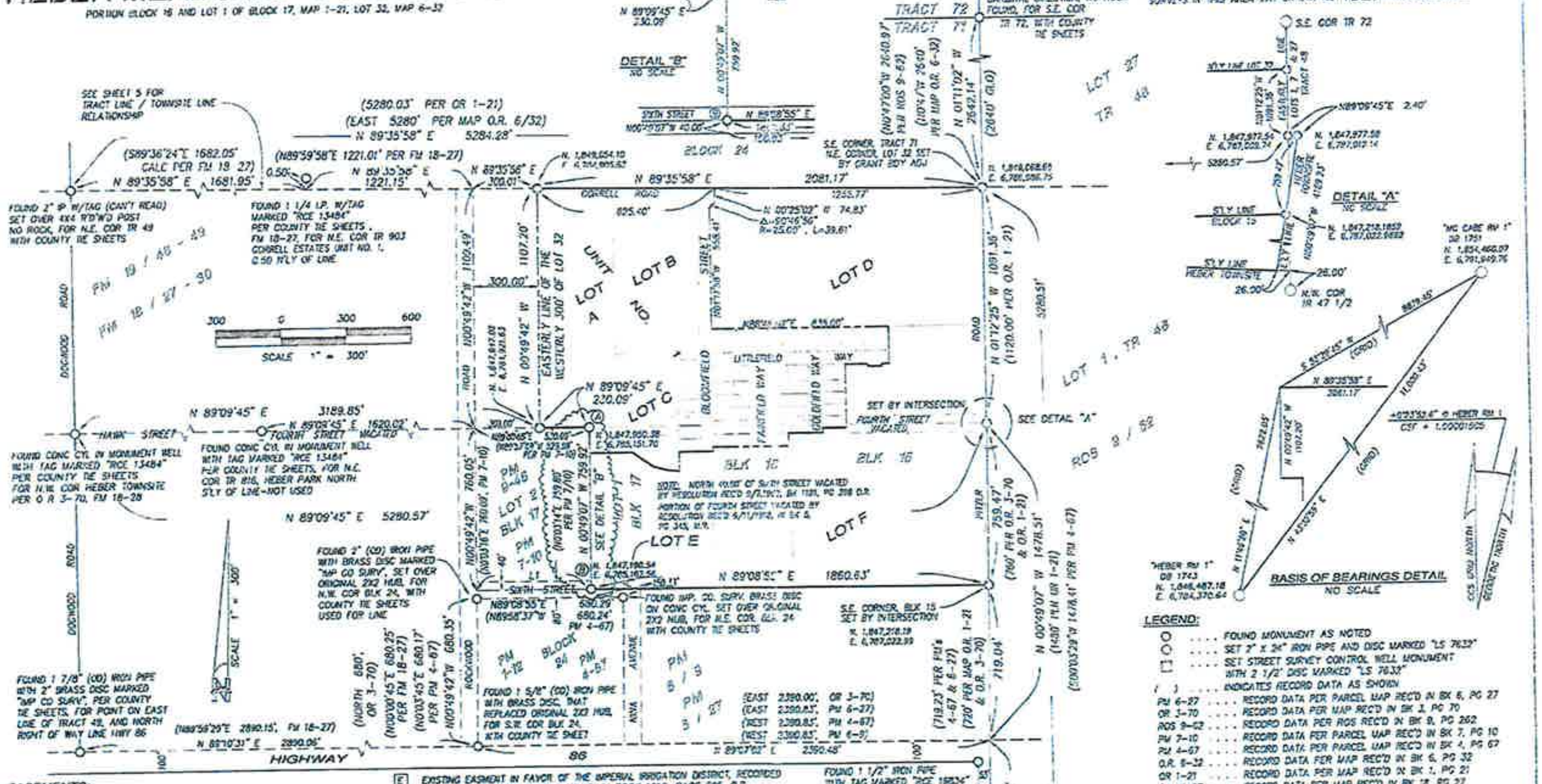
FM 25-40

SHEET 2 OF 5 SHEETS

HEBER MEADOWS TRACT 956 UNIT 1

PORTION BLOCK 16 AND LOT 1 OF BLOCK 17, MAP 1-21, LOT 32, MAP 6-32

SURVEYOR'S NOTE:
THE EASTERLY BOUNDARY SHOWN HEREON, WAS ESTABLISHED BY PROCEDURE RECOMMENDED BY THE COUNTY SURVEYOR OF IMPERIAL COUNTY. OTHER SURVEYS IN THIS AREA MAY OR MAY NOT REFLECT THIS PROCEDURE.



LEGEND:

- ○ .... FOUND MONUMENT AS NOTED
- ○ .... SET 2" X 24" IRON PIPE AND DISC MARKED "LS 7632"
- □ .... SET STREET SURVEY CONTROL WELL MONUMENT WITH 2 1/2" DISC MARKED "LS 7632"
- ( ) .... INDICATES RECORD DATA AS SHOWN
- PM 6-27 .... RECORD DATA PER PARCEL MAP REC'D IN BK 6, PG 27
- OR 3-70 .... RECORD DATA PER MAP REC'D IN BK 3, PG 70
- ROS 9-62 .... RECORD DATA PER ROS REC'D IN BK 9, PG 262
- PM 7-10 .... RECORD DATA PER PARCEL MAP REC'D IN BK 7, PG 10
- PM 4-67 .... RECORD DATA PER PARCEL MAP REC'D IN BK 4, PG 67
- O.R. 6-32 .... RECORD DATA PER MAP REC'D IN BK 6, PG 32
- OR 1-21 .... RECORD DATA PER MAP REC'D IN BK 1, PG 21
- FM 18-27 .... RECORD DATA PER MAP REC'D IN BK 18, PG 27
- ———— .... INDICATES SUBDIVISION BOUNDARY
- — — — .... INDICATES UNIT NO. 1 BOUNDARY

THE PROPERTY LINE, ALONG AN EXTENSION OF THE LOT LINE OR RADIAL TO THE CURVE POINT. WHERE LOT LINES ARE NOT AT RIGHT ANGLES OR RADIAL, THE OFFSET COURSE AND DISTANCE WILL BE SHOWN. (B) REAR LOT CORNERS WILL BE MONUMENTED WITH A 3/4" X 18" IRON PIPE AND DISC MARKED "LS 7632".

WHERE CENTERLINE INTERSECTIONS CONFLICT WITH SEWER MANHOLES, THE CENTERLINE MONUMENT WILL BE SET AT A 5.00' OFFSET TO THE INTERSECTION, AS SHOWN HEREON.

NOTES:

1. BEGINNING AND ENDING LOTS NUMBERS ARE 1 AND 50, "A", "B", "C".
2. TOTAL NUMBER OF LOTS IS 53.
3. TOTAL AREA (GROSS) IS 30.48 ACRES.
4. ALL DISTANCES AND/OR STREET WIDTHS, SHOWN WITHOUT DECIMALS REPRESENT THAT DISTANCE TO THE HUNDRETH.

EASEMENTS:

- △1 10.00 FOOT PUBLIC UTILITY EASMENT, UNLESS OTHERWISE SHOWN, GRANTED HEREON.
- △2 20.00 FOOT POWER LINE EASMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT.
- △3 40.00 FOOT DRAINAGE EASMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT.
- △4 20.00 FOOT PUBLIC EASEMENT FOR WATER PURPOSES, GRANTED HEREON, IN FAVOR OF HEBER PUBLIC UTILITY DISTRICT

E EXISTING EASMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED FEBRUARY 27, 1959 AS FILE NO. 6, IN BOOK 1016, PAGE 595, O.R.

F EXISTING EASMENT IN FAVOR OF IMPERIAL IRRIGATION DISTRICT, ACQUIRED FOR RIGHT OF WAY, UNDER THE ACT OF MARCH 3, 1891. (26 STAT. 1101) 43 USC SS946-950 - PER TITLE REPORT.

EXISTING EASMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED 1/20/1944, AS FILE NO. 25, IN BOOK 612, PAGE 331 O.R., CAN NOT BE PLOTTED FROM THE RECORD.

MONUMENT TABLE:

Ⓐ 1 1/2" IP & DISC "LS 3590" PER PM 7-10 PM 9-46 HELD 0.28' S'LY FOR N.W. CORNER LOT 1, BLOCK 17, OR 3-70 (SEE PM 7-10 & PM 9-46)

Ⓑ 1 1/4" IP & DISC "RCE 28447" PER PM 7-10

LINE DATA TABLE:

NO	BEARING	DISTANCE
L1	N 89°08'55" E	529.96'
L1	N 89°38'56" W	529.98' PER PM 7-10

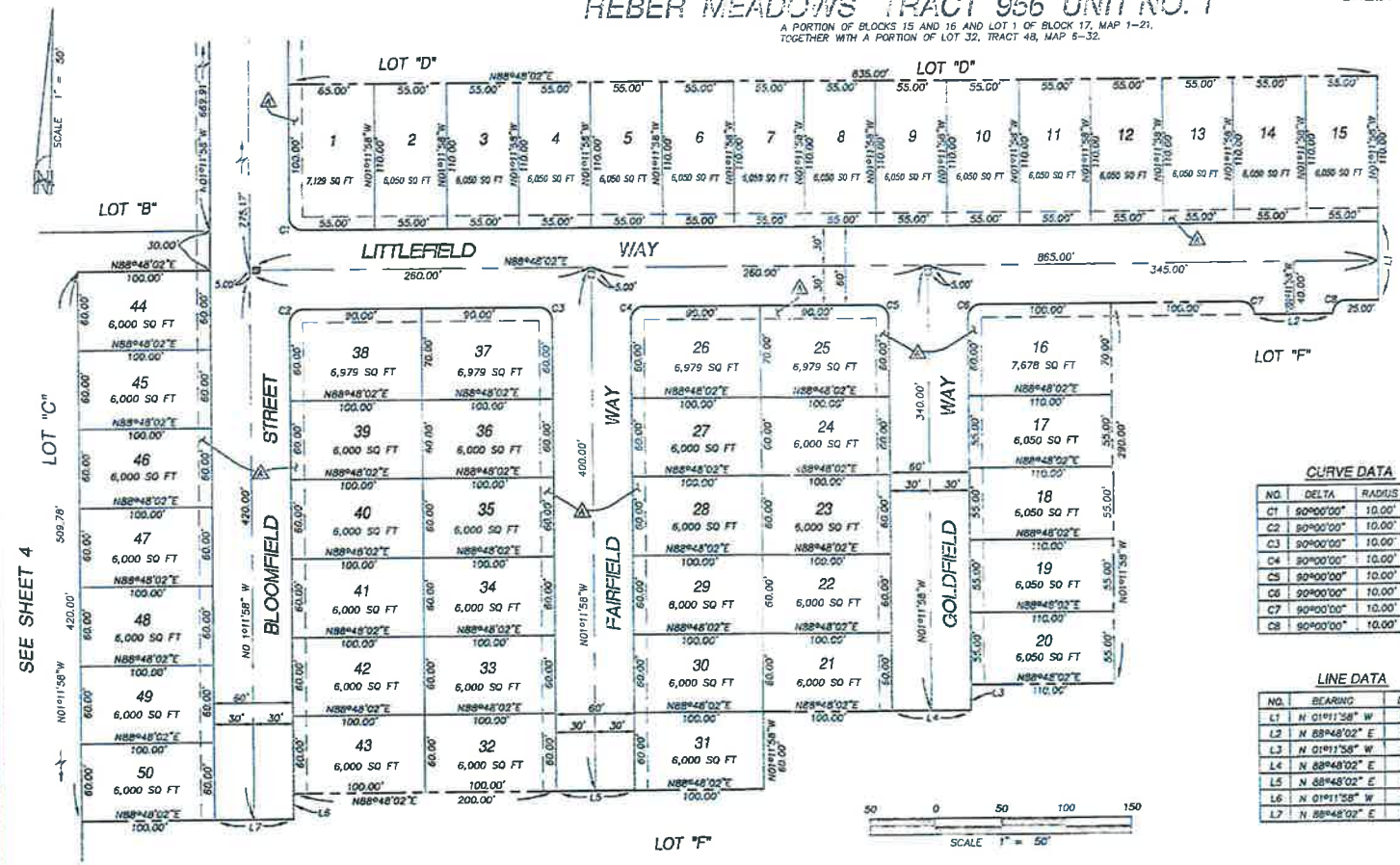
JOB NO. 0349

HALE ENGINEERING
CIVIL ENGINEERING SURVEYING LAND PLANNING
7910 CONVOY COURT
SAN DIEGO, CA 92111
(858) 715-1420
(858) 715-1424 FAX

EM 23-41

HEBER MEADOWS TRACT 956 UNIT NO. 1

A PORTION OF BLOCKS 15 AND 16 AND LOT 1 OF BLOCK 17, MAP 1-21, TOGETHER WITH A PORTION OF LOT 32, TRACT 48, MAP 5-32.



CURVE DATA

NO.	DELTA	RADIUS	LENGTH
C1	90°00'00"	10.00'	15.71'
C2	90°00'00"	10.00'	15.71'
C3	90°00'00"	10.00'	15.71'
C4	90°00'00"	10.00'	15.71'
C5	90°00'00"	10.00'	15.71'
C6	90°00'00"	10.00'	15.71'
C7	90°00'00"	10.00'	15.71'
C8	90°00'00"	10.00'	15.71'

LINE DATA

NO.	BEARING	DISTANCE
L1	N 01°11'58" W	60.00'
L2	N 88°48'02" E	60.00'
L3	N 01°11'58" W	20.00'
L4	N 88°48'02" E	60.00'
L5	N 88°48'02" E	60.00'
L6	N 01°11'58" W	20.00'
L7	N 88°48'02" E	60.00'

EASEMENTS:

A 10.00 FOOT PUBLIC UTILITY EASEMENT, UNLESS OTHERWISE SHOWN, GRANTED HEREON.

B 20.00 FOOT POWER LINE UTILITY EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT. (SEE SHEET 5)

C 40.00 FOOT DRAINAGE EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT. (SEE SHEETS 4 & 5)

D 20.00 FOOT PUBLIC EASEMENT FOR WATER PURPOSES, GRANTED HEREON, IN FAVOR OF, HEBER PUBLIC UTILITY DISTRICT. (SEE SHEET 5)

E EXISTING EASEMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED FEBRUARY 27, 1959 AS FILE NO. 6, IN BOOK 1015, PAGE 595, O.R.

F EXISTING EASEMENT IN FAVOR OF IMPERIAL IRRIGATION DISTRICT, ACQUIRED FOR RIGHT OF WAY, UNDER THE ACT OF MARCH 3, 1891, (26 STAT. 1101) 43 USC 33946-950 - PER TITLE REPORT.

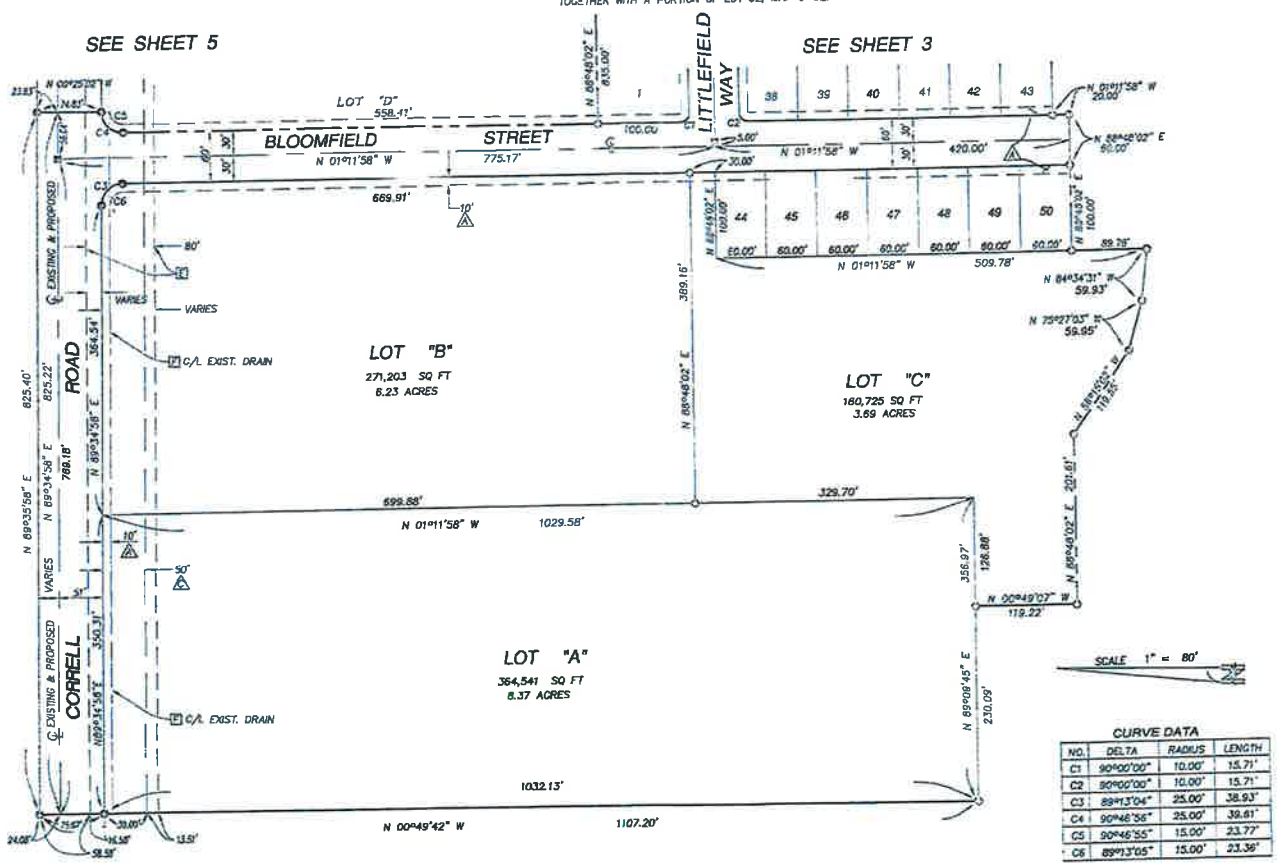
JOB NO. 0349

HALE ENGINEERING
CIVIL ENGINEERING SURVEYING LAND PLANNING
7910 CENTURY COURT
SAN DIEGO, CA 92111
(858) 716-1420
(858) 715-1424 FAX

EM 23-42

HEBER MEADOWS TRACT 956 UNIT NO. 1

A PORTION BLOCKS 15 AND 16 AND LOT 1 OF BLOCK 17, MAP 1-21, TOGETHER WITH A PORTION OF LOT 32, MAP 6-32.



CURVE DATA

NO.	DELTA	RADIUS	LENGTH
C1	90°00'00"	10.00'	15.71'
C2	90°00'00"	10.00'	15.71'
C3	89°13'04"	25.00'	38.93'
C4	90°46'56"	25.00'	39.61'
C5	90°46'55"	15.00'	23.77'
C6	89°13'05"	15.00'	23.36'

EASEMENTS:

A. 10.00 FOOT PUBLIC UTILITY EASEMENT, UNLESS OTHERWISE SHOWN, GRANTED HEREON.

B. 20.00 FOOT POWER LINE EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT. (SEE SHEET 5)

C. 40.00 FOOT DRAINAGE EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT.

D. 20.00 FOOT PUBLIC EASEMENT FOR WATER PURPOSES, GRANTED HEREON, IN FAVOR OF HEBER PUBLIC UTILITY DISTRICT. (SEE SHEET 5)

E. EXISTING EASEMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED FEBRUARY 27, 1959 AS FILE NO. 6, IN BOOK 1016, PAGE 565, O.R.

F. EXISTING EASEMENT IN FAVOR OF IMPERIAL IRRIGATION DISTRICT, ACQUIRED FOR RIGHT OF WAY, UNDER THE ACT OF MARCH 3, 1891. (26 STAT. 1101) 43 USC 59946-950 - PER TITLE REPORT.

EXISTING EASEMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED 1/20/1944, AS FILE NO. 25, IN BOOK 612, PAGE 331 O.R., CAN NOT BE PLOTTED FROM THE RECORD.

JOB NO. 0349

HALE ENGINEERING
CIVIL ENGINEERING SURVEYING LAND PLANNING
7910 CENTRY COURT
SAN DIEGO, CA 92111
(858) 715-1620
(858) 715-1624 FAX

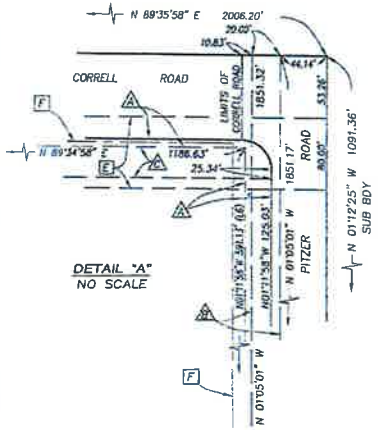
60 0 80 160 240
SCALE 1" = 80'

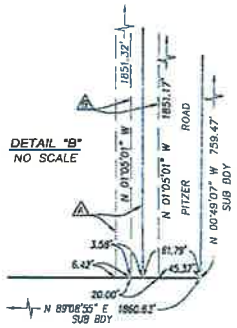
FM 23-43

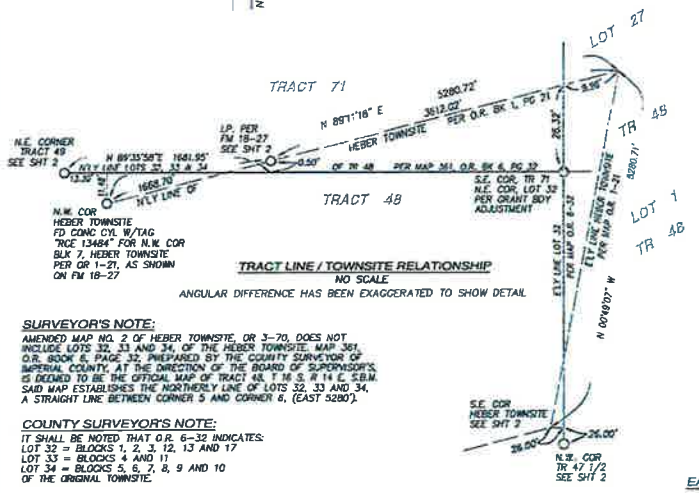
SHEET 5 OF 5 SHEETS

HEBER MEADOWS TRACT 956 UNIT 1

LIMITS OF CORRELL ROAD AND PITZER ROAD – EASEMENT DETAILS







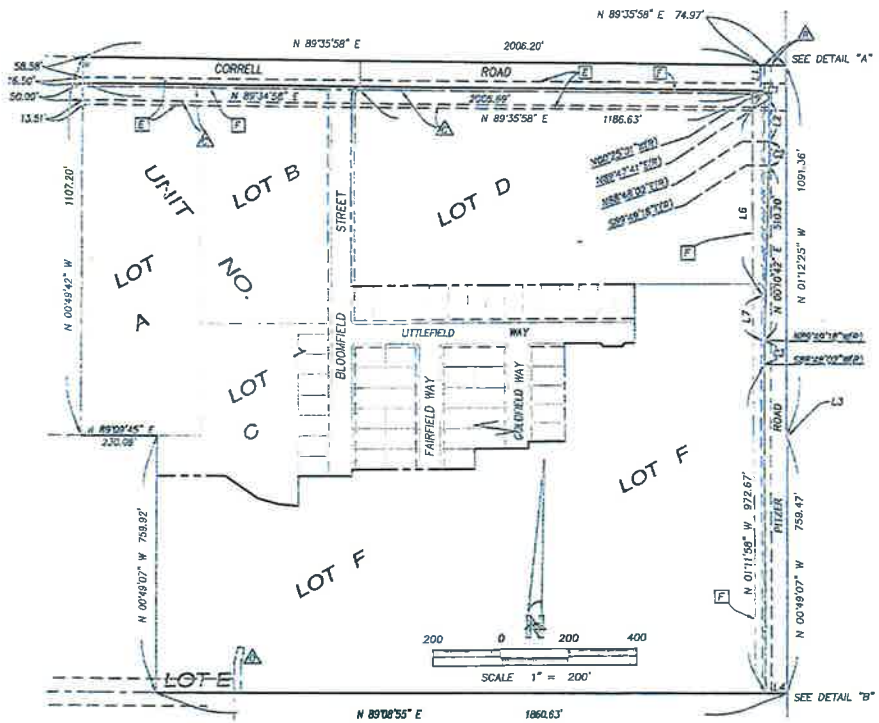
TRACT LINE / TOWNSITE RELATIONSHIP
NO SCALE
ANGULAR DIFFERENCE HAS BEEN EXAGGERATED TO SHOW DETAIL

SURVEYOR'S NOTE:

AMENDED MAP NO. 2 OF HEBER TOWNSITE, OR 3-79, DOES NOT INCLUDE LOTS 32, 33 AND 34, OF THE HEBER TOWNSITE MAP 361, O.R. BOOK 6, PAGE 32, PREPARED BY THE COUNTY SURVEYOR OF IMPERIAL COUNTY, AT THE DIRECTION OF THE BOARD OF SUPERVISOR'S, IS DEEMED TO BE THE OFFICIAL MAP OF TRACT 48, T 16 S, R 14 E, S.B.M. SAID MAP ESTABLISHES THE NORTHERLY LINE OF LOTS 32, 33 AND 34, A STRAIGHT LINE BETWEEN CORNER 5 AND CORNER 6, (EAST 5280').

COUNTY SURVEYOR'S NOTE:

IT SHALL BE NOTED THAT O.R. 6-32 INDICATES:
LOT 32 = BLOCKS 1, 2, 3, 12, 13 AND 17
LOT 33 = BLOCKS 4 AND 11
LOT 34 = BLOCKS 5, 6, 7, 8, 9 AND 10
OF THE ORIGINAL TOWNSITE.



CURVE TABLE:

NO.	DELTA	RADIUS	LENGTH
C1	89°13'05"	25.00'	38.93'
C2	1°22'39"	2949.00'	70.90'
C3	1°22'39"	3051.00'	73.36'

LINE TABLE:

NO.	BEARING	DISTANCE
L1	N 01°12'25" W	74.49'
L2	N 01°11'58" W	125.03'
L3	N 89°09'45" E	2.40'
L4	N 89°08'55" E	61.79'
L5	N 00°49'42" W	75.07'
L6	N 01°11'58" W	591.13'
L7	N 00°10'42" E	129.56'

EASEMENTS:

A 10.00 FOOT PUBLIC UTILITY EASEMENT, UNLESS OTHERWISE SHOWN, GRANTED HEREON.
B 20.00 FOOT POWER LINE EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT.
C 40.00 FOOT DRAINAGE EASEMENT, GRANTED HEREON, IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT.
D 20.00 FOOT PUBLIC EASEMENT FOR WATER PURPOSES, GRANTED HEREON, IN FAVOR OF, HEBER PUBLIC UTILITY DISTRICT

E EXISTING EASEMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED FEBRUARY 27, 1959 AS FILE NO. 6, IN BOOK 1016, PAGE 595, O.R.
F EXISTING EASEMENT IN FAVOR OF IMPERIAL IRRIGATION DISTRICT, ACQUIRED FOR RIGHT OF WAY, UNDER THE ACT OF MARCH 3, 1891. (26 STAT. 1101) 43 USC 55946-950 – PER TITLE REPORT.

EXISTING EASEMENT IN FAVOR OF THE IMPERIAL IRRIGATION DISTRICT, RECORDED 1/20/1944, AS FILE NO. 25, IN BOOK 612, PAGE 331 O.R., CAN NOT BE PLOTTED FROM THE RECORD.

JOB NO. 0349

HALE ENGINEERING
CIVIL ENGINEERING SURVEYING LAND PLANNING
7810 CONVOY COURT (858) 715-1420
SAN DIEGO, CA 92111 (858) 715-1424 FAX

Heber Meadows I, LP

6339 Paseo Del Lago
Carlsbad, CA 92011
760-456-6000

Imperial County Planning and Development Services Planning / Building

Plan Check Response #1	**Date:** TBD
Plan Check Case #: TR # 00992	**Project Name:** Miraluz Apartments
Site: 185 East Willowbrook Way, Heber CA	
Project Type: 5 Lot Tentative Map and 60 Unit Affordable Apartments	**Prepared By:** David Davis

Joe Hernandez
Imperial County Planning & Development Services
Planner IV
801 Main Street
El Centro, CA 92243
442-265-1736
bkoujah@ci.irvine.ca.us

Dear Joe,

The following are responses to the "Notice of Incomplete Application" Review comments dated 12-9-2020. Note that responses are below in black and each response is in *blue italicized* text.

Department Staff have reviewed the Major Subdivision application and supporting documentation and has **Deemed Incomplete** the application for the following reasons:

Major Subdivision Application:

1. Item #1. Major Subdivision application shows Heber Meadows I, LP as the property owner, and Title Report shows Heber 20, LLC, as the vested owner. Please clarify and correct accordingly.

   Response: The property was recently acquired from Heber 20, LLC, A California Limited Liability Company. The current property owner is Heber Meadows Land Holding LLC, A California Limited Liability Company. This is an affiliate of Chelsea Investment Corporation who manages properties. The first phase of apartments will be owned and managed by Heber Meadows I, LP which also an affiliate of Chelsea Investment Corporation. The marketing name for the project will be Miraluz Apartments.

2. Item #10 and #11. Please clarify the propose sewer and water system.

   Response: Existing sewer and water lines are located in Bloomfield Street, Correll

Road and Pitzer Road. Each parcel will connect a new lateral for both sewer and water to serve each proposed development. Mainlines are now shown on the proposed Tentative Tract Map along with laterals to the parcels for Domestic and Fire Flow.

3. Item #12. Describe independent access to each individual propose parcel.

   Response: In order to assist in the distribution of traffic and be sure each site will maintain an emergency access we created an Master access plan. With this access plan, each site will have two points of ingress and egress for each parcel. These access easements are now shown on the Tentative Tract Map. Access onto Bloomfield, Correll Road and Pitzer Road will be standard driveway cuts with access gates. Access from Willowbrook Place will also be standard driveway cuts with access gates.

Project Description:

Please note that any unresolved conditions of approval from Tract 00956 will need to be addressed prior to the submittal with the appropriate agency.

Response: We have reviewed the original conditions of approval for Tract 00956. Some of these conditions have been completed and others are no longer applicable. We have prepared a Response to Comments document for the original "Conditions of Approval" for your review. As part of the proposed Tentative Tract Map a new traffic report has been prepared and reviewed by Imperial County and Caltrans which meets the new VMT regulations. Regardless of other segments and intersections which may be identified as having a direct or indirect impact, this project will be conditioned to construct a new signalized intersection and Pitzer and SR-86. We are also preparing an ICE report which will be submitted to the Caltrans for review. This review could result in a round about being selected instead of a signalized intersection. With either intersection improvement, this project will be condition well beyond any direct or indirect impacts which will fully mitigate the projects impacts to traffic.

General:

1. The previous studies for Tract 00956 Heber Meadows reflected approximately 267 multiple family housing units. Please provide updated assessments reflecting the propose 300 units for the following studies:

   Response: The project site is zoned High Density Residential which is 29 du/ac. The previous traffic report anticipated 222 single-family homes and 476 apartments. The 11-14-2003 traffic report ADT's generated was estimated at 5,270 average daily trips. The proposed development will replace the 476 apartments with 320 apartments that will reduce the ADT generated by 1,398. This would be a new total generation rate of 3,872 average daily trips for both (existing / proposed) single family and multi-family apartments. The proposed project is 100% affordable, which generally reduces traffic impacts as residents are inclined to have fewer cars.

A. Hydrology and Water Quality

Response: Hale Engineering prepared a "Preliminary Hydrology Report" November 2003. The County should also have the final "Hydrology Study" as the project was constructed along with the retention basin. The previous project which constructed most of the single-family homes also constructed a retention basin at the southwest corner Correll Road and Bloomfield Street. This basin was design to handle the run-off/hydrology from the proposed 16.2-acre tentative tract map. The proposed project will not require any additional bio-filtration or retention basins on the 16.2 acres. We anticipate impacts to hydrology and water quality to be less impactful as we less parking and hardscape that will be constructed.

B. School Facility Needs Analysis and Justification Study

Response: The proposed project will be required to pay school fees as mitigation. The project will have less than significant impacts to school. See attached letter.

C. Noise Impact Analysis

Response: A "Noise Impact Analysis Report" was prepared by Roma Environmental October 2003. The proposed project will be required to construct a 5 foot block wall along the boundary of the existing residential lots to the south. The project has prepared a new noise study for the project site. A separate noise analysis will be prepared for interior noise once the architectural is available. The proposed project be required to meet all Imperial County noise standards. Future residence will be notified about potential noise from nearby agricultural activities. The County has the original report on file, we would like to obtain copy.

2. Provide an Air Quality and Green House Gas Analysis for the project.

   Response: An Air quality report was prepared by Roma Environmental in December 2003. We have reviewed the proposed mitigation measures as outlined in the January 9, 2004 "Project Description and Summary of Mitigation Measures". The County has this report on file. We would like to understand why this report is being requested as fewer impacts are anticipated?

3. Please include the proposed project name (Miraluz) per your email dated December 9, 2020 under Project Description.

   Response: The project description has been rewritten to include the project name.

4. Attached please find letters from the following Departments and Agencies, contact with those agencies should be made to address their concerns:

   Response: Noted

   A. Imperial Irrigation District: Letter dated December 2, 2020

1. To initiate the process to obtain electrical service for phase 1 of the project (60 apartment units), the applicant should contact Joel Lopez, the IID Service Planner for the area, at 760-782-3444 or email Mr. Lopez at jflopez@iid.com.

   Response: We have received a will serve letter for the proposed Heber Meadows apartments phase 1 dated 11-23-2020. We have included this letter in the 2nd submittal.

2. Please note that electrical capacity is limited in the area. A circuit study may be required. Any improvements identified in the circuit study to allow electrical service to the development project shall be the financial responsibility of the applicant.

   Response: Noted and agree with the statement.

3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvement such as proposed new streets, driveways, parking lots, landscaping, water, sewer, storm drain or any other above ground or underground utilities will require an encroachment permit or encroachment agreement.

   Response: Noted and agree the project will be required to work with IID for design, encroachment permits and agreements.

4. In addition to IID's recorded easements, IID claims, at minimum, a prescriptive right of way to the toe of slope of all existing canals and drains…IID should be consulted prior to installation of any facility adjacent to IID's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.

   Response: Noted and agree project will be required to work with IID to avoid any impacts and be subject to mitigate depending on the circumstances.

5. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drain, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation….Any and all mitigation necessary as a result of the construction, relocation and/or upgrades of IID facilities is the responsibility of the project proponent.

Response: Noted and agree project will require identify and environmental impacts and mitigate such impacts depending on the circumstances.

B. Imperial County Agriculture Commissioners: Letter dated December 7, 2020
Our office ask that the applicate/developer contact our "Pest Detection and Eradication Division" if they decide to source the nursery stock from outside Imperial County. There are numerous quarantines in affect to safeguard the landscape and agricultural industry from exotic and invasive pest and disease. All plants coming into Imperial County are required by law to be held for inspection by our office prior to being planted, which included plant material from out of state.

Response: All project plant material provided used on site shall meet the requirements set forth in the Imperial County Agriculture Commissioner's letter dated Dec. 7, 2020. The contents of that letter have been provided on the landscape concept plans.

There are many quarantines which must be observed. The most complex is for the glassy-winged sharpshooter and detailed directions for compliance follow. However, there are a few other quarantines that you should be aware of and they are listed at the end of this letter.

Response: See comment above

C. Caltrans: Letter dated December 7, 2020

Caltrans has the following comments:

Hydrology and Drainage Studies

- Coordinate with Caltrans' Survey Branch to obtain SR-86 Right of Way (R/W) to be shown and labeled on all plans and maps containing SR-86.

  Response: All Caltrans and Public Right of ways are shown on the current plans.

- Coordinate with Caltrans Survey Branch to obtain SR-86 stationing, centerline, and alignment name to be shown and labeled on all plans containing SR-86.

  Response: All Caltrans stationing are shown on the current plans.

- Provide a detailed Hydrology and Hydraulics Study for the modification to SR-86 and proposed Pitzer intersection using the current Caltrans Highway Design Manual criteria.

Response: A Hydrology and Hydraulics Study has been prepared for Caltrans and County review.

- Provide copy of all records for all existing drainage features being affected by the proposed improvements. This includes, but is not limited to: Caltrans as-built plans, City/County Record drawings, permit documents, etc.

  Response: Information obtained has been included with the 2nd submittal

- Please provide hydraulic studies, drainage and grading plans to Caltrans for review.

  Response: Hydraulic, Drainage Study and Grading Plans have been included for review.

- Provide a pre and post-development hydraulics and hydrology study. Show drainage configurations and patterns.

  Response: Plans show drainage configurations and patterns.

- Provide drainage plan and details. Include detention basin details of inlets/outlet.

  Response: The plans show drainage and details, including detention basin along with inlets and outlets.

- Provide a contour grading plan with legible callouts and minimal building data. Show drainage patterns.

  Response: Grading Plan has been provided with call outs and drainage patterns.

- On all plans, show Caltrans' Right of Way (R/W)

  Response: Caltrans Right of Way (R/W) is shown on all plans

- Early Coordination with Caltrans is recommended.

  Response: Coordination and meetings are taking place.

Complete Streets and Mobility Network

Caltrans views all transportation improvements as opportunities to improve safety, access and mobility for all travelers in California and recognized

bicycle, pedestrian and transit modes as integral elements of the transportation system. Caltrans supports improved transit accommodation through the provision of Park and Ride facilities, improved bicycle and pedestrian access and safety improvements, signal prioritization for transit, bus on shoulders, ramps improvements, or other enhancements that promotes a complete and integrated transportation system. Early coordination with Caltrans, in locations that may affect both Caltrans and ~~the City of San Diego~~ Imperial County or other lead agency, is encouraged.

Land Use and Smart Growth

Caltrans recognizes there is a strong link between transportation and land use. Development can have a significant impact on traffic and congestion on State transportation facilities. In particular, the pattern of land use can affect both local vehicle miles traveled and the number of trips. Caltrans supports collaboration with local agencies to work toward a safe, functional, interconnected, multi-model transportation system integrated though applicable "smart growth" type land use planning and policies.

The ~~City~~ County should continue to coordinate with Caltrans to implement necessary improvements at intersection and interchanges where the agencies have joint jurisdiction, as well as coordinate with Caltrans as development proceeds and funds become available to ensure that the capacity of on-/off-ramps is adequate.

Response: We have coordinated with Imperial County regarding additional bicycle routes, pedestrian trails, park & ride facilities and bus stops. To date no additional facilities have been identified.

Environmental

Caltrans welcomes the opportunity to be a Responsible Agency under the California Environmental Quality Act (CEQA), as we have some discretionary authority of a portion of the project that is in Caltrans' R/W through the form on an encroachment permit process. We look forward to the coordination of our efforts to ensure that Caltrans can adopt the alternative and/or mitigation measures for our R/W. We would appreciate meeting with you to discuss the elements of the EIR that Caltrans will use for our subsequent environmental compliance.

Response: This project was originally approved as part of a larger project and currently has a mitigated negative declaration approved. The CEQA requirements for this intersection will be evaluated by Imperial County. Imperial County will be the lead and Caltrans will be involved in the review process.

An encroachment permit will be required and any work within the Caltrans' R/W prior to construction. As part of the encroachment permit process, the

applicant must provide approved final environmental documents for this project, corresponding technical studies, and necessary regulatory and resource agency permits. Specifically, CEQA determination or exemption. The supporting documents must address all environmental impacts within the Caltrans R/W and address any impacts from avoidance and/or mitigation measures.

Response: Imperial County will be the lead agency for the CEQA process.

We recommend that this project specifically identifies and assesses potential impacts caused by the project or impacts from mitigation efforts that occur within Caltrans R/W that included impacts to the natural environment, transportation infrastructure, and appurtenant featured (including but not limited to lighting, signs, guardrail, structures, drainage and slopes). Caltrans is interested in any additional mitigation measures indemnified for the MND.

Response: These items are being evaluated during the CEQA process.

Mitigation

Caltrans endeavors that any direct and cumulative impacts to the State Highway System be eliminated or reduced to a level of insignificance pursuant to California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) standards.

Response: These items are being evaluated during the CEQA process.

Mitigation measures to State facilities should be included in the TIS/TIA. Mitigation identified in the traffic study, subsequent environmental documents, and mitigation monitoring reports, should be coordinated with Caltrans to identify and implement the appropriate mitigation. This includes the actual implementation and collection of any "fair share" monies, as well as the appropriate timing of the mitigation. Mitigation improvements should be compatible with Caltrans concepts.

Response: The project will signalize SR-86 and Pitzer Road. No other mitigation will be required, including fair share contributions.

Mitigation measures for proposed intersection modifications are subject to the Caltrans Intersection Control Evaluation (ICE) policy (Traffic Operations Policy Directive 13-02). Alternative intersection design (s) will need to be considered in accordance with ICE policy. Please refer to the policy for more information and requirements (http://www.dot.ca.gov/trafficops/ice.html).

Response: An ICE report has been prepared for review by Caltrans and Imperial County.

Mitigation conditioned as part of a local agency's development approval for

improvements to State facilities can be implements either through a Cooperative Agreement between Caltrans and the lead agency, or by the project proponent entering into an agreement directly with Caltrans for the mitigation. When that occurs, Caltrans will negotiate and execute a Traffic Mitigation Agreement.

Right-of-Way

- For the roundabout concept at Pitzer and SR-86: Please consult the Highway Design Manual, Nation Cooperative Highway Research Program (NCHRP) 672 and NCHRP 836 to ensure appropriate design standards and practices are used for evaluating the roundabout.

  Response: Noted

- For the intersection concept: Per Highway Design Manual Index 302.1 and Index 307.2, shoulder widths should be 8 feet wide for multilane segments.

  Response: Noted

- Caltrans request that synchro files for the signalization at SR-111 at Heber Road and SR-111 at McCabe Road be submitted. Also, synchro files are needed for the proposed signalized intersection and roundabout concepts at SR-86 and Pitzer Road.

  Response: Files Provided

- All existing utilities need to be identified at SR-86 and Pitzer Road intersection and a utility base map needs to be developed. Contact the utility owners within your project area and request as-built plans from them (Imperial Irrigation District and AT&T)

  Response: Noted

- Per Business and professional Code 8771, perpetuation of survey monuments by a licensed land surveyor is required, if they are being destroyed by any construction.

  Response: Noted

- Any work performed within Caltrans R/W will require discretionary

review and approval by Caltrans and an encroachment permit will be required for any work within the Caltrans R/W prior to construction.

Response: Noted

Additional information regarding encroachment permits may be obtained by contacting the Caltrans Permit Office at 619-688-6158 or by visiting the website at http://www.dot.ca.gov/trafficops/ep/index.html. Early coordination with Caltrans is strongly advised for all encroachment permits.

Response: Noted

If you have any question, please contact Charlie Lecourtois, of the Caltrans Development Review Branch, at 619-985-4766 or by e-mail sent to Charlie.Lecourtois@dot.ca.gov.

Response: Noted

D. Imperial County Environmental Health Department (no comments) email dated 11-24-2020

Response: Mario Salinas stated Pertaining to TTM # 00992, Division of Environmental Heath does not have any comments at this time.

Contact with these Department/Agencies should be made to address their concerns. Additionally, we will forward you any copies of comments we received from other Departments/Agencies as we received them.

Response: Noted

Please provide the above requested ~~application~~ information to continue processing your project. Should you have any question, please do not hesitate to contact me at 442-265-1736, extension 1748 or via email at joehernandez@co.imperial.ca.us or Mariela Moran, extension 1747 via email @ marielamoran@co.imperial.ca.us if you need assistance.

Response: Noted

We have made the following revisions to the various maps.

Tentative Tract Map # 00992:

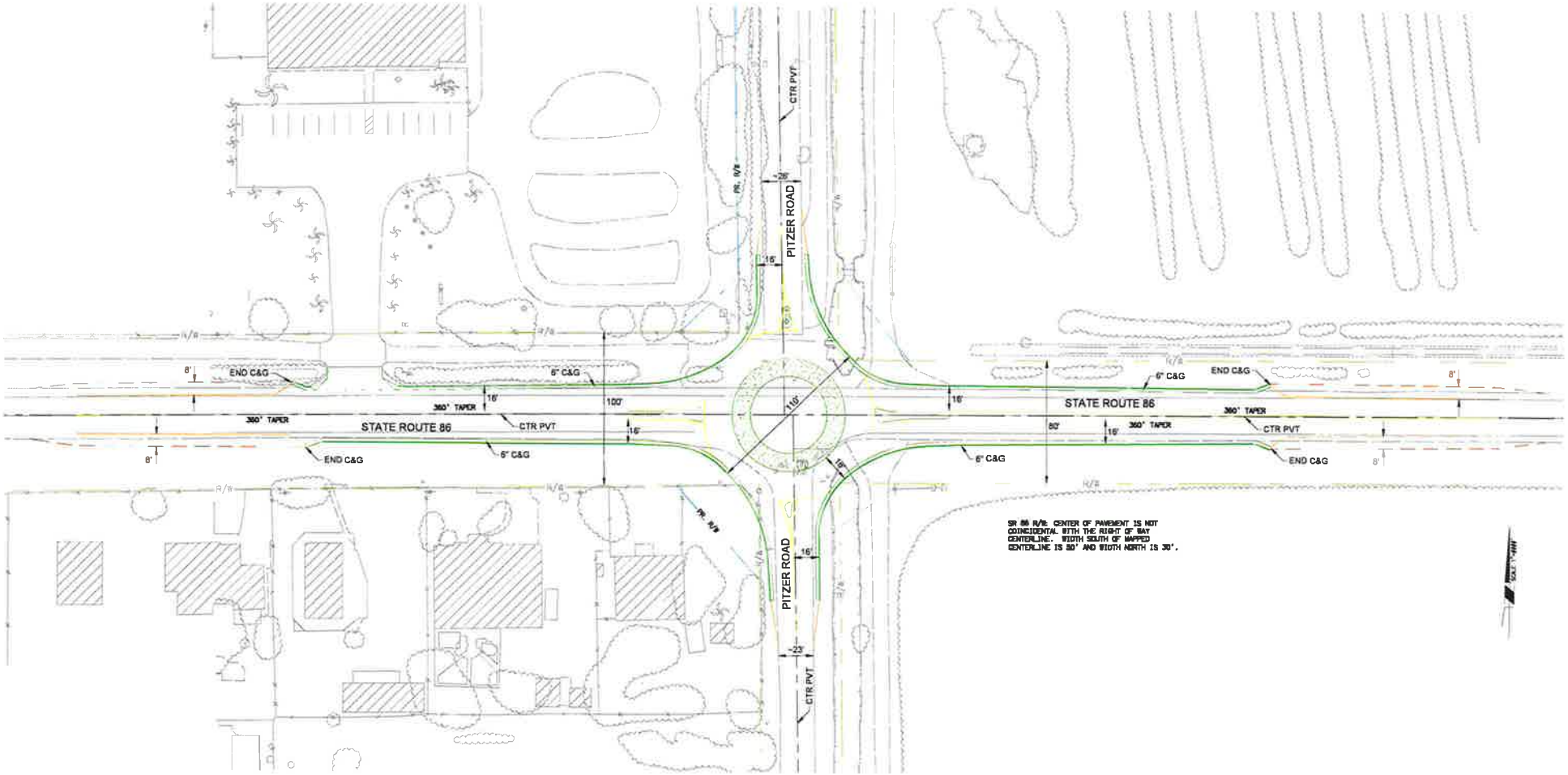
1. Added access easements to each parcel.
2. Added sewer and water connections to each parcel

Architectural Plan:

1. Added pitch Roof
2. Removed siding and replaced with colored stucco
3. Removed Patios and Balconies

Preliminary Landscape Plans:

1. Removed turf



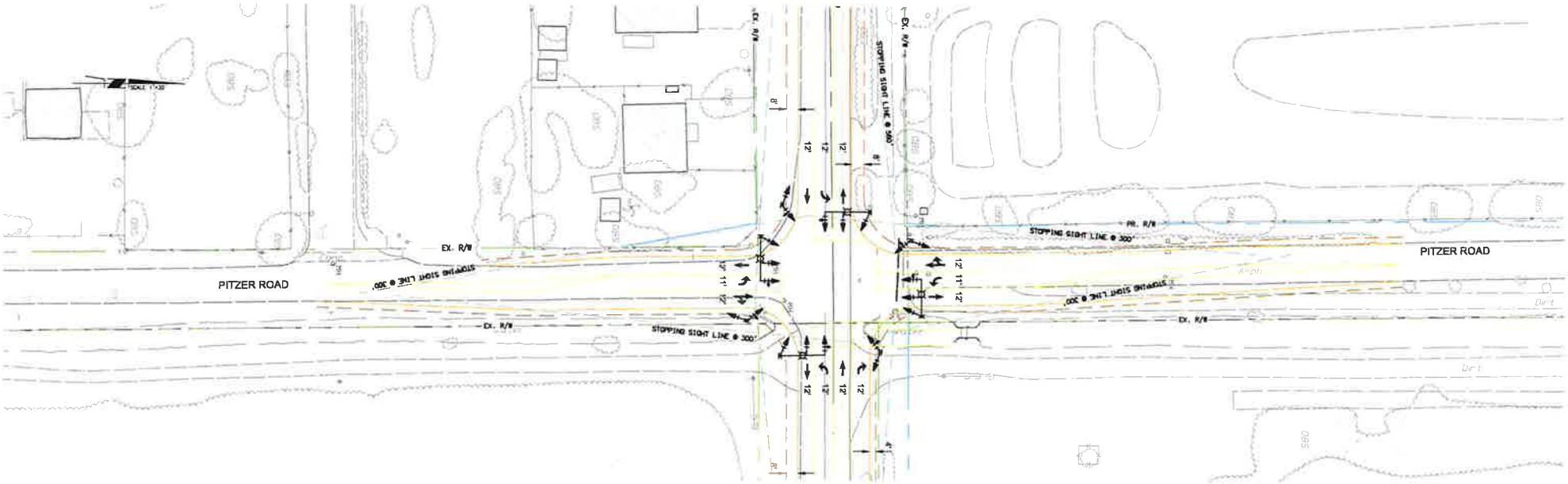
30 15 0 30 60 90

SCALE: 1" = 30'

STATE ROUTE 86 / PITZER
ROUNDABOUT CONCEPT
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT
DRAFT CONCEPT PLAN
JANUARY 18, 2021

STATE ROUTE 86 / PITZER
SIGNALIZED INTERSECTION WIDENING
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT

DRAFT CONCEPT PLAN
JANUARY 18, 2021



30 15 0 30 60 90
SCALE: 1"=30'

STATE ROUTE 86 / PITZER
SIGNALIZED INTERSECTION WIDENING
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT
DRAFT CONCEPT PLAN
JANUARY 18, 2021

Attachment
"Comment Letters"

California Department of Transportation

DISTRICT 11
4050 TAYLOR STREET, MS-240
SAN DIEGO, CA 92110
(619) 709-5152 | FAX (619) 688-4299 TTY 711
www.dot.ca.gov

December 15, 2021

11-IMP-86
PM 1.2
Miraluz Affordable Apartments
TTM #00992

Ms. Mariela Moran
Planner II
Imperial County Planning and Development Services
801 Main St. El
El Centro, CA 92243

Dear Ms. Moran:

Thank you for including the California Department of Transportation (Caltrans) in the review process for the second request for comments on the revised project description and environmental studies for the Miraluz Affordable Apartments located near State Route 86 (SR-86). The mission of Caltrans is to provide a safe and reliable transportation network that serves all people and respects the environment. The Local Development Review (LDR) Program reviews land use projects and plans to ensure consistency with our mission and state planning priorities.

Safety is one of Caltrans' strategic goals. Caltrans strives to make the year 2050 the first year without a single death or serious injury on California's roads. We are striving for more equitable outcomes for the transportation network's diverse users. To achieve these ambitious goals, we will pursue meaningful collaboration with our partners. We encourage the implementation of new technologies, innovations, and best practices that will enhance the safety on the transportation network. These pursuits are both ambitious and urgent, and their accomplishment involves a focused departure from the status quo as we continue to institutionalize safety in all our work.

Caltrans is committed to prioritizing projects that are equitable and provide meaningful benefits to historically underserved communities, to ultimately improve transportation accessibility and quality of life for people in the communities we serve.

We look forward to working with the County of Imperial in areas where the County and Caltrans have joint jurisdiction to improve the transportation network and connections between various modes of travel, with the goal of improving the experience of those who use the transportation system.

Caltrans has the following comments:

Traffic Engineering and Analysis

- For the intersection control evaluation (ICE), a benefit cost ratio between all intersection control alternatives must be provided.
- Approximate cost of utility relocation for all alternatives should be included, as part of the ICE study.
- For the ICE study the comparison between each alternative must be equivalent. For an example Table 8-1, the additional Right-of-Way (R/W) requirement should be in equal units for all alternatives.
- Provide signal traffic warrants for the signal alternative.
- Provide the Synchro files and other files used to analyze traffic for the project.

Design

Below are comments related to the proposed roadway improvements:

- Sight Distance Evaluation
    - Per the Highway Design Manual (HDM) Index 201.3, stopping sight distance is measured along the length of a roadway.
    - For the corner sight distance measurement for the proposed signalized intersection, refer to HDM Index 405.1(2)(b) and Figure 405.1 to calculate the sight triangles.
- Existing and proposed fixed objects should comply with Clear Recovery Zone and Minimum Horizontal Clearance standards found in HDM Index 309.1(2) and (3), respectively.
    - Examples of some of the existing fixed objects noticed during an online map review of the existing intersection include existing channel headwalls, elevation difference between the roadway and channel's water level, and existing utility poles. This is not a complete list of potential fixed objects for the project.
    - Proposals for any traffic safety devices along SR-86/Main Street, such as metal railing or concrete barriers, must be discussed with the Traffic Operations Division.
- For new or relocated utilities, please consult the Project Development Procedures Manual, Chapter 17, Encroachments and Utilities, to ensure

compliance with current standards.

Traffic Control Plan/Hauling

Caltrans has discretionary authority with respect to highways under its jurisdiction and may, upon application and if good cause appears, issue a special permit to operate or move a vehicle or combination of vehicles or special mobile equipment of a size or weight of vehicle or load exceeding the maximum limitations specified in the California Vehicle Code. The Caltrans Transportation Permits Branch is responsible for the issuance of these special transportation permits for oversize/overweight vehicles on the State Highway network. Additional information is provided online at: http://www.dot.ca.gov/trafficops/permits/index.html

A Traffic Control Plan is to be submitted to Caltrans District 11, including the interchanges at SR-86 and Pitzer Road, at least 30 days prior to the start of any construction. Traffic shall not be unreasonably delayed. The plan shall also outline suggested detours to use during closures, including routes and signage.

Potential impacts to the highway facilities (SR-86) and traveling public from the detour, demolition, and other construction activities should be discussed and addressed before work begins.

Environmental

It appears the concept plans are proposing modifications to the Imperial Irrigation District (IID) Daffodil Canal along SR-86 and Pitzer Road when we look at the overlay and compare them with the existing for both the roundabout and signalized intersection concept plans. We need to know a little more about ownership to understand what may be involved in rebuilding the Daffodil Canal. Are there any additional facts that might be shared about what we anticipate be required for the reconstruction of the canal undercrossing culvert?

Hazardous Waste

A hazardous waste concern for this project is aerially deposited lead (ADL). Elevated levels of ADL are common in the soil adjacent to State highways and can also be found underneath some existing road surfaces due to past construction activities. ADL is usually found within 30 feet of the edge of the pavement and within the top six inches of the soil. In some cases, the lead is as deep as two to three feet below the surface. The Department of Toxic Substances Control (DTSC) sets regulatory thresholds for lead in soil, based on risk assessment work performed by CalEPA's Office of Environmental Health Hazard

Assessment (OEHHA). It is the Permittee's responsibility to comply with the DTSC ADL requirements for roadway soil management.

Noise

The applicant must be informed that in accordance with 23 Code of Federal Regulations (CFR) 772, the Caltrans is not responsible for existing or future traffic noise impacts associated with the existing configuration of SR-86.

Broadband

Caltrans recognizes that teleworking and remote learning lessen the impacts of traffic on our roadways and surrounding communities. This reduces the amount of VMT and decreases the amount of greenhouse gas (GHG) emissions and other pollutants. The availability of affordable and reliable, high speed broadband is a key component in supporting travel demand management and reaching the State's transportation and climate action goals.

Materials Engineering

Once the preferred intersection alternative has been selected at SR-86 and Pitzer Road, please forward the proposed structural sections for review and approval. If hot mix asphalt will be used, we request for a PG 70-10 binder in this area.

Mitigation

Caltrans endeavors that any direct and cumulative impacts to the State Highway network be eliminated or reduced to a level of insignificance pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) standards.

Mitigation conditioned as part of a local agency's development approval for improvements to State facilities can be implemented either through a Cooperative Agreement between Caltrans and the lead agency, or by the project proponent entering into an agreement directly with Caltrans for the mitigation. When that occurs, Caltrans will negotiate and execute a Traffic Mitigation Agreement. If a proposed Cooperative agreement or Highway Improvement Agreement, or Traffic Mitigation Agreement or Maintenance Agreement already exists please provide it to Caltrans.

Electrical Systems

- Electrical plans for SR-86 & Pitzer Road intersection has two concepts shown, a roundabout and a signalized intersection, which concept is warranted and is going to be implemented? IID needs to be on board with either the conceptual design of the roundabout and/or the signalized intersection because they involve modifications to the Daffodil Canal along SR-86 and Pitzer Road.

- Please provide the completed electrical plans with the warranted concept for review.

Right-of-Way

Coordinate with Caltrans, if it is decided to move forward with the roundabout design since there will need to be property acquisitions to accommodate the roundabout. Also, R/W map updates would be needed along with setting new monuments for the new R/W.

Show all ownership information regarding the Daffodil Canal along SR-86 and Pitzer Road as a stipulation to complete the review. For your reference, please see attached the R/W deed for the Daffodil Canal.

Right-of-Way Utilities

Please identify all utilities within the project and provide a utility management matrix listing potential utility conflicts or relocations.

Heber Meadows Land Holdings LLC shall prepare and submit to Caltrans closure plans as part of the encroachment permit application. The plans shall require that closure or partial closure of SR-86 be at limited times, as to create the least possible inconvenience to the traveling public, and that signage be posted prior to the closure to alert drivers of the closure in accordance with Caltrans requirements. Traffic shall not be unreasonably delayed. The plan shall also outline suggested detours to use during the closures and traffic should include routes and signage.

The Highway Closure Plan, as part of the encroachment permit, should be submitted to Caltrans at least 30 days prior to initiating installation of the crossings. No work shall begin in Caltrans' R/W until an encroachment permit is approved.

Any work performed within Caltrans' R/W will require discretionary review and approval by Caltrans and an encroachment permit will be required for any work within Caltrans' R/W prior to construction. As part of the encroachment permit process, the applicant must provide an approved final environmental document including the CEQA determination addressing any environmental impacts with the Caltrans' R/W, and any corresponding technical studies.

Please see the following chapters in the Caltrans' manuals:

- Chapter 600 of the Encroachment Permits Manual for requirements regarding utilities and state R/W: https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/encroachment-permits/chapter-6-ada-a11y.pdf.

- Chapter 2-2.13 of the Plans Preparation Manual for requirements regarding utilities and state R/W: https://dot.ca.gov/-/media/dot-media/programs/design/documents/cadd/ppm-text-ch2-sect2-13-a11y.pdf.

- Chapter 17 of the Project Development Procedures Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/pdpm-chapter17-a11y.pdf.

Additional information regarding encroachment permits may be obtained by contacting the Caltrans Permits Office at (619) 688-6158 or emailing D11.Permits@dot.ca.gov or by visiting the website at https://dot.ca.gov/programs/traffic-operations/ep. Early coordination with Caltrans is strongly advised for all encroachment permits.

If you have any questions or concerns, please contact Charlie Lecourtois, LDR Coordinator, at (619) 985-4766 or by e-mail sent to Charlie.Lecourtois@dot.ca.gov.

Sincerely,

Maurice A. Eaton

MAURICE EATON
Branch Chief
Local Development Review

Attachment (SEC 27 Right of Way Deed 1961 03-09 BK 1073 PG 35 – Daffodil Canal)

IID-906

RIGHT-OF-WAY DEED

KNOW ALL MEN BY THESE PRESENTS: That THE IRVINE COMPANY, a corporation

for good and valuable consideration, the receipt of which is hereby acknowledged, grant__ to IMPERIAL IRRIGATION DISTRICT, its successors and assigns forever a right of way, described as follows, to wit:

That portion of Tract 48, described as the N. 1/2 of the W. 1/2 of Lot 1, as shown on Official Map No. 361, in License Survey Map Book 6 Page 32 of Official Records, County of Imperial, State of California lying west of a line which is parallel with and 35 feet east of the center line of the Daffodil Canal, as now constructed along the west side of said property.

Said parcel__ of land situated in Township 16 South, Range 14 East S. B. B. & M., County of Imperial, State of California. The Vendor may retain possession of the said right of way until such time as the District may desire the use thereof.

The purpose of said right of way is for the construction, maintenance and/or use of a _____ canal or canals, open and/or underground, telephone and/or electric power line or lines, overhead and/or underground as now exist, or as may hereafter be constructed, enlarged or otherwise changed. Any use of said right-of-way easement shall not determine or limit the extent of the said easement granted herein.

Together with all rights and privileges necessary to the full enjoyment thereof, including all necessary or convenient means of ingress and egress to and from said right of way.

It is expressly understood that the east boundary of said right of way shall be 35 feet east of the center line of that certain Daffodil Canal as now constructed along the west side of said above-described real estate.

Witness our hand & this _____ day of Feb 27, 1961, 19__.

Witness to Signature

THE IRVINE COMPANY, a corporation

By Robert W. Long /s/ Vice President

By Charles S. Wheeler /s/ Secretary

gkra

3/9/61

1073-35

4

Mariela Moran

From: Lp13boots <lp13boots@aol.com>
Sent: Saturday, October 30, 2021 12:59 PM
To: Rosa Soto; Valerie Grijalva; Carlos Ortiz; Sandra Mendivil; Margo Sanchez; Matt Dessert; Monica Soucier; Adam Crook; Esperanza Colio; Alphonso Andrade; Jorge Perez; Jeff Lamoure; Mario Salinas; Robert Menvielle; Robert Malek; Andrew Loper; John Gay; Carlos Yee; Guillermo Mendoza; Ray Loera - Sheriff; Benavidez, Robert; ceo@pioneersmuseum.net; Donald Vargas; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty; Eaton, Maurice A@DOT; Landrum, Beth A@DOT; Sanchez Rangel, Rogelio@DOT; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC; Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer; frankbrown6928@gmail.com; Quechan Indian Tribe; ljbirdsinger@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org
Cc: Mariela Moran; Carina Gomez; John Robb; Kimberly Noriega; Maria Scoville; Shannon Lizarraga
Subject: RE: TR#00992 Second Request for Comments

Follow Up Flag: Follow up
Flag Status: Completed

CAUTION: This email originated outside our organization; please use caution.

Any ground disturbance I will to see a native monitor on site for any artifacts that may be there.
Thank you

Sent from my Verizon, Samsung Galaxy smartphone
Chairwoman Gwendolyn Parada
La Posta Band of Mission Indians

-------- Original message --------
From: Rosa Soto <RosaSoto@co.imperial.ca.us>
Date: 10/29/21 2:07 PM (GMT-08:00)
To: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>, Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>, Sandra Mendivil <SandraMendivil@co.imperial.ca.us>, Margo Sanchez <MargoSanchez@co.imperial.ca.us>, Matt Dessert <MattDessert@co.imperial.ca.us>, Monica Soucier <MonicaSoucier@co.imperial.ca.us>, Adam Crook <AdamCrook@co.imperial.ca.us>, Esperanza Colio <EsperanzaColio@co.imperial.ca.us>, Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>, Jorge Perez <JorgePerez@co.imperial.ca.us>, Jeff Lamoure <JeffLamoure@co.imperial.ca.us>, Mario Salinas <MarioSalinas@co.imperial.ca.us>, Robert Menvielle

<RobertMenvielle@co.imperial.ca.us>, Robert Malek <RobertMalek@co.imperial.ca.us>, Andrew Loper <AndrewLoper@co.imperial.ca.us>, John Gay <JohnGay@co.imperial.ca.us>, Carlos Yee <CarlosYee@co.imperial.ca.us>, Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>, Ray Loera - Sheriff <rloera@icso.org>, "Benavidez, Robert" <RBenavidez@icso.org>, ceo@pioneersmuseum.net, Donald Vargas <dvargas@iid.com>, wandrus@cuhsd.net, jcruz@hesdk8.org, lfischer@heber.ca.gov, CHP Captain Scott Laverty <slaverty@chp.ca.gov>, "Eaton, Maurice A@DOT" <maurice.eaton@dot.ca.gov>, "Landrum, Beth A@DOT" <beth.landrum@dot.ca.gov>, "Sanchez Rangel, Rogelio@DOT" <roger.sanchez-rangel@dot.ca.gov>, Nadim.Shukry-Zeywar@waterboards.ca.gov, "Krug, Robert@DTSC" <Robert.Krug@dtsc.ca.gov>, Kai.Dunn@waterboards.ca.gov, steve.quartieri@parks.ca.gov, Magdalena Rodriguez <magdalena.rodriguez@wildlife.ca.gov>, leslie.hartzell@parks.ca.gov, julianne.polanco@parks.ca.gov, david.j.castanon@usace.army.mil, eduardo.t.demeza@usace.army.mil, hhaines@augustinetribe.com, marcuscuero@campo-nsn.gov, chairman@cit-nsn.gov, cocotcsec@cocopah.com, tashina.harper@crit-nsn.gov, wmicklin@leaningrock.net, Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>, frankbrown6928@gmail.com, Quechan Indian Tribe <tribalsecretary@quechantribe.com>, ljbirdsinger@aol.com, lp13boots@aol.com, Thomas.tortez@torresmartinez-nsn.gov, joseph.mirelez@torresmartinez-nsn.gov, katy.sanchez@nahc.ca.gov, cloyd@barona-nsn.gov, rgoff@campo-nsn.gov, michaelg@leaningrock.net, epinto@jiv-nsn.gov, lcumper@jiv-nsn.gov, jmiller@LPtribe.net, mesagrandeband@msn.com, allenl@sanpasqualtribe.org, ssilva@sycuan-nsn.gov, tmchair@torresmartinez.org
Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>, Carina Gomez <CarinaGomez@co.imperial.ca.us>, John Robb <JohnRobb@co.imperial.ca.us>, Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>, Maria Scoville <mariascoville@co.imperial.ca.us>, Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>, Rosa Soto <RosaSoto@co.imperial.ca.us>
Subject: RE: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached Geotechnical Report and Phase I Environmental Site Assessment studies for TR00992 Miraluz Project as they were not initially included in the Second Request for comments. Please note commenting period has been extended to **November 12, 2021 at 5:00 PM.**

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Rosa A. Soto

I.C. Planning & Development Services

801 Main St. El Centro, CA 92243

(442) 265-1736-P

(442) 265-1735-F

rosasoto@co.imperial.ca.us

The preceding e-mail message (including any attachments) contains information that may be confidential, be protected by the attorney-client or other applicable privileges, or constitute non-public information. It is intended to be conveyed only to the designated recipient(s). If you are not an intended recipient of this message, please notify the sender by replying to this message and then delete it from your system. Use, dissemination, distribution, or reproduction of this message by unintended recipients is not authorized and may be unlawful.

From: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Sent: Tuesday, October 19, 2021 11:59 AM
To: Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Adam Crook <AdamCrook@co.imperial.ca.us>; Esperanza Colio <EsperanzaColio@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Menvielle <RobertMenvielle@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Benavidez, Robert <RBenavidez@icso.org>; ceo@pioneersmuseum.net; Donald Vargas <dvargas@iid.com>; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty <slaverty@chp.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>; Landrum, Beth A@DOT <beth.landrum@dot.ca.gov>; Sanchez Rangel, Rogelio@DOT <roger.sanchez-rangel@dot.ca.gov>; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>; Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez <magdalena.rodriguez@wildlife.ca.gov>; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; frankbrown6928@gmail.com; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org
Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>
Subject: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached ***Second*** Request for Comments Packet for Tentative Tract Map #00992 . Comments are due by **November 3, 2021 at 5:00 PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments Packet is being sent to you via this email.

Per size of attachment please use the following link to view packet.

https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:9f5ed0ec-de96-4489-9270-61f9931ca007

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Valerie Grijalva

Office Assistant II

Planning and Development Services

801 Main Street

El Centro, CA 92243

Office: (442)265-1779

Fax: (442) 265-1735

IID

www.iid.com

A century of service.

Since 1911

November 3, 2021

Ms. Mariela Moran
Planner II
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Heber Meadows/Miraluz Affordable Apartments TTM #00992 - Additional Comments

Dear Ms. Moran:

In addition to the Imperial Irrigation District's comments submitted to you on this date, please be advised that the improvements to the intersection of SR86 (Heber Road) and Pitzer Road may impact IID's Daffodil Canal and will likely require the replacement of the existing old corrugated metal pipe crossing and lengthening it to mitigate the road improvements, which the applicant would be responsible to address environmentally and financially.

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

IID

www.iid.com

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Since 1911

November 3, 2021

Ms. Mariela Moran
Planner Ii
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Heber Meadows/Miraluz Affordable Apartments TTM #00992

Dear Ms. Moran:

On October 19, 2021, the Imperial Irrigation District received from the Imperial County Planning & Development Services Department, a second request for agency comments on Tentative Tract Map #00992. The applicant, Heber Meadows Landholding, LLC; proposes the subdivision of a parcel located at 185 Willowbrook Way, Heber, CA (APN 054-601-016-000) to create five (5) lots for the purpose of multi-family housing development as well as State Route 86 and Pitzer Road improvements. This request is due to the fact that the original conditions of approval for the project contained stipulations which weren't completed, such as the requirement to signalize the intersection of SR-86 and Pitzer Road, that with grant funding will now be built out completely, and the requirement to update certain reports since the project's original CEQA documentation was approved in 2004.

The IID has reviewed the application and in addition to the comments provided in the district letter dated December 2, 2020 (see attached letter), has the following observations:

1. IID energy facilities that will be impacted include:
    - HL1 92kV and the P 92kV transmission lines.
    - T-323 and T-324 7.2/12.5kV distribution circuits (impacted by improvements along SR-86 & Pitzer Road).
    - T-322 7.2/12.5kV distribution circuit (impacted by the multi-family housing project).

2. IID water facilities that may be impacted include the Central Drain No. 3D No. 1 and the Central Drain No. 3D. The Central Drain No. 3D No. 1 is located along the parcel's northern boundary. The Central Drain No 3D is located along the parcel's eastern boundary.

3. The applicant may not use IID's canal or drain banks to access the project site. Any abandonment of easements or facilities will be approved by IID based on systems (Irrigation, Drainage, Power, etc.) needs.

4. For safety purposes and to allow access for IID operation and maintenance activities, fencing should be installed at the boundary of IID's right of way. The project's fencing plan should consider IID's right-of-way.

5. To insure there are no impacts to IID's Central Drain No. 3D No. 1 or Central Drain No 3D, the project's design and fencing plans are to be submitted to IID Water Department Engineering Services Section prior to finalization for review. IID WDES Section can be contacted at (760) 339-9265 for additional information.

6. Should the proposed project require site access from Correll Road or Pitzer Road, an IID crossing and encroachment permit will be required. When new crossings or modifications to existing crossings are needed, the applicant will be responsible for the cost of these improvements and IID will design and construct them.

7. The applicant will be required to contact the IID Real Estate Section and request encroachment permits for the IID facilities being impacted and provide approved improvement plans, profile drawings of the project, including the SR-86 and Pitzer Road improvements and signalization work for review and comment.

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

IID

www.iid.com

A century of service.

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December 2, 2020

Mr. Joe Hernandez
Planner IV
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Tentative Tract Map No. 00992

Dear Mr. Hernandez:

On November 20, 2020, the Imperial Irrigation District received from the Imperial County Planning & Development Services Dept. a request for agency comments on Tentative Tract Map no. 00992. The applicant proposes to create five lots for multi-family housing. The parcel to be subdivided is located at 185 Willowbrook Way in Heber, California (APN 054-601-016-000).

The Imperial Irrigation District has reviewed the information and has the following comments:

1. To initiate the process to obtain electric service for phase 1 of the project (60 apartment units), the applicant should be advised to contact Joel Lopez, the IID Service Planner for the area, at (760) 482-3444 or e-mail Mr. Lopez at jflopez@iid.com. In addition to submitting a formal application (available for download at the district website at http://www.iid.com/home/showdocument?id=12923), the applicant will be required to submit a complete set of approved plans, including any photo-voltaic installation drawings for the PV component of the project, (hard copy and CAD files); project schedule, estimated in-service date, electrical loads, panel size, panel locations, voltages, accessibility to operate and maintain IID equipment, and the applicable fees, permits, easements and environmental compliance documentation pertaining to the provision of electrical service to the project. The applicant shall be responsible for all costs and mitigation measures related to providing electrical service to the project.

2. Please note that electrical capacity is limited in the area. A circuit study may be required. Any improvements identified in the circuit study to allow electrical service to the development project shall be the financial responsibility of the applicant.

3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). The IID encroachment permit application and instructions are available for download at the district website https://www.iid.com/about-iid/department-directory/real-estate. The IID Real Estate

Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements.

4. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IID's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.

5. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. **Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.**

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Sandra Blain – Deputy Manager, Energy Dept.,
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

From: Ana L Gomez
To: Mariela Moran
Cc: Sandra Mendivil
Subject: TR#00992 No Comments
Date: Friday, November 12, 2021 1:02:47 PM
Attachments: Landmark Geotechnical Report 12-23-2020.pdf
image001.png
Phase I ESA- Miraluz-Chelsea- 10.28.2021 (002).pdf

Good afternoon Mariela,

We don't have any comments on TR#00992 Miraluz Project

Have a good day,
Ana Gomez

From: Sandra Mendivil <SandraMendivil@co.imperial.ca.us>
Sent: Wednesday, November 3, 2021 2:14 PM
To: Ana L Gomez <analgomez@co.imperial.ca.us>
Subject: FW: TR#00992 Second Request for Comments

FYI

Sandra Mendivil

From: Rosa Soto <RosaSoto@co.imperial.ca.us>
Sent: Friday, October 29, 2021 2:07 PM
To: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Adam Crook <AdamCrook@co.imperial.ca.us>; Esperanza Colio <EsperanzaColio@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Menvielle <RobertMenvielle@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Benavidez, Robert <RBenavidez@icso.org>; ceo@pioneersmuseum.net; Donald Vargas <dvargas@iid.com>; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty <slaverty@chp.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>; Landrum, Beth A@DOT <beth.landrum@dot.ca.gov>; Sanchez Rangel, Rogelio@DOT <roger.sanchez-rangel@dot.ca.gov>; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>;

Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez <magdalena.rodriguez@wildlife.ca.gov>; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; frankbrown6928@gmail.com; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org

Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>

Subject: RE: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached Geotechnical Report and Phase I Environmental Site Assessment studies for TR00992 Miraluz Project as they were not initially included in the Second Request for comments. Please note commenting period has been extended to **November 12, 2021 at 5:00 PM.** Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Rosa A. Soto
I.C. Planning & Development Services
801 Main St. El Centro, CA 92243
(442) 265-1736-P
(442) 265-1735-F
rosasoto@co.imperial.ca.us

The preceding e-mail message (including any attachments) contains information that may be confidential, be protected by the attorney-client or other applicable privileges, or constitute non-public information. It is intended to be conveyed only to the designated recipient(s). If you are not an intended recipient of this message, please notify the sender by replying to this message and then delete it from your system. Use, dissemination, distribution, or reproduction of this message by unintended recipients is not authorized and may be unlawful.

From: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Sent: Tuesday, October 19, 2021 11:59 AM
To: Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil

<SandraMendivil@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Adam Crook <AdamCrook@co.imperial.ca.us>; Esperanza Colio <EsperanzaColio@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Menvielle <RobertMenvielle@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Benavidez, Robert <RBenavidez@icso.org>; ceo@pioneersmuseum.net; Donald Vargas <dvargas@iid.com>; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty <slaverty@chp.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>; Landrum, Beth A@DOT <beth.landrum@dot.ca.gov>; Sanchez Rangel, Rogelio@DOT <roger.sanchez-rangel@dot.ca.gov>; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>; Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez <magdalena.rodriguez@wildlife.ca.gov>; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; frankbrown6928@gmail.com; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org

Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>

Subject: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached ***Second*** Request for Comments Packet for Tentative Tract Map #00992 . Comments are due by **November 3, 2021 at 5:00 PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments Packet is being sent to you via this email.

Per size of attachment please use the following link to view packet.

https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:9f5ed0ec-de96-4489-9270-61f9931ca007

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your

comment letters to icpdscommentletters@co.imperial.ca.us
Thank you,

Valerie Grijalva
Office Assistant II
Planning and Development Services
801 Main Street
El Centro, CA 92243
Office: (442)265-1779
Fax: (442) 265-1735

Imperial County Planning & Development Services
Planning / Building

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OCT 20 2021

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Jim Minnick
DIRECTOR

October 19, 2021
REQUEST FOR REVIEW AND COMMENTS

The attached project and materials are being sent to you for your review and as an early notification that the following project is being requested and being processed by the Imperial County's Planning & Development Services Department. Please review the proposed project based on your agency/department's area of interest, expertise, and/or jurisdiction.

To:

County Agencies

- ☒ County Counsel – Adam Crook
- ☒ County Executive Office – Esperanza Colio Warren
- ☒ IC Historical Society – Lynn Housouer
- ☒ APCD – Matt Dessert / Monica Soucier
- ☒ Public Works – John Gay / Guillermo Mendoza / Carlos Yee
- ☒ CHP – Scott Laverty
- ☒ Ag. Commissioner – Carlos Ortiz / Sandra Mendivil Margo Sanchez
- ☒ IC Fire/OES Office – Robert Malek / Andrew Loper
- ☒ IC Sheriff's Office – Ray Loera / Robert Benavidez
- ☒ EHS Office – Jeff Lamoure/ Jorge Perez/ Mario Salinas/Vanessa R. Martinez/Alphonso Andrade
- ☒ IC Assessor's Office – Robert Menvielle
- ☒ Certified Unified Program Agency – Robert Krug
- ☒ IID Environmental – Donald Vargas
- ☒ Caltrans District 11 – Maurice Eaton / Beth Landrum / Roger Sanchez
- ☒ CA Regional Water Quality Control Board – Kal Dunn
- ☒ Dept. US Fish & Wildlife – Magdalena Rodriguez

State Agencies/Other

- ☒ Ewiiaapaayp Tribal Office –Will Micklin
- ☒ Campo Band of Mission Indians –Marcus Cuero
- ☒ Chemehuevi Reservation –Charles Wood
- ☒ Colorado River Indian Tribe –Dennis Patch
- ☒ Augustine Band of Cahuilla Mission Indians – Amanda Vance/ Karen Kupcha
- ☒ Kumeyaay Cultural Repatriation Committee
- ☒ Fort Yuma-Quechan Indian Tribe –H. Jill McCormick/Jordan D. Joaquin
- ☒ Inter-Tribal Cultural Resource Protection Council – Frank Brown
- ☒ Torres-Martinez Indian Tribe –Joseph Mirelez
- ☒ Manzanita Band of Kumeyaay Nation –Angela Elliot Santos
- ☒ La Posta Band of Mission Indians –Gwendolyn Parada
- ☒ Native American Heritage Commission –Katy Sanchez
- ☒ Torres-Martinez Desert Cahuilla Indians –Thomas Torlez
- ☒ Barona Group of the Capitan Grande – Edwin Romero
- ☒ Inaja-Cosmit Band of Indians – Rebecca Osuna
- ☒ Viejas Band of Kumeyaay Indians – John Christman

Cities/Other

- ☒ Cocopah Indian Tribe –Sherry Cordova
- ☒ Army Corps of Engineers – David Castanon
- ☒ Central Union High School – Ward Andrus
- ☒ Dept. of Parks & Recreation – Leslie Hartzell
- ☒ Heber Union Elementary School District – Juan Cruz
- ☒ Heber Public Utility District – Laura Fisher
- ☒ Sycuan Band of the Kumeyaay Nation – Cody Martinez
- ☒ Kwaaymii Laguna Band of Mission Indians – Carmen Lucas
- ☒ Lipay Nation of Santa Ysabel – Virgil Perez
- ☒ California State Park/Ocotillo Wells District – Steve Quartieri
- ☒ State Historic Preservation Officer – Julianne Polanco
- ☒ Mesa Grande Band of Diegueno Mission Indians – Michael Linton
- ☒ Army Corps of Engineers – Eduardo Torrez-De Meza
- ☒ Campo Band of Diegueno Mission Indians – Ralph Goff
- ☒ Jamul Indian Village – Erica Pinto/ Lisa Crumper
- ☒ San Pasqual Band of the Kumeyaay Nation – Allen Lawson

From:	Case Planner Mariela Moran, Planner II (442) 265-1736 Ext.1747, E-mail at ICPDSCommentLetters@co.imperial.ca.us
Project ID:	Tentative Tract Map #00992 – APN 054-601-016-000
Project Location:	185 Willowbrook Way, Heber, CA 92249.
Project Description:	The applicants is proposing to create five (5) lots for multi-family housing, and State Route 86 and Pitzer Road Improvements. **Second Request** of comments to include **REVISED** project description and environmental studies.
Applicants:	David Davis on behalf of Heber Meadows Land Holding LLC, 6339 Paseo Del Lago, Carlsbad, CA 92011
Comments due by:	**November 3, 2021** **EEC Meeting:** **TBD**

COMMENTS: *(attach a separate sheet if necessary)* (If no comments, please state below and mail, fax, or e-mail this sheet to Case Planner)

NO COMMENTS

Name: Ana Gomez Signature: Title: Ag. Biologist

Date: 10/19/2021 Telephone No.: 442-265-1500 E-mail: ana.lgomez@co.imperial.ca.us

V:\IMMIS\AllUsers\APN\054\601\016\TR00992\TR00992 - Second Request for Comment.docx

150 SOUTH NINTH STREET
EL CENTRO, CA 92243-2860

TELEPHONE: (442) 265-1800
FAX: (442) 265-1799

AIR POLLUTION CONTROL DISTRICT

RECEIVED
NOV 15 2021
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

November 12, 2021

Jim Minnick
Planning & Development Services Director
801 Main Street
El Centro, CA 92243

SUBJECT: **Tentative Tract Map #00992 – APN 054-601-016-000**

Dear Mr. Minnick:

The Imperial County Air Pollution Control District ("Air District") appreciates the opportunity to review and comment on the project proposal for Tentative Tract Map #00992 – APN 054-601-016-000 also referred to as the Heber Meadows/Miraluz Affordable Housing Project. The proposed project would create five lots and construct affordable multi-family housing, in the form of low-rise apartments. The project also includes improvements to the intersection of State Route 86 and Pitzer Road.

The Air District reviewed the Project Proposal for consistency with the Imperial County California Environmental Quality Act (CEQA) Handbook ("Handbook").

The Air Quality Report concludes that the Air District's operational and construction emission threshold limits will not be exceeded using the values in tables 5-3 and 5-4, however, the emission values provided in these tables were not corroborated in the CalEEMod report included in Appendix A. In particular, the Construction Particulate Matter values were much higher in the CalEEMod report. Certain inputs entered into the CalEEMod also undermine the validity of the analysis, for example, the "CalEEMod 1.3 User Entered Comments & Non-Default Data" indicates that the "Road Dust" was changed from the default value of 50% to 100%. This is not consistent with the Air District's guidance for modeling. All proposed changes from default CalEEMod values should first be discussed with and approved by the Air District.

However, the Handbook states "CEQA analyses for construction particulate matter impacts should be qualitative as opposed to quantitative." Taking into account the mitigation measures listed in Sections AQ-1a and AQ-1b of the Air Quality Report, the Air District found the mitigation

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measures consistent with those listed in the Handbook and sufficient for a project of this nature to maintain Tier 1 "less than significant" impact as defined in the Handbook, even without the support of the CalEEMod Report.

The Project is sited on the Heber Meadows Tract Map #956 Subdivision, which was first approved by the Board of Supervisors on August 3, 2004. Since that date the Air District has updated its rules and would suggest a review of applicable rules. Updated rules of particular importance to the project would include RULE 400.6 NATURAL GAS-FIRED WATER HEATERS and RULE 428 WOOD BURNING APPLIANCES.

The Air District requests, for its records, copies of all finalized maps for this project.

Respectfully,

Ismael Garcia
APC Environmental Coordinator I

Monica N. Soucier
APC Division Manager

Valerie Grijalva

From: Lecourtois, Charlie@DOT <Charlie.Lecourtois@dot.ca.gov>
Sent: Monday, November 8, 2021 9:04 AM
To: Mariela Moran
Cc: Valerie Grijalva; Speerstra, Savannah@DOT; Eaton, Maurice A@DOT
Subject: RE: TR#00992 Second Request for Comments

CAUTION: This email originated outside our organization; please use caution.

Good Morning Mariela,

It has come to my attention that some of our functional unit reviewers are not able to provide comments by November 26 due to their work loads. Are we able to get a time extension until December 17, 2021, to finalize our comments on this project?

Thank you in advance for your attention to this email.

Respectfully,

Charlie Lecourtois
Transportation Planner
Caltrans District 11 LD-IGR Branch
4050 Taylor Street., MS 240
San Diego, CA 92110
Charlie.Lecourtois@DOT.ca.gov
Cell: (619) 985-4766
(Currently Teleworking, M-F, 8-5)

RECEIVED
NOV 08 2021
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

From: Lecourtois, Charlie@DOT
Sent: Thursday, October 28, 2021 2:59 PM
To: Mariela Moran <MarielaMoran@co.imperial.ca.us>
Cc: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Speerstra, Savannah@DOT <Savannah.Speerstra@dot.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>
Subject: RE: TR#00992 Second Request for Comments

Hello Mariela,

Thank you very much for sending us the Geotechnical Report that was prepared for this project and for granting us the time extension. Your assistance is greatly appreciated.

Have a nice day!

Respectfully,

Charlie Lecourtois
Transportation Planner
Caltrans District 11 LD-IGR Branch
4050 Taylor Street., MS 240
San Diego, CA 92110
Charlie.Lecourtois@DOT.ca.gov
Cell: (619) 985-4766
(Currently Teleworking, M-F, 8-5)

From: Mariela Moran <MarielaMoran@co.imperial.ca.us>
Sent: Thursday, October 28, 2021 1:37 PM
To: Lecourtois, Charlie@DOT <Charlie.Lecourtois@dot.ca.gov>
Cc: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Speerstra, Savannah@DOT <Savannah.Speerstra@dot.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>
Subject: RE: TR#00992 Second Request for Comments

EXTERNAL EMAIL. Links/attachments may not be safe.

Good afternoon Mr. Lecourtois,

Please find attached Geotechnical Report (December 2020), additionally per your request, please provide comments by November 26, 2021. Thank you for reviewing the project.

Should you have any questions please let us know.

From: Lecourtois, Charlie@DOT <Charlie.Lecourtois@dot.ca.gov>
Sent: Wednesday, October 27, 2021 4:58 PM
To: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Speerstra, Savannah@DOT <Savannah.Speerstra@dot.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>
Subject: RE: TR#00992 Second Request for Comments

CAUTION: This email originated outside our organization; please use caution.

Good Afternoon Valerie,

The application TR#00992 you provided talks about a Geotechnical Report (December 2020) that was prepared by Landmark Consultants Inc., on page 4/679. After further review of the submittal package I was not able to find the Geotechnical Report included. Could you please send over a copy to us as soon as possible? Our Geotechnical Engineers will need a copy of this report for their analysis. This may delay Caltrans providing comments by the response date.

Also we cannot provide a review at this time on the Preliminary Hydrology Study (prepared - 3/24/2021). It will have to be done at a different time. Right now our Hydraulics Branch is not

able to review the Preliminary Hydrology Study due to their work load until after November 16. Are we able to get an extension until November 26 to finalize our comments on the Preliminary Hydrology Study and the Geotechnical Report?

Respectfully,

Charlie Lecourtois
Transportation Planner
Caltrans District 11 LD-IGR Branch
4050 Taylor Street., MS 240
San Diego, CA 92110
Charlie.Lecourtois@DOT.ca.gov
Cell: (619) 985-4766
(Currently Teleworking, M-F, 8-5)

From: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Sent: Tuesday, October 19, 2021 11:59 AM
To: Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Adam Crook <AdamCrook@co.imperial.ca.us>; Esperanza Colio <EsperanzaColio@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Menvielle <RobertMenvielle@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Benavidez, Robert <RBenavidez@icso.org>; ceo@pioneersmuseum.net; Donald Vargas <dvargas@iid.com>; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; Laverty, Scott@CHP <SLaverty@chp.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>; Landrum, Beth A@DOT <beth.landrum@dot.ca.gov>; Sanchez Rangel, Rogelio@DOT <roger.sanchez-rangel@dot.ca.gov>; Shukry-Zeywar, Nadim@Waterboards <Nadim.Shukry-Zeywar@waterboards.ca.gov>; Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>; Dunn, Kai@Waterboards <Kai.Dunn@waterboards.ca.gov>; Quartieri, Steve@Parks <Steve.Quartieri@parks.ca.gov>; Rodriguez, Magdalena@Wildlife <Magdalena.Rodriguez@wildlife.ca.gov>; Hartzell, Leslie L.@Parks <Leslie.Hartzell@parks.ca.gov>; Polanco, Julianne@Parks <Julianne.Polanco@parks.ca.gov>; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; frankbrown6928@gmail.com; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; Sanchez, Katy@NAHC <Katy.Sanchez@nahc.ca.gov>; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org
Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>
Subject: TR#00992 Second Request for Comments

EXTERNAL EMAIL. Links/attachments may not be safe.

Good Afternoon,

Please see attached ***Second*** Request for Comments Packet for Tentative Tract Map #00992 . Comments are due by **November 3, 2021 at 5:00 PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments Packet is being sent to you via this email.

Per size of attachment please use the following link to view packet.

https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:9f5ed0ec-de96-4489-9270-61f9931ca007

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Valerie Grijalva
Office Assistant II
Planning and Development Services
801 Main Street
El Centro, CA 92243
Office: (442)265-1779
Fax: (442) 265-1735

Heber Public Utility District

1078 Dogwood Rd., Suite 103, P.O. Box H
Heber, CA 92249
TEL. (760) 482-2440 FAX (760) 353-9951
www.heber.ca.gov

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NOV 03 2021

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

November 3, 2021

Mr. Jim Minnick, Director
Imperial County Planning and Development Services
801 Main Street
El Centro, CA 92243

Re: Tentative Map Number 00992 – Heber Meadows Subdivision Lot D at the southwest corner of Correll and Pitzer Roads

Dear Mr. Minnick:

Thank you for allowing Heber Public Utility District (HPUD) to provide comments regarding Tentative Map Number 00992 which is located at the southwest corner of Correll and Pitzer Roads within the boundary of the HPUD's service area. Additional information was provided by the Developer/Applicant in terms of an updated Tentative Tract Map illustrating proposed water, wastewater, and stormwater drainage systems. The Developer/Applicant also provided responses to HPUD's comment letter dated December 7, 2020. HPUD's requirements for the project's domestic water, sanitary sewer, stormwater drainage services continue to remain the same with some changes based on information provided by the Developer/Applicant. Revisions are noted in **red, bold** text and strikethroughs.

1. **Domestic Water**

   Parcels 1 through 5

   1.1. ~~It is to be noted there was not water pipeline schematic layout illustrated on the Tentative Map. Water pipeline conditions are therefore presented without the benefit of the developer's water pipeline conceptual layout.~~ **A water layout schematic was included with the revised Tentative Map but it did not include the water pipeline layout for lots 3 and 5.** A water pipeline schematic plan configuration shall be approved by the HPUD Engineer prior to the approval of the first parcel's improvement plans. **See comment number 1.11 regarding this issue.**

   1.2. Provide a water meter service connection the same size as the water service line for each apartment ~~unit~~ **building** within each Parcels 1 through 5 building. A total of ~~sixty (60)~~ **six (6)** water meter service connections shall be required for each parcel. A total of ~~three hundred (300)~~ **thirty (30)** water meter service connections shall be required at full build out. The size of the water service line to each apartment unit shall be determined by the

Architect/Mechanical Engineer completing the building design. The water meter service shall comply with HPUD Standard Details and Specifications.

1.3. The domestic water services for each building shall be required to have a backflow prevention assembly. The backflow prevention assembly shall be in conformance with HPUD Standard Details and Specifications. It shall be acceptable to provide a backflow preventer on the larger diameter water pipelines upstream of the water meter service connections. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.4. A minimum of one (1) irrigation water meter service connection shall be provided for the open space area of each parcel. The size of the irrigation water meter shall be the same size as the irrigation pipeline downstream of the meter. The water meter service shall be in conformance with HPUD Standard Details and Specifications. A landscape architect shall determine the size of the irrigation pipelines and irrigation pipeline size downstream of the water meter servicing the open space areas. There shall be a minimum of five (5) irrigation water services for the entire 5 parcel development at full buildout. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.5. Each irrigation water service shall be required to have a backflow prevention assembly downstream of the irrigation meter. The backflow prevention assembly shall be in conformance with HPUD Standard Details and Specifications. The size of the backflow prevention assembly downstream of the meter shall be the same size as the irrigation service line downstream of the meter and backflow preventer. A minimum of (1) backflow preventer shall be required for each Parcel's irrigation water service. A minimum of (5) irrigation backflow assemblies shall be required for the entire 5 parcel development at full buildout. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.6. A water meter service connection shall be required for each parcel's community building. A total of one (1) water meter service connection shall be required for each parcel. A total of five (5) water meter service connections shall be required for the entire 5 parcel development at full build out. The size of the water service line to each community building shall be determined by the Architect/Mechanical Engineer completing the community building design. The water meter service shall comply with HPUD Standard Details and Specifications. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.7. Each community building water service shall be required to have a backflow prevention assembly downstream of the water meter. The backflow prevention assembly shall be in conformance with HPUD Standard Details and Specifications. The size of the backflow

prevention assembly downstream of the meter shall be the same size as the community service building domestic service line. A total of one (1) backflow preventer shall be required for the community building domestic water service for each Parcel. A total of five (5) backflow assemblies shall be required for the entire 5 parcel development at full buildout. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.8. If a swimming pool is included for each Parcel of the proposed development, the swimming pool shall be provided with a dedicated water meter service connection. The water meter service shall comply with HPUD Standard Details and Specifications. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.9. If a swimming pool is included for each Parcel then a backflow prevention assembly shall be required downstream of the swimming pool water meter. The backflow prevention assembly shall be in conformance with HPUD Standard Details and Specifications. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.10. A fire line shall be extended to each building within each parcel. A reduced pressure detector assemblies (RPDA) backflow assembly shall be installed downstream of the fire line connection to the HPUD water main. A fire department connection (FDC) shall be placed down stream of the RPDA backflow assembly. The size of the fire line shall be determined by the Fire Systems Engineer designing the fire sprinkler system for each building. The FDC location and distance relative to the nearest fire hydrant shall be determined by the Imperial County Deputy Fire Marshal. The Imperial County Deputy Fire Marshal is to review and approve the improvement plans during the project design phase. The RPDA and FDC drawing detail shall be approved by the HPUD Engineer and Imperial County Deputy Fire Marshal. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.11. **The revised Tentative Map 00992 date 6/23/2021 does not illustrate the water pipeline routing through lots 3 and 5. All required valves are not illustrated on the revised Tentative Map. The following Condition of Approval is to remain a requirement project.**

A minimum 12 inch AWWA C-900, DR 18 PVC, water main shall extend through Parcel 1. The 12 inch AWWA C-900, DR 18 PVC water pipeline shall connect to the HPUD water pipeline in Bloomfield Drive and loop through Lot A (Willowbrook Place) connecting to the HPUD water pipeline in Correll Road. Valves shall be placed at the pipeline connection point at Bloomfield Drive and Correll Road. The exact routing of the pipeline will be determined during the preparation of the improvement plans and approved by the HPUD Engineer. The water pipeline shall be constructed in conformance with the HPUD Standard Details and Specifications.

A minimum 12 inch AWWA C-900, DR 18 PVC water main shall extend through the remaining Parcels 2 through 5. The water pipeline routing was not illustrated on Tentative Parcel Map 00992. The 12 inch AWWA C-900, DR 18 PVC watermain extending through each parcel shall by extension, loop to at least two (2) existing HPUD water mains; ie loop and connect to the existing water pipelines in Bloomfield Street and Correll Road; Correll Road and Pitzer Drive, etc. The 12 inch AWWA C-900, DR 18 PVC water pipeline shall interconnect between the five parcels and upon completion connect to the existing water pipelines in Bloomfield Street, Correll Road and Pitzer Road. The 12 inch AWWA C-900, DR 18 PVC water pipeline extending through Parcel 5 shall connect to the existing water pipeline along Pitzer Road. The exact water pipeline routing through all Parcels is to be approved by the HPUD Engineer prior to the approval of the first developed parcel's improvement plans. The location of valves, fire hydrants and water services along the 12 inch pipeline shall be determined and approved by the HPUD Engineer.

1.12. **The revised Tentative Map does not illustrate three hydrants on every lot. The following standards is required for the project.** Commercial fire hydrant assemblies in conformance with HPUD Standard Details and Specifications shall be placed along the 12 inch AWWA C-900, DR 18 pvc water pipeline extending through Lots 1 through 5. A minimum of three (3) commercial fire hydrants shall be installed in within the boundaries of each lot. The proximity and minimum distance of the commercial fire hydrants to the FDCs shall be reviewed and approved by the Imperial County Deputy Fire Marshall.

1.13. All water facilities shall be satisfactorily hydrostatically tested and disinfected in conformance with HPUD Standard Details and Specifications prior to placing the water system in service. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.14. All water facilities constructed to provide water service to Parcels 1 through 5 shall comply with HPUD Standard Details and Specifications. The water system improvement plans for each phased improvement are to be reviewed and approved by the HPUD Engineer prior to the approval of the Improvement Plans by the County of Imperial. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.15. The developer shall engage a California Licensed Land Surveyor or California Civil Engineer authorized to perform Surveys to prepare a 15 foot wide easement legal description and plat drawing in favor of HPUD along the length of the water pipeline within Parcels 1 through 5. The easement location shall be illustrated on the Improvement Plans. The water meters and fire hydrants shall be included within the easement area. For clarification purposes, HPUD shall be responsible to operate and maintain the branch pipelines, water meters and fire hydrants extending and located within parcels 1 through 5. The developer will be responsible to operate and maintain the service lines downstream of the water meters and the backflow

preventers. The developer will be responsible to operate and maintain the fire lines from the HPUD water mains to the apartment buildings and community building including the reduced pressure detector assemblies (RPDA) backflow assemblies and fire department connections (FDC). **Not all easements are illustrated on the revised Tentative Map. This Condition of Approval remains a requirement for the project.**

1.16. The developer shall enter into a maintenance agreement with HPUD so that the property owner will be responsible for testing and maintaining the apartment building, irrigation system, community building (and swimming pool if applicable) domestic water service backflow preventers. Also to be included are the fire line reduced pressure detection assemblies. The backflow preventer testing is to be completed by an American Water Works Association or American Backflow Prevention Association certified tester on an annual basis. The testing results are to be forwarded to HPUD. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.17. Per the 2018 HPUD Service Area plan the per capita housing density is 3.91 persons/residence (or apartment unit). The HPUD Service Area plan noted the per capita water usage is 125 gallons/person/day. The total water usage for each parcel comprised of 60 apartment units is; 60 apartment units x 3.91 persons/unit x 125 gallons/person/day = 29,325 gallons per day. The total water usage for the entire proposed development (Parcels 1 through 5) is 5 parcels x 29,325 gallons/parcel = 146,625 gallons per day for all 300 apartment units at full buildout.

The irrigation usage for the common open space is included in the per capita apartment domestic water demand. The Community Building and Swimming Pool (if applicable) water demands are anticipated to be minimal compared to the apartment usage demands. It is anticipated the Community Building water demand will be approximately 675 gallons/day.

The anticipated water demand for each parcel is anticipated to be 29,325 gallons per day (apartments) + 675 gallons/day (Community Center) = 30,000 gallons per day/parcel. **The anticipated water demand for the entire 5 parcel development at full build out is anticipated to be 30,000 gallons/parcel x 5 parcels = 150,000 gallons per day.**

The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

1.18. The HPUD Water Treatment Plant (WTP) rated capacity is 4.0 Million Gallons per Day. The WTP peak flow recorded for the last full year of flow records in 2019 was 1.536 MGD. The WTP excess capacity is 4.0 MGD – 1.536 MGD = 2.464 MGD. HPUD is committed to serve water service to other approved developments in the approximate amount of 0.15 MGD. HPUD has a non-committed excess capacity of 2.464 – 0.15 = 2.314 MGD. If HPUD approved water service to the proposed development the HPUD non-committed excess capacity would be 2.314 MGD – 0.150 MGD = 2.164 MGD. HPUD has sufficient WTP capacity to serve the proposed development.

The developer of the proposed project will be required to submit a "Will Serve" request letter to HPUD. HPUD will consider and respond to the "Will Serve" request letter upon its receipt.

The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

1.19. The Developer will be required to pay fees to HPUD for the review of Water Improvement Plans and for construction inspection during the project construction phase in accordance with HPUD Resolution Number 2004-5, 2004-6 and 2006-01. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.20. The Developer will be required to pay HPUD Water Service Capacity Fees in accordance with HPUD Ordinance Number 2017-1. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

1.21. The project is located within the Heber Meadows Community Facilities District (CFD #2005-1) Zone 2. The Developer/Applicant shall initiate the amendment of CFD #2005-1 to establish a cost recovery mechanism for the maintenance of public facilities within and serving the project site.

2. Sanitary Sewer

Parcels 1 through 5

2.1. It is to be noted there was not sanitary sewer pipeline schematic layout illustrated on the Tentative Map. Sanitary sewer main conditions are therefore presented without the benefit of the developers sanitary sewer conceptual layout. A sanitary sewer pipeline schematic plan configuration shall be prepared by the developer and approved by the HPUD Engineer prior to the approval of the first Parcel's improvement plans. **A proposed 12-inch sanitary sewer pipeline serving lots 1 through 5 was illustrated on the revised Tentative Tract Map dated 6/23/2021 connecting to an existing 12-inch pipeline in Bloomfield Street. It will be necessary for the design engineer to complete hydraulic calculations during the preparation of improvement plans to demonstrate that directing the sewer flow from the fully developed lots 1 through 5 does not exceed the capacity of the existing 12-inch sanitary sewer pipeline along Bloomfield Avenue. It may be required to direct the wastewater flow of several of the lots through a gravity pipeline connected to Correll Road if the existing 12-inch pipeline in Bloomfield Street cannot accommodate the wastewater flow of one or more of the lots.**

2.2. A minimum new ~~8-inch~~ **12-inch** diameter SDR 26 PVC dedicated pipeline shall extend from Parcel 1 to Bloomfield Street for Parcel 1 **and Parcel 2**. The minimum slope of the ~~8-inch~~ **12-inch** pipeline shall be ~~0.35~~ **0.22** percent. A new manhole shall connect the new the ~~8-inch~~ **12-inch** diameter SDR 26 PVC pipeline to the ~~10-inch~~ **12-inch** sanitary sewer pipeline in

Bloomfield Street. A.C., pcc curb and gutter and pcc sidewalk demolition and replacement for the installation of the pipeline and manhole in the improved street area shall be accomplished in accordance with County of Imperial Public Works Department requirements.

2.3. Piezometers to establish the depth of the water table near the connection point of ~~each new 8 inch~~ the proposed 12-inch diameter SDR 26 PVC pipeline for Parcels 1 and 2 to the ~~10 inch~~ 12-inch sanitary sewer pipeline within Bloomfield Street shall be installed by a Geotechnical Engineering Firm in a location which will not be disturbed during construction. A geotechnical recommendation for the pipeline installation shall be prepared if the new the ~~8 inch~~ 12-inch pipeline section in the vicinity of Bloomfield Street is located beneath the water table. The improvement plans and specifications shall include dewatering specifications and identify the location the water resultant from the dewatering operation is to be discharged.

~~2.4. Minimum 6 inch diameter SDR 26 PVC dedicated pipelines installed at a minimum 0.5 percent slope shall extend from each Parcel 1 Apartment Unit to the 8 inch diameter SDR 26 PVC sanitary sewer pipeline. A double cleanout shall be placed at the connection of the 6 inch pipeline to each Apartment Unit point of connection. A single cleanout shall be placed at the connection of the 6 inch diameter SDR 26 PVC lateral pipelines to the new 8 inch diameter SDR 26 PVC pipeline.~~ The design engineer shall complete hydraulic calculations to determine the diameter sizes of the laterals extending from the new 12-inch sanitary sewer pipeline serving Parcel 1 and 2 Apartments. Double cleanouts shall be placed at the lateral point of the connection to each Apartment Building. A single cleanout or manhole shall be placed at the connection of the lateral to the new 10-inch diameter pipeline.

~~2.5. A minimum new 8 inch diameter SDR 26 PVC dedicated pipeline shall extend from Parcel 2 to Bloomfield Street or Correll Road for Parcel 2. The minimum slope of the 8 inch pipeline shall be 0.35 percent. A new manhole shall connect the new 8 inch diameter SDR 26 PVC pipeline to the 10 inch sanitary sewer pipeline in Bloomfield Street or the 30 inch diameter sanitary sewer pipeline in Correll Road. A.C., pcc curb and gutter and pcc sidewalk demolition and replacement for the installation of the pipeline and manhole in the improved street area shall be accomplished in accordance with County of Imperial Public Works Department requirements.~~

~~2.6. Minimum 6 inch diameter SDR 26 PVC dedicated pipelines installed at a minimum 0.5 percent slope shall extend from each Parcel 2 Apartment Unit to the 8 inch diameter SDR 26 PVC sanitary sewer pipeline. A double cleanout shall be placed at the connection of the 6 inch pipeline to each Apartment Unit point of connection. A single cleanout shall be placed at the connection of the 6 inch diameter SDR 26 PVC lateral pipelines to the new 8 inch diameter SDR 26 PVC pipeline.~~

2.5. Parcels 3, 4 and 5 shall connect to the existing 30 inch diameter sanitary sewer pipeline located along Correll Road with a common 12 inch diameter SDR 26 PVC sanitary sewer pipeline installed at a minimum 0.22 percent slope along the common lot line between lots 3 and 5 and lots 4 and 5 **unless hydraulic calculations prepared by the design engineer and reviewed and approved by the Heber Public Utility District Engineer determine the wastewater flow from Parcel 1 through 5 can be directed to the existing 12-inch sanitary sewer pipeline along Bloomfield Street without overloading the capacity of the existing 12-inch sanitary sewer pipeline.** A new manhole shall connect the new 12 inch diameter SDR 26 PVC sanitary sewer pipeline to the 30 inch diameter sanitary sewer pipeline in Correll Road. A new manhole shall be installed at the southern termination point of the 12 inch sanitary sewer pipeline. A.C., pcc curb and gutter and pcc sidewalk demolition and replacement for the installation of the pipeline and manhole in the improved street area shall be accomplished in accordance with County of Imperial Public Works Department requirements.

2.6. ~~Minimum 6-inch diameter SDR 26 PVC dedicated sanitary sewer pipeline installed at a minimum 0.5 percent slope shall extend from each Parcel 3, 4 and 5 Apartment Unit to the 12-inch diameter SDR 26 PVC pipeline. A double cleanout shall be placed at the connection of the 6-inch pipeline to each Apartment Unit point of connection. A single cleanout shall be placed at the connection of the 6-inch diameter SDR 26 PVC lateral pipelines to the new 12 inch diameter SDR 26 PVC pipeline.~~ **The design engineer shall complete hydraulic calculations to determine the diameter sizes of the laterals extending from the new 12-inch serving the Parcel , 4 and 5 Apartments. Double cleanouts shall be placed at the lateral point of the connection to each Apartment Building. A single cleanout or manhole shall be placed at the connection of the lateral to the new sanitary sewer pipeline.**

2.7. **Per item 2.5, if it is determined that the sanitary sewer flow from lots 3, 4, and 5 is to be directed to the existing wastewater pipeline in Correll Road, then a** piezometer to establish the depth of the water table near the connection point of the new 12 inch diameter SDR 26 PVC sanitary sewer pipeline to the existing 30 inch pipeline within Correll Road shall be installed by a Geotechnical Engineering Firm in a location which will not be disturbed during construction. A geotechnical recommendation for the pipeline installation shall be prepared if the new 12 inch pipeline section in the vicinity of Correll Road is located beneath the water table. The improvement plans and specifications shall include dewatering specifications and identify the location the water resultant from the dewatering operation is to be discharged.

2.8. The sanitary sewer pipelines and manholes shall be tested in accordance with the HPUD Standard Details and Specifications. **The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.**

2.9. The interior of the manholes shall be coated with a Raven Epoxy System. The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

2.10. The developer shall engage a California Licensed Land Surveyor or California Civil Engineer authorized to perform Surveys to ~~prepare easement legal descriptions and plat drawings~~ illustrate new sanitary sewer easements in favor of HPUD on the Final Map for this project. ~~along the length of the 8 inch and 12 inch sanitary sewer pipelines serving Parcels 1 through 5~~. The easements for the 8 inch sanitary sewer pipelines shall be 15 feet wide. The easements along the 12 inch sanitary sewer pipeline shall be 20 foot wide. The easement locations shall be illustrated on the Improvement Plans.

2.11. The HPUD Wastewater Treatment Plant (WWTP) rated capacity is 1.2 Million Gallons per Day. The WWTP monthly average high discharge flow in 2019 was 0.80 MGD. The WWTP excess capacity is 0.40 MGD. HPUD is committed to serve wastewater service to other approved developments in the approximate amount of 0.10 MGD. HPUD has a non-committed excess WWTP capacity of 0.40 – 0.10 = 0.30 MGD. It is estimated the wastewater generated from the proposed fully developed project will be 0.10 MGD. **The HPUD non-committed excess WWTP capacity after service is provided to the proposed development will be 0.30 MGD – 0.10 MGD = 0.20 MGD.** HPUD has sufficient wastewater capacity to service the proposed development. The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

2.12. The Developer will be required to pay fees to HPUD for the review of sanitary sewer pipeline improvement plans and for construction inspection during the project construction phase in accordance with HPUD Resolution Number 2004-5, 2004-6 and 2006-01. The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

2.13. The Developer will be required to pay HPUD Wastewater Service Capacity Fees in accordance with HPUD Ordinance Number 2017-2. The Developer/Applicant agreed to this item based on the response letter dated September 7, 2021.

2.14. The project is located within the Heber Meadows Community Facilities District (CFD #2005-1) Zone 2. The Developer/Applicant shall initiate the amendment of CFD #2005-1 to establish a cost recovery mechanism for the maintenance of public facilities within and serving the project site.

3. **Stormwater**

Parcels 1 through 5

~~3.1. It is to be noted there was not a stormwater pipeline schematic layout illustrated on the Tentative Map. In addition the existing Parcel 5 stormwater retention basin and upstream stormwater underground pipelines and catch basins are not illustrated on the Tentative Map. There was no hydrology study or stormwater assessment provided with the Tentative Map. Stormwater facility conditions presented by this review letter are therefore presented without the benefit of the developers backup hydrology documents or proposed storm pipeline schematic plan.~~

~~3.2. An existing earth lined stormwater retention basin was previously constructed within the Parcel 5 area during the construction of the Heber Meadows Development. Underground stormwater pipelines and catch basins are located within Pitzer Road and at the southwest corner of Pitzer Road and Correll Road. The stormwater intercepted and conveyed by the catch basins and stormwater pipelines is directed to the existing earth lined retention basin located within Parcel 5. The Heber Public Utility District will not be the owner of or operate and maintain the retention basin located on Parcel 5.~~

~~3.3. The stormwater flow from parcels 1, 2, 3 and 4 shall be allowed to drain to the Heber Meadows Retention Basin located at the southwest corner of Correll Road and Bloomfield Street if a Hydrology Study prepared by the developer can demonstrate that the Heber Meadows Retention Basin has sufficient capacity, in excess of the existing 100 year stormwater volume directed from the Heber Meadows Subdivision, to accept the additional 100 year stormwater volume from parcels 1, 2, 3 and 4 and if an acceptable agreement can be negotiated between the Developer and HPUD per item 3.6 below.~~

~~If the hydrology study proves that the existing Heber Meadows Retention Basin can accept the additional 100 year stormwater volume from parcels 1, 2, 3 and 4 an underground stormwater pipeline system shall be prepared in schematic form for parcels 1, 2, 3 and 4. The horizontal pipeline configuration, proposal pipeline diameter sizes, pipeline flowline elevations and slopes, finish design grade above the pipelines and depth of cover over the proposed pipeline, connection to the existing Heber Meadows Retention Basin and other issues shall be reviewed. After the schematic design is completed and approved by HPUD the Plan and Profile stormwater pipeline improvement plans shall be prepared for each parcel and submitted to HPUD for review and approval.~~

~~3.4. The developer shall engage a California Licensed Land Surveyor or California Civil Engineer authorized to perform survey work to prepare easement legal descriptions and plat drawings in favor of HPUD along the length stormwater pipelines to be placed within Parcels 1 through 4. The easements along the length of the stormwater pipelines shall be 15 feet in width.~~

~~3.5. The Developer will be required to pay fees to HPUD for the review of the Geotechnical Reports and stormwater improvement plans and for construction inspection during the project construction phase in accordance with HPUD Resolution Number 2004-5, 2004-6 and 2006-01.~~

~~3.6. The Developer will be required to pay prorated fees to HPUD for directing stormwater from Parcels 1, 2, 3 and 4 to the Heber Meadows retention basin. The Developer shall be required to enter into an agreement with HPUD for the prorated cost to operate and maintain the Heber Meadows Retention Basin. The Developer shall also pay a capacity fee to HPUD for the percentage of the Parcels 1, 2, 3 and 4 retention basin stormwater volume multiplied by the Retention Basin capital cost.~~

3.1. A Hydrology Study has been prepared for the project dated 3/24/2021 by Egan Civil, Inc. The primary results of the Hydrology Study find that the existing large 6.9 acre Heber Meadows retention basin, referred to as the West Retention Basin, can accommodate the 100 year storm water runoff volume of the proposed Miraluz Development, prior existing Heber Meadows Subdivision Development and future Heber Meadows related developments.

The Hydrology Study also determined that the existing partially constructed Retention Basin west of Pitzer and south of Corral Road, referred to as the East Retention Basin, is required to accept stormwater flows from a portion of Corral Road and Pitzer Road. Existing catch basins and underground pipelines have been previously constructed and extended to the partially constructed East Retention Basin. The Hydrology Study recommends the East Retention Basin be increased in size to accommodate the 100 year stormwater flow from the upstream reach from which stormwater flow is collected. The increased East Retention Basin is illustrated on Tentative Tract Map 00992.

The HPUD Engineer has reviewed the Hydrology Study and has found the stormwater study to be accurate.

3.2. A Hydraulic Profile shall be prepared during the preparation of the improvement plans for the first developed lot. The Hydraulic Profile shall illustrate the bottom of the West and East Retention Basins, water level within each Retention Basin after the 100 year storm, top of the East and West Retention Basin Slope, inlet and outlet elevations of the 36 inch diameter main collector pipeline extending through Lots 1 through 5, flowline slope of the 36 inch pipeline and the pipelines and top of catch basins upstream of the East Retention Basin within Pitzer and Corral Roads and upstream of the 36 inch pipeline for each lot.

3.3. A large diameter 36 inch stormwater pipeline is illustrated to be constructed in an east-west orientation through Lots 1 through 5. From the developers comment number 3.2 the

stormwater runoff collected from Lots 1 through 5 is to be directed to the 36 inch stormwater pipeline. None of the stormwater runoff collected from Lots 1 through 5 is to be directed to the East Retention Basin.

The HPUD Engineer and Developer's Engineer discussed the existing utilities and pipelines within Bloomfield Street during the preparation of the revised Tentative Map. The revised Tentative Map illustrates the elevations of utilities within Bloomfield Street to address conflicts with the proposed 36 inch stormwater pipeline. A plan and profile sheet for the 36 inch stormwater pipeline will be required to be prepared with the improvement plans. The existing utilities will be required to be illustrated on both the plan and profile section of the plan and profile improvement plan. The 36 inch stormwater pipeline installation will require the demolition and replacement of A.C. pavement, pcc sidewalk, pcc curb and gutter, fencing and other infrastructure in the Bloomfield Street right of way. The developer shall complete the demolition and replacement of the infrastructure in conformance with the County of Imperial Public Works Department requirements. The plan and profile sheet shall be reviewed and approved by the HPUD Engineer prior to approval of the improvement plans.

The improvement plans for each of the Lots shall illustrate the detailed stormwater branch pipelines, catch basins, manholes and layout of the stormwater system for each lot. The detailed stormwater system for each lot shall be reviewed and approved by the HPUD Engineer prior to approval of the improvement plans.

3.4. The East Retention Basin 36 inch pipeline shall be equipped with a concrete outlet structure with a sluice gate to allow the stormwater entering the East Retention Basin to be stored in the East Retention Basin for a minimum time period determined by HPUD prior to allowing the stormwater to enter the west retention basin.

3.5. The developer shall engage a California Licensed Land Surveyor or California Civil Engineer authorized to perform survey work to prepare easement legal descriptions and plat drawings in favor of HPUD along the length of the stormwater pipelines placed within Lots 1 through 5. The stormwater pipeline easements shall be 15 feet in width. The easements shall also be allowed to be processed with the Final Maps except that stormwater facilities constructed on lots prior to the filing of the Final Maps shall be processed by a separate legal description and plat process.

3.6. In the event HPUD accepts the East Retention Basin for operation and maintenance the following shall be required:

3.6.1. Concrete inlet and outlet pipeline structures shall be included in conformance with the requirements of HPUD and approval of the HPUD Engineer.

3.6.2. A separate plan sheet shall be prepared for the Retention Basin. Sections shall be illustrated through the Retention Basin in an east-west and north-south orientation.

3.6.3. A 12 foot wide class 2 base access roadway shall be constructed around the perimeter of the Retention Basin top of slope.

3.6.4. A 12 foot wide concrete access roadway shall be designed from the Retention Basin top of slope to the bottom of the retention basin. A 10 foot wide x 20 foot long x 8 inch deep pcc landing slab shall be constructed at the base of the 12 foot concrete access roadway for operation and maintenance purposes.

3.6.5. A tubular steel fence shall be placed along the exterior edge of the Retention Basin access roadway placed around the perimeter of the Retention Basin top of slope. A lockable gate shall be placed along the fence for access to the Retention Basin.

3.7. The Developer/Applicant shall initiate the formation of the new Community Services District (or amend Community Facilities District 2005-1) to establish a cost recovery mechanism for the maintenance of public facilities within and serving the project site.

3.8. The Developer will be required to pay prorated fees to HPUD for directing stormwater from Parcels 1, 2, 3, 4 and 5 to the Heber Meadows retention basin. The Developer shall be required to enter into an agreement with HPUD for the prorated cost to operate and maintain the Heber Meadows (West) Retention Basin. The Developer shall also pay a capacity fee to HPUD for the percentage of the Parcels 1, 2, 3 and 4 retention basin stormwater volume multiplied by the Retention Basin capital cost.

4. Parks and Recreation

3.5. Heber Public Utility District is responsible for the provision of parks and recreation in the community of Heber. The proposed project will result in 1,173 new residents at ultimate buildout which will result in an increased demand for the existing parks in Heber. The Developer/Property Owner shall be required to enter into an agreement with HPUD to offset the cost of the provision of parks and recreation services~~. This shall be in the form of a monthly fee per dwelling unit payable to HPUD.~~ The project is located within the Heber Meadows Community Facilities District (CFD #2005-1) Zone 2. The Developer/Applicant shall initiate the amendment of CFD #2005-1 to establish a cost recovery mechanism for the maintenance of public facilities within and serving the project site.

As noted in the requirements listed above, the project is located within the Heber Meadows Community Facilities District. The project site is not currently subject to an assessment, but the CFD was always intended to be amended once the project site is developed. A copy of the Community Facilities District Report for CFD #2005-1 is included for use by the Developer/Applicant.

Again, we thank you for the opportunity to provide comments. Should you have any questions or need additional information, please do not hesitate to contact Laura Fischer at the number listed on the letterhead or Jack Holt at The Holt Group at (760)337-3883.

Sincerely,

James G. "Jack" Holt, P.E
THE HOLT GROUP, INC.

Attachments: Community Facilities District Report

COMMUNITY FACILITIES DISTRICT REPORT

HEBER PUBLIC UTILITY DISTRICT
COMMUNITY FACILITIES DISTRICT NO. 2005-1
(Heber Meadows)

Prepared for

Heber Public Utility District

Prepared by

General Government Management Services

July 2005

TABLE OF CONTENTS

EXHIBITS

I. INTRODUCTION

WHEREAS, the Board of Directors of the Heber Public Utility District did, pursuant to the provisions of the "Mello-Roos Community Facilities Act of 1982," being Chapter 2.5, Part 1, Division 2, Title 5 of the Government Code of the State of California (hereinafter referred to as the "Act"), and specifically Section 53321.5 thereof, expressly order the filing of a written "Report" with the legislative body of the proposed community facilities district. This community facilities district being Heber Public Utility District Community Facilities District No. 2005-1 (Heber Meadows) ("CFD 2005-1"); and

WHEREAS, on June 15, 2005 the Board of Directors of the Heber Public Utility District adopted "A Resolution of Intention of the Board of Directors of the Heber Public Utility District to Establish Heber Public Utility District Community Facilities District No. 2005-1 (Heber Meadows) and to Authorize the Levy of a Special Tax Within Heber Public Utility District Community Facilities District No. 2005-1 (Heber Meadows), and Approving a Deposit and Reimbursement Agreement In Connection Therewith" (the "Resolution of Intention"), ordering the Report and directing that said Report generally contain the following:

1. A brief description of the public facilities and services proposed to be financed, which will be required to adequately meet the needs of CFD No. 2005-1;

2. An estimate of the fair and reasonable cost of financing the facilities and services for CFD No. 2005-1.

NOW, THEREFORE, General Government Management Services, as the appointed Special Tax Consultant, was directed to prepare the Report pursuant to the provisions of the Act, and do hereby submit this Report to the Board of Directors of the Heber Public Utility District.

II. PROJECT DESCRIPTION

The purpose of CFD No. 2005-1 is to (i) finance the acquisition, purchase, expansion, improvement, rehabilitation, and/or construction of certain public facilities and connection and capacity fees which benefit the property proposed for development; (ii) finance the provision of certain services to serve CFD 2005-1; and (iii) pay incidental expenses incurred in connection therewith. Public facilities and services that may be financed by CFD No. 2005-1 are described in Section III A below.

CFD No. 2005-1 is generally located south of Correll Road, east of Rockwood Street, and north of Sixth Street, designated as Tract No. 00956. The current designated Assessor's Parcel Numbers (APN) and Ownership are presented in Exhibit C to this Report. CFD No. 2005-1, Zone 1 is planned to ultimately consist of 219 single homes. The minimum Taxable Acreage for CFD No. 2005-1 is 29.5 acres in Zone 1. Zone 2 has a $-0- Special Tax.

III. DESCRIPTION AND ESTIMATED COST OF PROPOSED FACILITIES AND SERVICES

A. Description of Proposed Public Facilities and Services

A community facilities district may provide for the purchase, construction, expansion or rehabilitation of any real or tangible property, including public facilities and infrastructure improvements, with an estimated useful life of five (5) years or longer, which is necessary to meet increased demands placed upon local agencies as a result of development or rehabilitation occurring within the community facilities district.

Authorized public facilities to be financed by CFD No. 2005-1 include the following:

(i) water and sewer facilities of the Heber Public Utility District (the "HPUD"),

(ii) drainage and canal facilities of the Imperial Irrigation District, and

A community facilities district may provide for services. Services for CFD 2005-1 to be financed include maintenance of parks, retention basins, parkways, and open space.

The preceding facilities and services, which the legislative body creating CFD No. 2005-1 and other local agencies are authorized to own, construct, or finance, are required, in part, to adequately meet the needs of CFD No. 2005-1. Facilities described herein are those currently, in whole or part, expected to be financed by CFD No. 2005-1. The Special Taxes required to pay for the construction or acquisition of said facilities and payment of said services will be apportioned as described in the Rate and Method of Apportionment of the Special Tax for CFD No. 2005-1. Public facilities and services proposed to be financed are more specifically described in Exhibit A, attached herein. Since the Resolution of Intention, (iii) school facilities, has been removed and will be collected directly by the two School Districts.

B. Estimated Cost of Proposed Public Facilities and Fees

The costs listed in the following Table 1 are estimates only. Actual costs may differ from those estimated below.

Table 1
Community Facilities District No. 2005-1
Estimate Cost for Proposed Public Facilities and Fees

Description Of Improvement	Estimated Costs	
Heber Public Utility District		
Water Improvements in Correll Road	$315,100	
Sanitary Sewer Improvements in Correll Road	291,080	
Water Improvements in Pitzer Road	155,840	
Water Improvements in Rockwood Street	53,235	
Sanitary Sewer Improvements in Rockwood Street	129,100	
Regional Wastewater Pump Station	1,359,000	
Engineering, Inspection, Construction Management	141,653	
Imperial Irrigation District		
Imperial Irrigation District Facilities	$464,000	
Engineering, Inspection, Construction Management	69,600	
Total Estimated Costs of Facilities		**$2,978,608**
Debt Service Reserve Fund	$167,051	
Capitalized Interest Fund	140,154	
Underwriter's Discount	50,000	
Incidental Expenses	200,000	
Total Costs of Financing and Formation		**$557,205**
Bond Contingency	$1,964,187	
Grand Total Authorized Bond Amount		**$5,500,000**
Heber Public Utility District		
2006-2007 Annual Maintenance of Parks, Retention Basins, Parkways, and Open Space	$ 10,950	
Total 2006-2007 Estimated Costs of Services		**$ 10,950**

IV. BONDED INDEBTEDNESS AND INCIDENTAL EXPENSES

A. Projected Bond Sales

The maximum authorized bonded indebtedness for CFD No. 2005-I is $5,500,000.

B. Incidental Bond Issuance Expenses

Pursuant to Section 53345.3 of the Act, bonded indebtedness may include all costs and estimated costs incidental to, or connected with, the accomplishment of the purpose for which the proposed debt is to be incurred, including, but not limited to, the costs of legal, fiscal, and financial consultant fees; bond and other reserve funds; discount fees; interest on any bonds due and payable within two years of the issuance of the bonds; election costs; and all costs of issuance of the bonds, including, but not limited to, fees for bond counsel, appraiser, market absorption consultant, trustee, costs of obtaining credit ratings, bond insurance premiums, fees for letters of credit, and other credit enhancement costs, and printing costs. There will be no bonds issued for Special Taxes for Services.

C. Expenses for the Annual Levy of Special Taxes

Pursuant to Section 53340 of the Act, the proceeds of any special tax may only be used to pay, in whole or part, the cost of providing public facilities, services and incidental expenses. As defined by the Act, incidental expenses include, but are not limited to, the cost of planning and designing public facilities to be financed, including the cost of environmental evaluations of those facilities; the costs associated with the creation of the community facilities district, issuance of bonds, determination of the amount of taxes, collection of taxes, payment of taxes, or costs otherwise incurred in order to carry out the authorized purposes of the community facilities district; and any other expenses incidental to the construction, completion, and inspection of the authorized work. While the actual cost of administering CFD No. 2005-1 may vary, it is anticipated that the amount of special taxes which can be collected will be sufficient to fund at least $15,000 in annual administrative expenses.

V. SUMMARY OF THE RATE AND METHOD OF APPORTIONMENT

All of the property located within CFD No. 2005-1, unless exempted by law or by the adopted Rate and Method of Apportionment, shall be taxed for the purpose of providing necessary facilities and fees to serve CFD No. 2005-1. Pursuant to Section 53325.3 of the Act, the tax imposed "is a special tax and not a special assessment, and there is no requirement that the tax be apportioned on the basis of benefit to any property." The Special Tax "may be based on benefit received by parcels of real property, the cost of making facilities or authorized services available to each parcel or other reasonable basis as determined by the legislative body," although the Special Tax may not be apportioned on an *ad valorem* basis pursuant to Article XIIIA of the California Constitution.

Exhibit B presents the Rate and Method of Apportionment for CFD No. 2005-1, adopted as a part of the Resolution of Intention, except for certain modifications noted below. The Rate and Method of Apportionment provides information to allow each property owner within CFD No. 2005-1 to estimate the maximum annual Special Taxes to be paid.

Changes in the Rate and Method of Apportionment since the Resolution of Intention. The School Districts have requested to be removed from this CFD to pursue a separate CFD for School facilities and fees. As such Special Tax B for both Zones 1 and 2 has been removed and the List of Facilities in Exhibit A has been appropriately amended. There have not been any additional changes to the Rate and Method of Apportionment. The recommended version is attached as Exhibit B to this Report.
In order to establish the Assigned Special Tax rates for Developed Property, the Maximum Special Tax rate for Undeveloped Property, and the Backup Special Tax rate, and as set forth in the Rate and Method of Apportionment for CFD No. 2005-1, General Government Management Services has relied on information regarding absorption, land-use types, net taxable acreage, and taxable property provided to it by others. General Government Management Services has not independently verified such data and disclaims responsibility for the impact of inaccurate data, if any, on the Rate and Method of Apportionment for CFD No. 2005-1, including the inability to meet the financial obligations of CFD No. 2005-1.

The recommended Special Tax rates for CFD No. 2005-1 for each Fiscal Year are as follows:

TABLE 2
ASSIGNED SPECIAL TAX FOR FACILITIES WITHIN ZONE 1

Land Use Type	Building Square Footage	Assigned Special Tax for Facilities
Single Family Property	Less than 1,800	$832 per dwelling unit
Single Family Property	1,800-2,000	$871 per dwelling unit
Single Family Property	Greater than 2,000	$974 per dwelling unit
Non-Residential Property	N/A	$6,653 per Acre
Multifamily Property	N/A	$6,653 per Acre
Undeveloped Property	N/A	$6,653 per Acre

ASSIGNED SPECIAL TAX FOR FACILITIES WITHIN ZONE 2

Land Use Type	Building Square Footage	Assigned Special Tax for Facilities
Multifamily Property	N/A	$0 per Acre
Non-Residential Property	N/A	$0 per Acre
Undeveloped Property	N/A	$0 per Acre

Backup Special Tax: The Backup Special Tax is a calculated amount per Lot, unless the Final Map relating to property within CFD 2005-1 is changed or modified, in which case, the Backup Annual Special Tax is a calculated amount per Acre, based on the total Developed Property acreage for each Zone and the total Dwelling Units for each Zone.

Service Annual Special Tax: The Maximum Special Tax for Services in Zone 1 for each Assessor's Parcel of Developed Property classified as Single Family Property for Fiscal Year 2006-2007 shall be $50 per dwelling unit. The Maximum Special Tax for Services for each Assessor's Parcel of Developed Property within Zone 1 that is classified as Non-Residential Property or Multifamily Property for Fiscal Year 2006-2007 shall be $200

per Acre. The Maximum Special Tax for Services in Zone 1 for each Assessor's Parcel of Undeveloped Property for Fiscal Year 2006-2007 shall be $200 per acre. There is no Special Tax for Services in Zone 2. On each July 1, commencing July 1, 2007, the Maximum Special Tax for Services in Zone 1 for the prior Fiscal Year shall be adjusted by an amount equal to the percentage change in the Consumer Price Index for the Calendar Year ending in December of the prior Fiscal Year.

VI. BOUNDARIES OF COMMUNITY FACILITIES DISTRICT NO. 2005-1

The boundaries of CFD No. 2005-1 includes all land on which Special Taxes may be levied. The Council approved the Boundary Map as a part of the Resolution of Intention. A map of the area included within CFD No. 2005-1 is on file in the Office of the Clerk of the Board and is made by reference herein. It was recorded in the Office of the Imperial County Recorder as Instrument Number 05-23557, in Book 2 of Maps of Assessment and Community Facilities District at Page 31.

Respectfully Submitted,
General Government Management Services

EXHIBIT "A"

REVISED
DESCRIPTION OF FACILITIES AND SERVICES
HEBER PUBLIC UTILITY DISTRICT
COMMUNITY FACILITIES DISTRICT NO. 2005-1
(Heber Meadows)

The facilities (the "Facilities") and services (the "Services") described below are proposed to be financed by Heber Public Utility District Community Facilities District No. 2005-1 (Heber Meadows) (the "District"). The cost of the Facilities and Services shall include incidental expenses, including but not limited to costs associated with forming the District, issuance of bonds (Facilities only), determination of the amount of the Special Tax, collection of the Special Tax, payment of the Special Tax, costs incurred in order to carry out the authorized purposes of the District, and the costs of engineering, inspecting, coordinating, completing, planning and designing the Facilities, including the costs of environmental evaluations.

Facilities

The facilities to be financed by the District consist generally of the acquisition, purchase, construction, expansion, improvement, or rehabilitation of the public improvements required as a condition of approval of the subdivision tract map relating to the development of the property within the proposed District and other public improvement serving property within the proposed District and are generally described as follows:

(i) water and sewer facilities of the Heber Public Utility District (the "HPUD"),

(ii) drainage and canal facilities of the Imperial Irrigation District, and

The improvements shall include all related clearing and grubbing, grading, and appurtenances, and any removal or temporary signage or markings related thereto. Any of the facilities to be constructed shall be constructed, whether or not acquired in their completed states, pursuant to plans and specifications approved by the HPUD, the Imperial Irrigation District, the Heber Elementary School District, and/or the Central Union High School District, and the respective officials thereof, including each such agency's engineers, as applicable. The final nature and location of the facilities will be determined upon the preparation of final plans and specifications for such facilities. Such facilities and improvements include (but shall not be limited to) the improvements listed below, and other facilities of the same type or types may be substituted in the place of one or more of the specific improvements listed below.

HEBER PUBLIC UTILITY DISTRICT IMPROVEMENTS

A. Water Improvements

1. Correll Road: Rockwood Avenue to Pitzer Road
2. Pitzer Road: Correll Road to subdivision boundary

3. Rockwood Avenue: Correll Road to existing connection point

B. Sanitary Sewer Improvements

1. Correll Road: Rockwood Avenue to Pitzer Road
2. Rockwood Avenue: Correll Road to existing manhole

C. Regional Wastewater Pump Station

IMPERIAL IRRIGATION DISTRICT IMPROVEMENTS

A. Undergrounding of Central Drain 3-D No. 1

B. Undergrounding of a portion of Daffodil Canal and the relocation of certain canal facilities at the northeast corner of SR-86 and Pitzer Road

Services

The services to be financed include maintenance of parks, retention basins, parkways, and open space to be located within the boundaries of the District, including but not limited to landscaping, furnishing water for irrigation, spraying, fertilizing, cultivation, trimming, and removal of trimmings, rubbish and debris. The costs of Services shall include the costs of labor, material, administration, personnel, equipment, and utilities, including but not limited to salaries of the HPUD staff related to, and a proportionate share of HPUD overhead costs in connection with, providing such Services.

EXHIBIT "B"

REVISED
RATE AND METHOD OF APPORTIONMENT
HEBER PUBLIC UTILITY DISTRICT
COMMUNITY FACILITIES DISTRICT NO. 2005-1
(Heber Meadows)

The following sets forth the Rate and Method of Apportionment for the levy and collection of Special Taxes of the Heber Public Utility District ("HPUD") Community Facilities District No. 2005-1 (Heber Meadows) ("CFD No. 2005-1"). The Special Tax shall be levied on and collected in CFD No. 2005-1 each Fiscal Year, in an amount determined through the application of the Rate and Method of Apportionment described below. All of the real property in CFD No. 2005-1, unless exempted by law or by the provisions hereof, shall be taxed for the purposes, to the extent, and in the manner herein provided.

SECTION A
DEFINITIONS

The terms hereinafter set forth have the following meanings:

"Acre or Acreage" means the land area of an Assessor's Parcel as shown on an Assessor's Parcel Map, or if the land area is not shown on an Assessor's Parcel Map, the land area shown on the applicable final map, parcel map, condominium plan, or other similar recorded instrument. The square footage of an Assessor's Parcel is equal to the Acreage multiplied by 43,560.

"Act" means the Mello-Roos Communities Facilities Act of 1982 as amended, being Chapter 2.5, Division 2 of Title 5 of the Government Code of the State of California.

"Administrative Expenses" means any ordinary and necessary expense incurred by CFD No. 2005-1 or its designee, or by the HPUD or its designee on behalf of CFD No. 2005-1, related to the determination of the amount of the levy of Special Taxes, the collection of Special Taxes including the expenses of collecting delinquencies, the administration of Bonds (including the costs of the Trustee (including its legal counsel) in the discharge of the duties required of it under the bond indenture, fiscal agent agreement, or similar instrument pursuant to which the Bonds are issued (as amended, modified, and/or supplemented from time to time, and any instrument replacing or supplementing the same)), compliance with arbitrage rebate requirements, compliance with disclosure requirements of HPUD, CFD No. 2005-1, or obligated persons associated with applicable federal and state securities laws and the Act, any appeal of the Special Tax, the release of funds from an escrow account, HPUD's annual administration fees and third party expenses, the payment of the allocable portion of salaries and benefits of any HPUD employee whose duties are directly related to the administration of CFD No. 2005-1, and costs otherwise incurred in order to carry out the authorized purposes of CFD No. 2005-1.

"Assessor's Parcel" means a lot or parcel of land designated on an Assessor's Parcel Map with an assigned Assessor's Parcel Number within the boundaries of CFD No. 2005-1.

"Assessor's Parcel Map" means an official map of the Assessor of the County designating parcels by Assessor's Parcel Number.

"Assessor's Parcel Number" means that number assigned to an Assessor's Parcel by the County for purposes of identification.

"Assigned Special Tax for Facilities" means the Special Tax of that name as described in Section D below.

"Backup Special Tax for Facilities" means the Special Tax of that name described in Section E below.

"Board" means the Board of Directors of the Heber Public Utility District, acting as the legislative body of CFD No. 2005-1, or its designee.

"Bonds" means any obligation to repay a sum of money, including obligations in the form of bonds, notes, certificates of participation, long-term leases, loans from government agencies, or loans from banks, other financial institutions, private businesses, or individuals, or long-term contracts, or any refunding thereof, to which revenues from Special Tax for Facilities have been pledged.

"Building Permit" means a permit for new construction for a residential dwelling or non-residential structure. For purposes of this definition, "Building Permit" shall not include permits for construction or installation of, retaining walls, utility improvements, or other such improvements not intended for human habitation.

"Building Square Footage" or "BSF" means the square footage of assessable internal living space, exclusive of garages or other structures not used as living space, as determined by reference to the building permit application for such Assessor's Parcel.

"Calendar Year" means the period commencing January 1 of any year and ending the following December 31.

"CFD No. 2005-1" means Heber Public Utility District Community Facilities District No. 2005-1 (Heber Meadows) established by the HPUD under the Act.

"Consumer Price Index" means the index published monthly by the U.S. Department of Labor Statistics for all urban consumers in the Los Angeles–Riverside–Orange County area.

"County" means the County of Imperial.

"Developed Property" means all Assessor's Parcels for which Building Permits were issued on or before March 1 of the prior Fiscal Year, provided that such Assessor's Parcels were included in a Final Map that was recorded on or before January 1 of the prior Fiscal Year.

"Exempt Property" means all Assessors' Parcels designated as being exempt from Special Taxes in Section J.

"Final Map" means a subdivision of property evidenced by the recordation of a final map, parcel map, or lot line adjustment, pursuant to the Subdivision Map Act (California Government Code Section 66410 *et seq.*) or the recordation of a condominium plan pursuant to California Civil Code 1352 that creates individual lots for which Building Permits may be issued without further subdivision.

"Fiscal Year" means the period commencing on July 1 of any year and ending the following June 30.

"HPUD" means the Heber Public Utility District.

"Lot" means an individual legal lot created by a Final Map for which a Building Permit could be issued.

"Maximum Special Tax" means the Maximum Special Tax for Facilities and/or Maximum Special Tax for Services, as applicable.

"Maximum Special Tax for Facilities" means the maximum Special Tax for Facilities, determined in accordance with Section C, that can be levied by CFD No. 2005-1 in any Fiscal Year on any Assessor's Parcel.

"Maximum Special Tax for Services" means the maximum Special Tax for Services, determined in accordance with Section C, that can be levied by CFD No. 2005-1 in any Fiscal Year on any Assessor's Parcel.

"Multifamily Property" means all Assessor's Parcels of Residential Property consisting of one or more dwelling units within a building comprised of attached residential units.

"Non-Residential Property" means all Assessor's Parcels of Developed Property for which a Building Permit was issued for any type of non-residential use.

"Operating Fund" means a fund that shall be maintained for CFD No. 2005-1 for any Fiscal Year to pay for the actual costs of maintenance related to the Service Area, and the applicable Administrative Expenses.

"Operating Fund Balance" means the amount of funds in the Operating Fund at the end of the preceding Fiscal Year.

"Partial Prepayment Amount" means the amount required to prepay a portion of the Special Tax for Facilities obligation for an Assessor's Parcel, as described in Section H.

"Prepayment Amount" means the amount required to prepay the Special Tax for Facilities obligation in full for an Assessor's Parcel, as described in Section G.

"Proportionately" means that i) the ratio of the actual Special Tax for Facilities levy to the applicable Assigned Special Tax for Facilities is equal for all applicable Assessor's Parcels and ii) the ratio of the actual Special Tax for Services levy to the applicable Maximum Special Tax for Services is equal for all applicable Assessor's Parcels. In the case of Developed Property subject to the apportionment of the Special Tax for Facilities under step three of Section F.1., "Proportionately" in step three means that the quotient of (a) the actual Special Tax for Facilities levy less the Assigned Special Tax for Facilities divided by (b) the Backup Special Tax for Facilities less the Assigned Special Tax for Facilities, is equal for all applicable Assessor's Parcels.

"Residential Property" means all Assessor's Parcels of Developed Property for which a Building Permit has been issued for purposes of constructing one or more residential dwelling units.

"Service Area" means parks, parkways, open space and retention basins within the boundaries of CFD No. 2005-1 and the HPUD.

"Single Family Property" means all Assessor's Parcels of Residential Property other than Multifamily Property.

"Special Tax" means Special Tax for Facilities and/or Special Tax for Services, as applicable, or any subgroup thereof defined in this Section A.

"Special Tax for Facilities" means any of the special taxes authorized to be levied by CFD No. 2005-1 pursuant to the Act to fund the Special Tax Requirement for Facilities.

"Special Tax Requirement for Facilities" means for CFD No. 2005-1 that amount required in any Fiscal Year to pay: (i) the debt service or the periodic costs on all outstanding Bonds due in the Calendar Year that commences in such Fiscal Year, (ii) Administrative Expenses, (iii) the costs associated with the release of funds from an escrow account, (iv) any amount required to establish or replenish any reserve funds established in association with the Bonds, (v) anticipated delinquent Special Tax for Facilities based on the delinquency rate in CFD No. 2005-1 for the previous Fiscal Year, and (vi) for the collection or accumulation of funds for the acquisition or construction of facilities authorized by CFD No. 2005-1 provided that the inclusion of such amount does not cause an increase in the levy of Special Tax for Facilities on Undeveloped Property, less (vii) any amount available to pay debt service or other periodic costs on the Bonds pursuant to any applicable bond indenture, fiscal agent agreement, or trust agreement.

"Special Tax for Services" means any of the special taxes authorized to be levied by CFD No. 2005-1 pursuant to the Act to fund the Special Tax Requirement for Services.

"Special Tax Requirement for Services" means the amount determined in any Fiscal Year for CFD No. 2005-1 equal to (i) the budgeted costs associated with the Service Area for the current Fiscal Year, (ii) the portion of the Administrative Expenses of CFD No. 2005-1 attributable to Special Tax for Services, and (iii) anticipated delinquent Special Taxes for Services based on the delinquency rate in CFD No. 2005-1 for the previous Fiscal Year, less (iv) the Operating Fund Balance.

"Taxable Property" means all Assessor's Parcels within CFD No. 2005-1 which are not Exempt Property.

"Trustee" means the trustee, fiscal agent, or paying agent under the bond indenture, fiscal agent agreement, resolution or other instrument pursuant to which Bonds are issued, as modified, amended and/or supplemented from time to time, and any instrument replacing or supplementing the same.

"Undeveloped Property" means all Assessor's Parcels of Taxable Property which are not Developed Property.

"Unit" means each separate residential dwelling unit that comprises an independent facility capable of conveyance separate from adjacent residential dwelling units.

"Zone 1" means a specific geographic area as depicted on the most recent boundary map for CFD No. 2005-1 on file with the County of Imperial Recorder's Office.

"Zone 2" means a specific geographic area as depicted on the most recent boundary map for CFD No. 2005-1 on file with the County of Imperial Recorder's Office.

SECTION B
CLASSIFICATION OF ASSESSOR'S PARCELS

Each Fiscal Year, beginning with Fiscal Year 2006-2007, each Assessor's Parcel within CFD No. 2005-1 shall be assigned to Zone 1 or Zone 2 and shall be classified as Taxable Property or Exempt Property. Each Fiscal Year, each Assessor's Parcel of Taxable Property shall be further classified as Developed Property or Undeveloped Property. In addition, each Assessor's Parcel of Developed Property shall further be classified as Single Family Property, Multifamily Property or Non-Residential Property with each Assessor's Parcel of Single Family Property assigned to its appropriate Assigned Special Tax for Facilities rate based on its Building Square Footage.

SECTION C
MAXIMUM SPECIAL TAXES

1. <u>Developed Property</u>

   a. The Maximum Special Tax for Facilities for each Assessor's Parcel of Developed Property that is classified as Single Family Property in any Fiscal Year shall be the amount determined by the greater of (i) the application of the Assigned Special Tax for Facilities in Table 1 or (ii) the application of the Backup Special Tax for Facilities. The Maximum Special Tax for Facilities for each Assessor's Parcel of Developed Property that is classified as Non-Residential Property and Multifamily Property in any Fiscal Year shall be the Assigned Special Tax for Facilities in Table 1 or Table 2, as applicable.

b. The Maximum Special Tax for Services for each Assessor's Parcel of Developed Property within Zone 1 that is classified as Single Family Property for Fiscal Year 2006-2007 shall be $50 per dwelling unit. The Maximum Special Tax for Services for each Assessor's Parcel of Developed Property within Zone 1 that is classified as Non-Residential Property or Multifamily Property for Fiscal Year 2006-2007 shall be $200 per Acre. On each July 1, commencing July 1, 2007, the Maximum Special Tax for Services applicable to Zone 1 for the prior Fiscal Year shall be adjusted by an amount equal to the percentage change in the Consumer Price Index for the Calendar Year ending in December of the prior Fiscal Year. No Special Tax for Services shall be levied on any Assessor's Parcel of Developed Property within Zone 2 in any Fiscal Year.

2. **Undeveloped Property**

a. The Maximum Special Tax for Facilities for each Assessor's Parcel classified as Undeveloped Property shall be the Assigned Special Tax for Facilities in Table 1 or Table 2, as applicable.

b. The Maximum Special Tax for Services for each Assessor's Parcel of Undeveloped Property within Zone 1 for Fiscal Year 2006-2007 shall be $200 per Acre. On each July 1, commencing July 1, 2007, the Maximum Special Tax for Services applicable to Zone 1 for the prior Fiscal Year shall be adjusted by an amount equal to the percentage change in the Consumer Price Index for the Calendar Year ending in December of the prior Fiscal Year. No Special Tax for Services shall be levied on any Assessor's Parcel of Undeveloped Property within Zone 2 in any Fiscal Year.

SECTION D
ASSIGNED SPECIAL TAX FOR FACILITIES

Each Fiscal Year, commencing Fiscal Year 2006-2007, each Assessor's Parcel of Developed Property or Undeveloped Property shall be subject to the Assigned Special Tax for Facilities and shall be determined pursuant to Tables 1 and 2 below.

TABLE 1
ASSIGNED SPECIAL TAX FOR FACILITIES WITHIN ZONE 1

Land Use Type	Building Square Footage	Assigned Special Tax for Facilities
Single Family Property	Less than 1,800	$832 per dwelling unit
Single Family Property	1,800-2,000	$871 per dwelling unit
Single Family Property	Greater than 2,000	$974 per dwelling unit
Non-Residential Property	N/A	$6,653 per Acre
Multifamily Property	N/A	$6,653 per Acre
Undeveloped Property	N/A	$6,653 per Acre

TABLE 2
ASSIGNED SPECIAL TAX FOR FACILITIES WITHIN ZONE 2

Land Use Type	Building Square Footage	Assigned Special Tax for Facilities
Multifamily Property	N/A	$0 per Acre
Non-Residential Property	N/A	$0 per Acre
Undeveloped Property	N/A	$0 per Acre

SECTION E
BACKUP SPECIAL TAX FOR FACILITIES

Each Fiscal Year, each Assessor's Parcel of Developed Property within Zone 1 classified as Single Family Property shall be subject to a Backup Special Tax for Facilities. In each Fiscal Year, the Backup Special Tax for Facilities rate for Developed Property within Zone 1 classified as Single Family Property within a Final Map shall be the rate per Lot calculated according to the following formula:

$$B = \frac{R \times A}{L}$$

The terms above have the following meanings:

B	=	Backup Special Tax for Facilities per Lot in each Fiscal Year
R	=	Maximum Special Tax for Facilities rate per Acre for Undeveloped Property within Zone 1 for the applicable Fiscal Year
A	=	Acreage of Developed Property classified or to be classified as Single Family Property in such Final Map

L = Lots in the Final Map which are classified or to be classified as Single Family Property

Notwithstanding the foregoing, if all or any portion of the Final Map(s) described in the preceding paragraph is subsequently changed or modified, then the Backup Special Tax for Facilities for each Assessor's Parcel of Developed Property classified or to be classified as Single Family Property in such Final Map area that is changed or modified shall be a rate per square foot of Acreage calculated as follows:

1. Determine the total Backup Special Tax for Facilities anticipated to apply to the changed or modified Final Map area prior to the change or modification.

2. The result of paragraph 1 above shall be divided by the Acreage of Developed Property classified or to be classified as Single Family Property which is ultimately expected to exist in such changed or modified Final Map area, as reasonably determined by the Board.

3. The result of paragraph 2 above shall be divided by 43,560. The result is the Backup Special Tax for Facilities per square foot of Acreage which shall be applicable to Assessor's Parcels of Developed Property classified as Single Family Property in such changed or modified Final Map area for all remaining Fiscal Years in which the Special Tax for Facilities may be levied.

SECTION F
METHOD OF APPORTIONMENT OF THE SPECIAL TAX FOR FACILITIES AND THE SPECIAL TAX FOR SERVICES

1. Special Tax for Facilities

Commencing Fiscal Year 2006-2007 and for each subsequent Fiscal Year, the Board shall levy a Special Tax for Facilities on all Taxable Property within CFD No. 2005-1 until the amount of Special Tax for Facilities equals the Special Tax Requirement for Facilities in accordance with the following steps:

Step One: The Special Tax for Facilities shall be levied Proportionately on each Assessor's Parcel of Developed Property at up to 100% of the applicable Assigned Special Tax for Facilities rates in Tables 1 and 2 as needed to satisfy the Special Tax Requirement for Facilities.

Step Two: If additional moneys are needed to satisfy the Special Tax Requirement for Facilities after the first step has been completed, the Special Tax for Facilities shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property, excluding any Undeveloped Property pursuant to Section J, at up to 100% of the Maximum Special Tax for Facilities applicable to each such Assessor's Parcel as needed to satisfy the Special Tax Requirement for Facilities.

Step Three: If additional moneys are needed to satisfy the Special Tax Requirement for Facilities after the first two steps have been completed, then for each Assessor's Parcel of Developed Property whose Maximum Special Tax for Facilities is the Backup Special Tax for Facilities shall be increased Proportionately from the Assigned Special Tax for Facilities up to 100% of the Backup Special Tax for Facilities as needed to satisfy the Special Tax Requirement for Facilities.

Step Four: If additional moneys are needed to satisfy the Special Tax Requirement for Facilities after the first three steps have been completed, the Special Tax for Facilities shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property classified as Undeveloped Property pursuant to Section J at up to 100% of the Maximum Special Tax for Facilities applicable to each such Assessor's Parcel as needed to satisfy the Special Tax Requirement for Facilities.

2. Special Tax for Services

Commencing Fiscal Year 2006-2007 and for each subsequent Fiscal Year, the Board shall levy a Special Tax for Services on all Taxable Property within CFD No. 2005-1 to fund the Special Tax Requirement for Services to the extent permitted in accordance with the following steps:

Step One: The Maximum Special Tax for Services shall be levied Proportionately on each Assessor's Parcel of Developed Property within Zone 1 at up to 100% of the applicable Maximum Special Tax for Services as needed to fund the Special Tax Requirement for Services.

Step Two: If additional moneys are needed to fund the Special Tax Requirement for Services after the first step has been completed, the Maximum Special Tax for Services shall be levied Proportionately on each Assessor's Parcel of Undeveloped Property within Zone 1 included in a Final Map, at up to 100% of the Maximum Special Tax for Services applicable to each such Assessor's Parcel as needed to fund the Special Tax Requirement for Services.

Under no circumstances will the Special Tax for Facilities or the Special Tax for Services levied against any Assessor's Parcel used as a private residence be increased as a consequence of delinquency or default by the owner of any other Assessor's Parcel or Parcels within CFD No. 2005-1 by more than ten (10) percent of the Special Tax that would be levied in that Fiscal Year, if there were no delinquencies, pursuant to California Government Code Section 53321(d), as in effect on the date of formation of CFD No. 2005-1.

SECTION G
PREPAYMENT OF SPECIAL TAX FOR FACILITIES

The following additional definitions apply to this Section G:

"CFD Public Facilities" means $2,000,000 expressed in 2005 dollars, which shall increase by the Construction Inflation Index on January 1, 2006, and on each January 1 thereafter, or such lower number as (i) shall be determined by the Board as sufficient to provide the public facilities under the authorized bonding program for CFD No. 2005-1, or (ii) shall be determined by the Board concurrently with a covenant that it will not issue any more Bonds to be supported by Special Taxes for Facilities levied under this Rate and Method of Apportionment.

"Construction Fund" means an account specifically identified in the bond indenture, fiscal agent agreement, or trust agreement for Bonds, or functionally equivalent to hold funds which are currently available for expenditure to acquire or construct public facilities eligible under CFD No. 2005-1.

"Construction Inflation Index" means the annual percentage change in the Engineering News-Record Building Cost Index for the City of Los Angeles, measured as of the Calendar Year which ends in the previous Fiscal Year. In the event this index ceases to be published, the Construction Inflation Index shall be another index as determined by the Board that is reasonably comparable to the Engineering News-Record Building Cost Index for the City of Los Angeles.

"Future Facilities Costs" means the CFD Public Facilities minus public facility costs available to be funded through existing construction or escrow accounts or funded by the Outstanding Bonds, and minus public facility costs funded by interest earnings on the Construction Fund actually earned prior to the date of prepayment.

"Outstanding Bonds" means all previously issued Bonds issued and secured by the levy of Special Tax for Facilities which will remain outstanding after the first interest and/or principal payment date following the current Fiscal Year, excluding Bonds to be redeemed at a later date with the proceeds of prior prepayments of Special Taxes for Facilities.

The Special Tax for Facilities obligation of an Assessor's Parcel of Developed Property, an Assessor's Parcel of Undeveloped Property for which a Building Permit has been issued or an Assessor's Parcel of Undeveloped Property that is classified as Undeveloped Property pursuant to Section J may be prepaid in full, provided that there are no delinquent Special Taxes, penalties, or interest charges outstanding with respect to such Assessor's Parcel at the time the Special Tax for Facilities obligation would be prepaid. The Prepayment Amount for an Assessor's Parcel eligible for prepayment shall be determined as described below.

An owner of an Assessor's Parcel intending to prepay the Special Tax for Facilities obligation shall provide the Board with written notice of intent to prepay, and within 5 days of receipt of such notice, the Board shall notify such owner of the amount of the non-refundable deposit determined to cover the cost to be incurred by CFD No. 2005-1 in calculating the proper amount of a prepayment. Within 30 days of receipt of such non-refundable deposit, the Board shall notify such owner of the

prepayment amount of such Assessor's Parcel. Any prepayment must be made not less than 45 days prior to the next occurring date that notice of redemption of the Bonds from the proceeds of such prepayment may be given by the Trustee pursuant to the applicable bond indenture, fiscal agent agreement, or trust agreement.

The Prepayment Amount for each applicable Assessor's Parcel shall be calculated according to the following formula (capitalized terms defined below):

	Bond Redemption Amount
plus	Redemption Premium
plus	Future Facilities Amount
plus	Defeasance
plus	Administrative Fee
less	Reserve Fund Credit
equals	Prepayment Amount

As of the date of prepayment, the Prepayment Amount shall be calculated as follows:

1. For Assessor's Parcels of Developed Property, compute the Assigned Special Taxes for Facilities and the Backup Special Taxes for Facilities, if any, applicable to the Assessor's Parcel. For Assessor's Parcels of Undeveloped Property, excluding any Undeveloped Property pursuant to Section J, compute the Assigned Special Tax for Facilities and the Backup Special Tax for Facilities applicable to the Assessor's Parcel as though it was already designated as Developed Property based upon the Building Permit issued or to be issued for that Assessor's Parcel. For Assessor's Parcels of Undeveloped Property, classified as Undeveloped Property pursuant to Section J, compute the Assigned Special Tax for Facilities.

2. For each Assessor's Parcel of Developed Property or Undeveloped Property to be prepaid, (a) divide the Assigned Special Tax for Facilities computed pursuant to paragraph 1 for such Assessor's Parcel by the sum of the estimated Assigned Special Tax for Facilities applicable to all Assessor's Parcels of Taxable Property at buildout, as reasonably determined by the Board, and (b) divide the Backup Special Tax for Facilities computed pursuant to paragraph 1 for such Assessor's Parcel by the sum of the estimated Backup Special Tax for Facilities applicable to all Assessor's Parcels of Taxable Property at buildout, as reasonably determined by the Board.

3. Multiply the larger quotient computed pursuant to paragraph 2(a) or 2(b) by Outstanding Bonds. The product shall be the "Bond Redemption Amount".

4. Multiply the Bond Redemption Amount by the applicable redemption premium, if any, on the Outstanding Bonds to be redeemed with the proceeds of the Bond Redemption Amount. This product is the "Redemption Premium."

5. Compute the Future Facilities Cost, if all authorized Bonds have not yet been issued.

6. Multiply the larger quotient computed pursuant to paragraph 2 (a) or 2 (b) by the amount determined pursuant to paragraph 5. to determine the Future Facilities Cost to be prepaid (the "Future Facilities Amount").

7. Compute the amount needed to pay interest on the Bond Redemption Amount to be redeemed with the proceeds of the Prepayment Amount from the first Bond interest and/or principal payment date following the current Fiscal Year until the earliest redemption date for the Outstanding Bonds.

8. Estimate the amount of interest earnings to be derived from the reinvestment of the Bond Redemption Amount plus the Redemption Premium until the earliest redemption date for the Outstanding Bonds.

9. Subtract the amount computed pursuant to paragraph 8 from the amount computed pursuant to paragraph 7. This difference is the "Defeasance."

10. Estimate the administrative fees and expenses associated with the prepayment, including the costs of computation of the Prepayment Amount, the costs of redeeming Bonds, and the costs of recording any notices to evidence the prepayment and the redemption. This amount is the "Administrative Fee."

11. Calculate the "Reserve Fund Credit" as the lesser of: (a) the expected reduction in the applicable reserve requirements, if any, associated with the redemption of Outstanding Bonds as a result of the prepayment, or (b) the amount derived by subtracting the new reserve requirement(s) in effect after the redemption of Outstanding Bonds as a result of the prepayment from the balance in the applicable reserve funds on the prepayment date. Notwithstanding the foregoing, if the reserve fund requirement is satisfied by a surety bond or other instrument at the time of the prepayment, then no Reserve Fund Credit shall be given. Notwithstanding the foregoing, the Reserve Fund Credit shall in no event be less than 0.

12. The Prepayment Amount is equal to the sum of the Bond Redemption Amount, the Redemption Premium, the Future Facilities Amount, the Defeasance, and the Administrative Fee, less the Reserve Fund Credit.

13. From the Prepayment Amount, the amounts computed pursuant to paragraphs 3, 4, 9, and 11 shall be deposited into the appropriate fund as established under the bond indenture, fiscal agent agreement, or trust agreement and used to retire Outstanding Bonds or make debt service payments. The amount computed pursuant to paragraph 6 shall be deposited into the Construction Fund. The amount computed pursuant to paragraph 10 shall be retained by CFD No. 2005-1.

With respect to a Special Tax for Facilities obligation that is prepaid pursuant to this Section G, the Board shall indicate in the records of CFD No. 2005-1 that there has been a prepayment of the Special Tax for Facilities obligation and shall cause a suitable notice to be recorded in compliance with the Act within thirty (30) days of receipt of such prepayment to indicate the prepayment of the

Special Tax for Facilities obligation and the release of the Special Tax for Facilities lien on such Assessor's Parcel, and the obligation of such Assessor's Parcel to pay such Special Taxes for Facilities shall cease.

Notwithstanding the foregoing, no prepayment will be allowed unless the amount of Special Tax for Facilities that may be levied on Taxable Property, net of an allocable portion of Administrative Expenses, shall be at least 1.1 times the regularly scheduled annual interest and principal payments on all currently Outstanding Bonds in each future Fiscal Year.

SECTION H
PARTIAL PREPAYMENT OF SPECIAL TAX FOR FACILITIES

Prior to the issuance of the first Building Permit for the construction of a production Unit on a Lot within a Final Map, the owner of no less than all of the property within such Final Map may elect to prepay any portion of the applicable Special Tax for Facilities obligation of all, and not less than all, of the Assessor's Parcels within such Final Map. Such owner of all the property within a Final Map who desires such partial prepayment shall notify the Board with written notice of (i) such owner's intent to partially prepay the Special Tax for Facilities obligation, and (ii) the percentage of the Special Tax for Facilities obligation to be prepaid. The partial prepayment for the Special Tax for Facilities obligation shall be collected at the issuance of each applicable Building Permit, provided that the Special Tax for Facilities obligation with respect to model Units for which Building Permits have already been issued must be partially prepaid up to the entire percentage specified in the owner's notification to the Board at the time of the submission of the notification of intent to prepay. The Partial Prepayment Amount shall be calculated according to the following formula:

$$PP = (P_G - A) \times F + A$$

These terms have the following meanings:

PP	=	the Partial Prepayment Amount
P_G	=	the Special Tax Prepayment Amount calculated according to Section G
F	=	the percentage of the Special Tax for Facilities obligation the owner of the Assessor's Parcel is partially prepaying.
A	=	the Administrative Fee calculated according to Section G

With respect to all such Assessor's Parcels Special Tax for Facilities obligations that are partially prepaid, the Board shall indicate in the records of CFD No. 2005-1 that there has been a partial prepayment of the applicable Special Tax for Facilities obligation and shall cause a suitable notice to be recorded in compliance with the Act within thirty (30) days of receipt of such partial prepayment, to indicate the partial prepayment of the Special Tax for Facilities obligation with respect to such Assessor's Parcels, and the obligation of such Assessor's Parcels to pay such prepaid portion of the applicable Special Tax for Facilities shall cease. Additionally, the notice shall indicate that: (i) the Assigned Special Tax for Facilities, as applicable, and (ii) the Backup Special Tax for Facilities, as

applicable, for the Assessor's Parcels has been reduced by an amount equal to the percentage which was partially prepaid.

Notwithstanding the foregoing, no partial prepayment will be allowed unless the amount of the applicable Special Tax for Facilities that may be levied in CFD No. 2005-1, net of an allocable portion of Administrative Expenses, is at least 1.1 times the regularly scheduled annual interest and principal payments on all currently Outstanding Bonds in each future Fiscal Year.

SECTION I
TERMINATION OF SPECIAL TAX

For each Fiscal Year the Special Tax for Facilities shall be levied on all Assessor's Parcels subject to the Special Tax for Facilities, but not later than the 2044-2045 Fiscal Year. The Special Tax for Services shall be levied as long as it is needed to meet the Special Tax Requirement for Services, as determined at the sole discretion of the Board.

SECTION J
EXEMPTIONS

The Board shall classify as Exempt Property (i) Assessor's Parcels owned by the State of California, Federal or other local governments, (ii) Assessor's Parcels which are used as places of worship and are exempt from *ad valorem* property taxes because they are owned by a religious organization, (iii) Assessor's Parcels used exclusively by a homeowners' association, or (iv) Assessor's Parcels with public or utility easements making impractical their utilization for other than the purposes set forth in the easement, provided that no such classification would reduce the sum of all Taxable Property within Zone 1 to less than 29.5 Acres. Notwithstanding the above, the Board shall not classify an Assessor's Parcel as Exempt Property if such classification would reduce the sum of all Taxable Property within Zone 1 to less than 29.5 Acres. Assessor's Parcels which cannot be classified as Exempt Property because such classification would reduce the Acreage of all Taxable Property within Zone 1 to less than 29.5 Acres will continue to be classified as Undeveloped Property, and will continue to be subject to Special Taxes accordingly.

SECTION K
APPEALS

Any property owner claiming that the amount or application of the Special Tax is not correct may file a written notice of appeal with the Board not later than twelve months after having paid the first installment of the Special Tax that is disputed. A representative(s) of CFD No. 2005-1 shall promptly review the appeal, and if necessary, meet with the property owner, consider written and oral evidence regarding the amount of the Special Tax, and rule on the appeal. If the representative's decision requires that the Special Tax for an Assessor's Parcel be modified or changed in favor of the property owner, a cash refund shall not be made (except for the last year of levy), but an adjustment shall be made to the Special Tax on that Assessor's Parcel in the subsequent Fiscal Year(s).

The Board may interpret this Rate and Method of Apportionment for purposes of clarifying any ambiguity and make determinations relative to the annual administration of the Special Tax and any landowner or resident appeals. Any decision of the Board shall be binding as to all persons.

SECTION L
MANNER OF COLLECTION

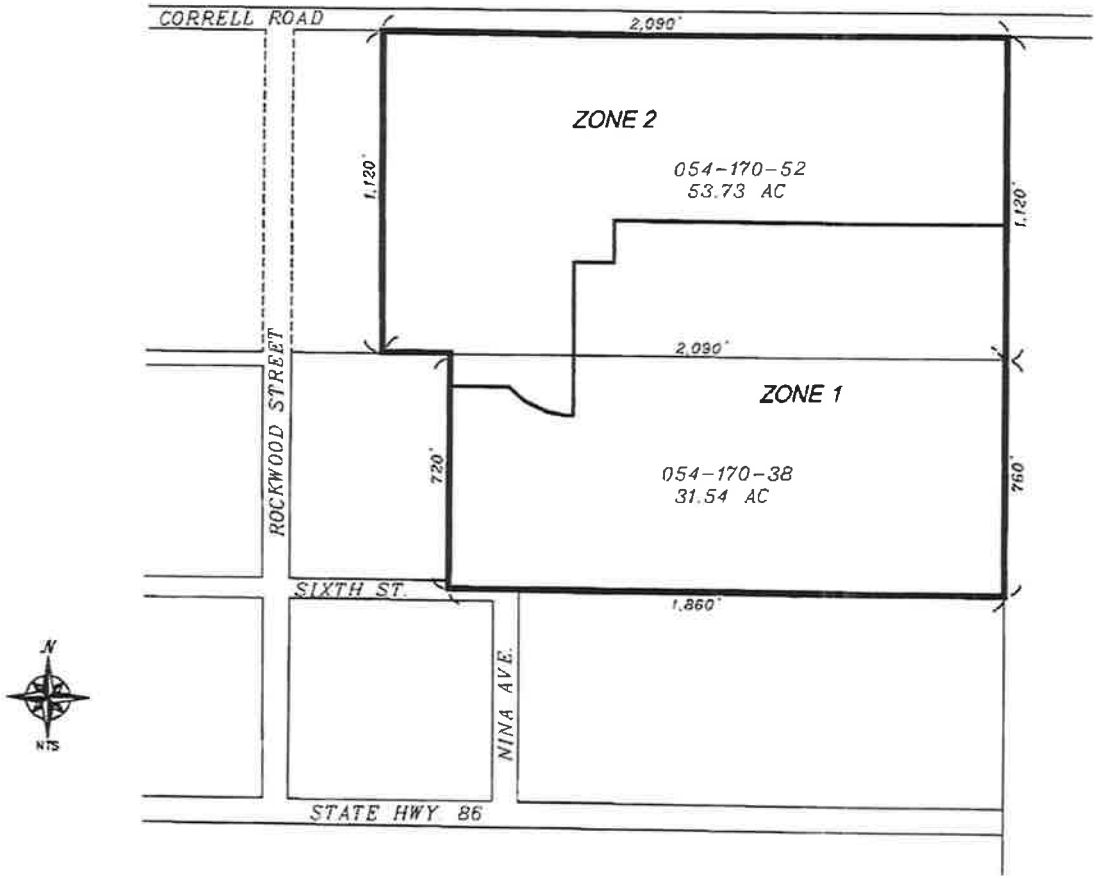
The Special Tax shall be collected in the same manner and at the same time as ordinary *ad valorem* property taxes, provided, however, that CFD No. 2005-1 may collect the Special Tax at a different time or in a different manner if necessary to meet its financial obligations.

EXHIBIT "C"

ASSESSOR'S PARCEL NUMBERS AND PROPERTY OWNER HEBER PUBLIC UTILITY DISTRICT COMMUNITY FACILITIES DISTRICT NO. 2005-1 (Heber Meadows)

APN	Title Holder
054-170-38	Heber Meadows I, LLC.; and Heber 142, LLC.
054-170-52	Heber Meadows I, LLC.; and Heber 142, LLC.

PROPOSED BOUNDARY MAP OF THE HEBER PUBLIC UTILITY DISTRICT COMMUNITY FACILITIES DISTRICTNO. 2005-1 (HEBER MEADOWS) COUNTY OF IMPERIAL, STATE OF CALIFORNIA



FILED IN THE OFFICE OF THE CLERK OF THE BOARD OF THE HEBER PUBLIC UTILITY DISTRICT, THIS ___ DAY OF _____ 2005

_____
CLERK OF THE BOARD

I HEREBY CERTIFY THAT THE WITHIN MAP SHOWING BOUNDARIES OF THE HEBER PUBLIC UTILITY DISTRICT COMMUNITY FACILITIES DISTRICT NO. 2005-1 (HEBER MEADOWS), COUNTY OF IMPERIAL, STATE OF CALIFORNIA, WAS APPROVED BY THE BOARD OF THE HEBER PUBLIC UTILITY DISTRICT AT A REGULARLY SCHEDULED MEETING THEREOF, HELD ON THE __ DAY OF _____ 2005 BY ITS RESOLUTION NO. _____

_____
CLERK OF THE BOARD

THE BOUNDARIES OF THE DISTRICT INCLUDE ASSESOR PARCEL NUMBERS (APN).

054-170-38 AND 054-170-52
(TOWNSHIP 16 SOUTH, RANGE 14 EAST)

FILED THIS ___ DAY OF _____ 2005, AT THE HOUR OF __ O'CLOCK __M. IN BOOK ___ OF MAPS OF ASSESSMENT AND COMMUNITY FACILITIES DISTRICTS AT PAGE ___ AND AS INSTRUMENT NO. _____ IN THE OFFICE OF THE COUNTY RECORDER, IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA.

_____
COUNTY RECORDER, COUNTY OF IMPERIAL

Valerie Grijalva

From:	Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent:	Wednesday, November 3, 2021 1:06 PM
To:	Rosa Soto
Cc:	ICPDSCommentLetters
Subject:	RE: TR#00992 Second Request for Comments

RECEIVED
NOV 03 2021
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

CAUTION: This email originated outside our organization; please use caution.

This email is to inform you that we have no comments on this project.

From: Rosa Soto [mailto:RosaSoto@co.imperial.ca.us]
Sent: Friday, October 29, 2021 2:07 PM
To: Valerie Grijalva; Carlos Ortiz; Sandra Mendivil; Margo Sanchez; Matt Dessert; Monica Soucier; Adam Crook; Esperanza Colio; Alphonso Andrade; Jorge Perez; Jeff Lamoure; Mario Salinas; Robert Menvielle; Robert Malek; Andrew Loper; John Gay; Carlos Yee; Guillermo Mendoza; Ray Loera - Sheriff; Benavidez, Robert; ceo@pioneersmuseum.net; Donald Vargas; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty; Eaton, Maurice A@DOT; Landrum, Beth A@DOT; Sanchez Rangel, Rogelio@DOT; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC; Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer; frankbrown6928@gmail.com; Quechan Indian Tribe ; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org
Cc: Mariela Moran; Carina Gomez; John Robb; Kimberly Noriega; Maria Scoville; Shannon Lizarraga; Rosa Soto
Subject: RE: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached Geotechnical Report and Phase I Environmental Site Assessment studies for TR00992 Miraluz Project as they were not initially included in the Second Request for comments. Please note commenting period has been extended to **November 12, 2021 at 5:00 PM.**

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Rosa A. Soto
I.C. Planning & Development Services
801 Main St. El Centro, CA 92243
(442) 265-1736-P
(442) 265-1735-F
rosasoto@co.imperial.ca.us

The preceding e-mail message (including any attachments) contains information that may be confidential, be protected by the attorney-client or other applicable privileges, or constitute non-public information. It is intended to be conveyed only to the designated recipient(s). If you are not an intended recipient of this message, please notify the sender by replying to this message and then delete it from your system. Use, dissemination, distribution, or reproduction of this message by unintended recipients is not authorized and may be unlawful.

From: Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Sent: Tuesday, October 19, 2021 11:59 AM
To: Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Adam Crook <AdamCrook@co.imperial.ca.us>; Esperanza Colio <EsperanzaColio@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Menvielle <RobertMenvielle@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Benavidez, Robert <RBenavidez@icso.org>; ceo@pioneersmuseum.net; Donald Vargas <dvargas@iid.com>; wandrus@cuhsd.net; jcruz@hesdk8.org; lfischer@heber.ca.gov; CHP Captain Scott Laverty <slaverty@chp.ca.gov>; Eaton, Maurice A@DOT <maurice.eaton@dot.ca.gov>; Landrum, Beth A@DOT <beth.landrum@dot.ca.gov>; Sanchez Rangel, Rogelio@DOT <roger.sanchez-rangel@dot.ca.gov>; Nadim.Shukry-Zeywar@waterboards.ca.gov; Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>; Kai.Dunn@waterboards.ca.gov; steve.quartieri@parks.ca.gov; Magdalena Rodriguez <magdalena.rodriguez@wildlife.ca.gov>; leslie.hartzell@parks.ca.gov; julianne.polanco@parks.ca.gov; david.j.castanon@usace.army.mil; eduardo.t.demeza@usace.army.mil; hhaines@augustinetribe.com; marcuscuero@campo-nsn.gov; chairman@cit-nsn.gov; cocotcsec@cocopah.com; tashina.harper@crit-nsn.gov; wmicklin@leaningrock.net; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; frankbrown6928@gmail.com; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; katy.sanchez@nahc.ca.gov; cloyd@barona-nsn.gov; rgoff@campo-nsn.gov; michaelg@leaningrock.net; epinto@jiv-nsn.gov; lcumper@jiv-nsn.gov; jmiller@LPtribe.net; mesagrandeband@msn.com; allenl@sanpasqualtribe.org; ssilva@sycuan-nsn.gov; tmchair@torresmartinez.org
Cc: Mariela Moran <MarielaMoran@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Shannon Lizarraga <ShannonLizarraga@co.imperial.ca.us>
Subject: TR#00992 Second Request for Comments

Good Afternoon,

Please see attached ***Second*** Request for Comments Packet for Tentative Tract Map #00992 . Comments are due by **November 3, 2021 at 5:00 PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments Packet is being sent to you via this email.

Per size of attachment please use the following link to view packet.

https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:9f5ed0ec-de96-4489-9270-61f9931ca007

Should you have any questions regarding this project, please feel free to contact Planner Mariela Moran (442)265-1736 ext. 1747 or submit your comment letters to icpdscommentletters@co.imperial.ca.us

Thank you,

Valerie Grijalva
Office Assistant II
Planning and Development Services
801 Main Street
El Centro, CA 92243
Office: (442)265-1779
Fax: (442) 265-1735

Virus-free. www.avast.com

Valerie Grijalva

RECEIVED
OCT 28 2021
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

From: Ray Teran <rteran@viejas-nsn.gov>
Sent: Thursday, October 28, 2021 9:34 AM
To: ICPDSCommentLetters
Cc: Ernest Pingleton
Subject: Tentative Tract Map #00992 - APN 054-601-016-000

CAUTION: This email originated outside our organization; please use caution.

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

If you wish to utilize Viejas cultural monitors (Viejas rate is $54.15/hr. plus GSA mileage), please call Ernest Pingleton at 619-655-0410 or email, epingleton@viejas-nsn.gov, for contracting and scheduling. Thank you.

If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

Ray Teran
Viejas Tribal Government
Resource Management Director
619-659-2312
rteran@viejas-nsn.gov

Office of the
Agricultural Commissioner
Sealer of Weights & Measures

Carlos Ortiz
Agricultural Commissioner
Sealer of Weights & Measures

Jolene Dessert
Asst. Agricultural Commissioner
Asst. Sealer of Weights & Measures

December 7, 2020

RECEIVED
DEC 07 2020
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Joe Hernandez, Planner IV
Imperial County Planning & Development Services
801 Main Street
El Centro, CA 92243

Re: Tentative Tract Map #00992 – APN 054-601-016-000

Dear Mr. Hernandez,

Our office has received and reviewed the documents for Tentative Tract Map #00992 – APN 054-601-016-000 for Chelsea Investment Corporation on behalf of Heber Meadows I, LP who is proposing to create five lots for multi-family housing at 185 Willowbrook Way, Heber, California.

The applicant has indicated the Developer will provide landscaping for this project. Should this project move forward, our office asks that the applicant/Developer contact our Pest Detection and Eradication Division if they decided to source the nursery stock from outside Imperial County. There are numerous quarantines in effect to safeguard the landscape and agricultural industry from exotic and invasive pests and disease. All plants coming into Imperial County are required by law to be held for inspection by our office prior to being planted, which includes plant material from out of state. Please see the attached letter for more information.

If you have any questions, feel free to contact our office at 442-265-1500.

Regards,

Carlos Ortiz
Agricultural Commissioner

Office of the
Agricultural Commissioner
Sealer of Weights & Measures

Carlos Ortiz
Agricultural Commissioner
Sealer of Weights & Measures

Jolene Dessert
Asst. Agricultural Commissioner
Asst. Sealer of Weights & Measures

December 7, 2020

Landscaper/Nursery Letter-

This letter is to remind you of the requirements you must follow for movement of plant material into Imperial County. There are many quarantines which must be observed. The most complex is for the glassy-winged sharpshooter and detailed directions for compliance follow. However, there are a few other quarantines that you should be aware of and they are listed at the end of this letter.

There is a State Interior Quarantine in place to prevent artificial movement of the glassy-winged sharpshooter (GWSS). The GWSS is a hardy insect which feeds on many common landscape plants and crops. It carries and spreads *Xylella fastidiosa*, a bacterium which is deadly to many plants. Imperial County is the only Southern California County that is not infested with the glassy-winged sharpshooter, and is designated as an enforcing county.

A summary of the quarantine requirements for entry of GWSS-host nursery stock from infested counties:

- Nursery stock must be purchased from a nursery that is under Compliance Agreement with the Agricultural Commissioner's office in that County. The plants should enter Imperial County with paperwork that includes the GWSS Compliance Agreement Number stamp, the required blue tag (see below), and Certificate of Quarantine Compliance (CQC) if applicable.

- Every shipment of nursery stock from an infested county must be accompanied by a Warning Hold for Inspection Certificate also known as a blue tag. As stated on the blue tag, this requires the receiver to hold the shipment off sale upon arrival and call our office for an inspection. It is very important that we be notified immediately upon arrival of the plant shipment. You must not commingle the new shipment with previously-released nursery stock until released by our office. Our office hours are Monday through Friday, 8:00 AM to 5:00 PM. Please call as early as possible. If you intend to bring in plants on a Saturday or Holiday, you must notify our office in advance.

- Landscapers that have their own growing ground or holding yard where they store nursery stock are required to be licensed as a nursery. Landscapers that do not hold or store that stock prior to its delivery to the planting site do not need a license.

- All landscapers must comply with the requirements listed above for every shipment brought into the County. You also must hold the stock at its destination (preferably away from other plants) and call our office for an inspection - you may not plant any of the nursery stock until the plants have been inspected and released by our office. If you are buying and transporting nursery stock into Imperial County, it is your responsibility to obtain the required documents from the origin nursery and call for the inspection upon arrival.

- For every shipment, you must have a proof of ownership document for the nursery stock.

(442) 265-1500 • fax: (760) 353-9420 | 852 Broadway Street, El Centro, CA 92243
agcom@co.imperial.ca.us | http://www.co.imperial.ca.us/ag/

Penalties for failure to comply with the quarantine requirements listed above:

- Any violation of quarantine requirements is an infraction punishable by a fine of $1,000 for the first offense. For a second or subsequent offense within three years, the violation is punishable as a misdemeanor (Food and Ag Code, Section 5309).
- In lieu of any civil action, the Agricultural Commissioner may levy a civil penalty for up to $2,500 for each violation (Food and Ag Code, Section 5311).
- In addition to any other action taken, any violation of these requirements may be liable civilly in an amount not to exceed $10,000 for each violation (Food and Ag Code, Section 5310).
- Anyone that negligently or intentionally violates any quarantine regulation and imports a GWSS-infested plant that results in an infestation, or the spread of an infestation, may be civilly liable in an amount up to $25,000 for each violation (Food and Ag Code, Section 5028(c)).

Other restricted plant materials (if you intend to bring in any of the following commodities from outside Imperial County please contact us before the shipment date):

- Citrus species – All Citrus species are restricted from most locations within California.
- Phoenix palms – All palms of the Phoenix genus (this includes *Phoenix roebelinii*, a common landscape plant) originating in California are prohibited, unless it is from certain portions of Riverside County.
- Florida nursery stock- Must comply with California State Interior Quarantine CCR. 3271 Burrowing and Reniform Nematodes, RIFA federal Quarantine and other quarantines may apply.
- Arizona nursery stock- Must comply with California State Interior Quarantine CCR. 3261 Ozonium Root Rot.
- Also, if you intend to remove any plants from the soil and ship them out of Imperial County you must be certified free from Ozonium Root Rot. To do so you must be part of our program and you should contact our office.

If you have any questions please contact our office at (442) 265-1500.

Sincerely,

Rachel Garewal
Deputy Agricultural Commissioner
Pest Detection and Eradication

RE: Request for Review and Comment Letter TM00992

Mario Salinas <MarioSalinas@co.imperial.ca.us>

Tue 11/24/2020 11:07 AM

To: Maria Scoville <mariascoville@co.imperial.ca.us>
Cc: Joe Hernandez <JoeHernandez@co.imperial.ca.us>; Michael Abraham <MichaelAbraham@co.imperial.ca.us>; Carina Gomez <CarinaGomez@co.imperial.ca.us>; Gabriela Robb <GabrielaRobb@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>

Good morning Ms. Scoville,

Pertaining to TTM# 00992, Division of Environmental Health does not have any comments at this time.

Thank you,

Mario Salinas, MBA
Environmental Health Compliance Specialist I
Imperial County Public Health Department
Division of Environmental Health
797 Main Street Suite B, El Centro, CA 92243
mariosalinas@co.imperial.ca.us
Phone: (442) 265-1888
Fax: (442) 265-1903
www.icphd.org

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Imperial County
PLANNING & DEVELOPMENT SERVICES

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From: Maria Scoville <mariascoville@co.imperial.ca.us>
Sent: Friday, November 20, 2020 4:26 PM
To: Esperanza Colio-Ortiz <esperanzacolio@co.imperial.ca.us>; Matt Dessert <MattDessert@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Carlos Yee <CarlosYee@co.imperial.ca.us>; Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Meraz <SandraMeraz@co.imperial.ca.us>; Mayra Sanchez <MayraSanchez@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Lopez <AndrewLopez@co.imperial.ca.us>; Raymond Loera <rloera@ivbcsd.org>; rbernardez@ivbcsd.org; Jeff Livingston <JeffLivingston@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Robert Maxwell <RobertMaxwell@co.imperial.ca.us>; Beth Landrum <bethlandrum@dot.ca.gov>; Adam Crook <AdamCrook@co.imperial.ca.us>; Donald Vargas, III <DVargas@ID.com>; rdeal@ird.com; wanders@pvt.net; fischer@heber-ca.gov; Captain Scott Morrison <CHP(smorrison@chp.ca.gov)>; smorrison@chp.ca.gov; jen@bes-ltd.org; bhanis@imperialirrigation.com; marcie.mendez@mail.house.gov; don.wagner@mail.house.gov; cvo@cvo-pub.com; Celeste.Stenac@mail.house.gov; wmckhann@aol.net; Marcie Calvo - CALTRANS DIST 11 <Marcie.Calvo@dot.ca.gov>; Julie Baker <julie@preservationtechnologies.com>; Bancroft@gmail.com

<frankbrown@gmail.com>; Quechan Indian Tribe <tribalsecretary@quechantribe.com>; ljbirdsinger@aol.com; lp13boots@aol.com; Thomas tortez@torresmartinez-nsn.gov; Joseph mirelez@torresmartinez nsn.gov; katy.sanchez@nahc ca.gov
Cc: Joe Hernandez <JoeHernandez@co.imperial ca.us>; Michael Abraham <MichaelAbraham@co.imperial ca us>; Carina Gomez <CarinaGomez@co.imperial ca.us>; Gabriela Robb <GabrielaRobb@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial ca.us>; Kimberly Noriega <KimberlyNoriega@co.imperial ca.us>; Rosa Soto <RosaSoto@co imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca us>
Subject: RE: Request for Review and Comment Letter TR00992

Good Afternoon

Please see attached Request for Comments Packet for **Tentative Tract Map #00992.** Comments are due by **December 7, 2020 at 5:00 PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments Packet is being sent to you via this email.

Should you have any questions regarding this project, please feel free to contact Planner Joe Hernandez at (442)265-1736 ext. 1748 or submit your comment letters to

icpdscommentletters@co.imperial.ca.us

Thank you,

Maria Scoville
Senior Planner
(442) 265-1736

mariascoville@co.imperial.ca.us

PLEASE BE AWARE THAT DUE TO THE COVID-19, we are extremely short staffed and are experiencing longer zoning review and plan check processing times on all permit applications (including inspections). We do apologize for any inconvenience this may cause.

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December 2, 2020

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IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Mr. Joe Hernandez
Planner IV
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Tentative Tract Map No. 00992

Dear Mr. Hernandez:

On November 20, 2020, the Imperial Irrigation District received from the Imperial County Planning & Development Services Dept. a request for agency comments on Tentative Tract Map no. 00992. The applicant proposes to create five lots for multi-family housing. The parcel to be subdivided is located at 185 Willowbrook Way in Heber, California (APN 054-601-016-000).

The Imperial Irrigation District has reviewed the information and has the following comments:

1. To initiate the process to obtain electric service for phase 1 of the project (60 apartment units), the applicant should be advised to contact Joel Lopez, the IID Service Planner for the area, at (760) 482-3444 or e-mail Mr. Lopez at jflopez@iid.com. In addition to submitting a formal application (available for download at the district website at http://www.iid.com/home/showdocument?id=12923), the applicant will be required to submit a complete set of approved plans, including any photo-voltaic installation drawings for the PV component of the project, (hard copy and CAD files); project schedule, estimated in-service date, electrical loads, panel size, panel locations, voltages, accessibility to operate and maintain IID equipment, and the applicable fees, permits, easements and environmental compliance documentation pertaining to the provision of electrical service to the project. The applicant shall be responsible for all costs and mitigation measures related to providing electrical service to the project.

2. Please note that electrical capacity is limited in the area. A circuit study may be required. Any improvements identified in the circuit study to allow electrical service to the development project shall be the financial responsibility of the applicant.

3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). The IID encroachment permit application and instructions are available for download at the district website https://www.iid.com/about-iid/department-directory/real-estate. The IID Real Estate

Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements.

4. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IID's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.

5. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. **Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent**.

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Sandra Blain – Deputy Manager, Energy Dept.,
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

Kimberly Noriega

From: Quechan Historic Preservation <historicpreservation@quechantribe.com>
Sent: Friday, December 4, 2020 12:47 PM
To: ICPDSCommentLetters
Subject: Tentative Tract Map #00992 in Imperial County Assessor Parcel Number 054-601-016-000

Follow Up Flag: Follow up
Flag Status: Flagged

CAUTION: This email originated outside our organization; please use caution.

This email is to inform you that we do not wish to comment on this project.

H. Jill McCormick, M.A.
Historic Preservation Officer
Ft. Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366
Office: 760-572-2423
Cell: 928-261-0254

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Attachment "A"

MIRALUZ/HEBER MEADOWS AFFORDABLE HOUSING PROJECT

AIR QUALITY and GREENHOUSE GAS STUDY

Prepared for:

Chelsea Investment Corporation
6339 Paseo Del Lago
Carlsbad, CA 92011

Prepared by:

BPG
BIRDSEYE
PLANNING GROUP

May 2021

AIR QUALITY REPORT

MIRALUZ/HEBER MEADOWS AFFORDABLE HOUSING PROJECT

Prepared for:

Chelsea Investment Corporation
6339 Paseo Del Lago
Carlsbad, CA 92011

Prepared by:

Birdseye Planning Group, LLC
P.O. Box 1956
Vista, CA 92056
760-712-2199

May 20, 2021

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APPENDICES

CHAPTER 1.0
INTRODUCTION

1.1 INTRODUCTION

The proposed project would subdivide APN 054-601-016 into five lots for the purpose of constructing a phased affordable housing project. A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was comprised of 86 acres located west of Pitzer Road, south of East Correll Road, east of the Union Pacific Railroad tracks and north of 6th Street. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The current project site was part of the larger project area but was never developed.

A condition of approval associated with the Heber Meadows project required improvements to the State Route (SR) 86/Pitzer Road intersection located approximately 2,000 feet south of the site. The northern Pitzer Road leg from SR-86 is currently closed. The southern Pitzer Road leg is stop controlled. The east/west movement is uncontrolled under existing conditions. Four alternatives were evaluated. The selected alternative would widen the existing intersection, construct the northbound connection to Pitzer Road and install a new signal. The existing roadway would be widened within the existing County of Imperial right of way (ROW) along Pitzer Road and California Department of Transportation (Caltrans) ROW along SR 86.

The purpose of this air quality analysis is to describe the existing air quality in the project area; identify the applicable federal, state, and local air quality regulations; identify the potential air quality impacts of the proposed project; and demonstrate conformity of the project with the State Implementation Plan (SIP), as required by the federal Clean Air Act (CAA). This report also identifies measures to minimize pollutant emissions that could occur during project construction.

1.2 REGIONAL CONFORMITY

Local control over air quality management is provided by the California Air Resources Board (ARB) through county-level or regional (multi-county) Air Pollution Control Districts (APCDs).

The ARB establishes air quality standards and is responsible for control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 14 air basins statewide. The project site is located within the Salton Sea Air Basin (Basin), which includes all of Imperial County and a portion of central Riverside County. Air quality conditions in the Imperial County portion of the Basin are under the jurisdiction of the Imperial County APCD (ICAPCD). The remainder of the Basin is managed by the South Coast Air Quality Management District. The ICAPCD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." Table 1-1 shows the Salton Sea Air Basin attainment status for the national and state standards.

Table 1-1
Imperial County Air Quality Standard Attainment Status

Pollutant	California Ambient Air Quality Standards	National Ambient Air Quality Standards
Ozone (O_3)	Nonattainment	Nonattainment - Moderate
Carbon Monoxide (CO)	Attainment	Unclassified/Attainment
Respirable Particulate Matter (PM_{10})	Nonattainment	Nonattainment - Serious
Fine Particulate Matter ($PM_{2.5}$)[1]	Unclassified[2]	Unclassified/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/Attainment
Lead (Pb)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Sulfates	Attainment	No Federal Standards
Vinyl Chloride	Unclassified	
Hydrogen Sulfide (H_2S)	Attainment	
Visibility Reducing Particles	Unclassified	

[1] Part of Imperial County is designated nonattainment for the NAAQS; however, the nonattainment area does not include the project location
[2] Insufficient data to designate area or designations have yet to be made.

The Basin in which the project area is located, is designated non-attainment area for the federal and state standards for ozone and PM_{10}. The Basin is in attainment or unclassified for the remaining pollutants.

The Clean Air Act (CAA) requires a demonstration that federal actions conform to the State Implementation Plan (SIP) and similar approved plans in areas that are designated as nonattainment or maintenance for criteria air pollutants. Transportation measures are analyzed for

conformity with the SIP as part of regional transportation plans (RTPs) and regional transportation improvement programs (RTIPs). The RTIP is the implementing document for the RTP.

The proposed SR-86/Pitzer Road intersection improvements would be funded by the project applicant as a condition of approval for the Heber Meadows (Miraluz) affordable housing project. Thus, federal conformity requirements do not apply. Further, the project is an intersection signalization and reconfiguration. Per 40 CFR Chapter 1, Section 93.127, Table 3, the project is exempt from a regional emissions analysis. The information provided herein is for California Environmental Quality Act (CEQA) compliance purposes.

1.3 PROJECT DESCRIPTION

The proposed project would subdivide APN 054-601-016 into five lots for the purpose of constructing a phased affordable housing project. A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was comprised of 86 acres located west of Pitzer Road, south of East Correll Road, east of the Union Pacific Railroad tracks and north of 6th Street. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The current project site was part of the larger project area but was never developed.

As stated, the County of Imperial included improvements the SR-86/Pitzer Road intersection as a condition of approval for the Heber Meadows development project. To date, the project has constructed 178 of the 219 lots approved in 2005. The subject property was never developed nor were conditioned improvements to the SR-86/Pitzer Road intersection completed. The project would construct 320 multifamily units on a 16-acre portion of the Heber Meadows site. The total units would exceed those approved in 2005; thus, the project is being evaluated as a standalone project subject to the discretionary review process. Further, the County of Imperial is enforcing the approval condition mandating improvements to the SR-86/Pitzer Road intersection.
The SR-86/Pitzer Road intersection is currently a three-leg intersection, with stop control on northbound Pitzer Road. Currently, the north leg does not exist. Hence, the existing intersection geometry is as follows:

- Northbound: 1 shared left / right lane
- Westbound: 1 shared through / left-turn lane
- Eastbound: 1 shared through / right lane

Linscott, Law and Greenspan, Engineers (LLG) prepared an Intersection Control Evaluation (ICE) (March 2021) for the subject intersection. The analysis was prepared to objectively evaluate and screen intersection control alternatives. The intersection traffic control options which were assessed are minor-street stop, all-way stop, signalization, and roundabout control. The intersection control alternatives were analyzed using Year 2040 (Horizon Year) forecast traffic volumes including traffic generated by the planned Heber Meadows project.

The fourth (north) leg will be provided at this intersection and will provide direct access from SR 86 to the north, connecting to Correll Road. The following intersection geometry is proposed at the SR 86 / Pitzer Road intersection:

- Southbound: One left turn lane and one shared through / right-turn lane (New north leg)
- Westbound: One left turn lane, one through lane and one right-turn lane
- Northbound: One left turn lane and one shared through / right-turn lane
- Eastbound: One left turn lane and one shared through / right-turn lane

With these improvements and the addition of a new traffic signal, the intersection would complete the street network serving the project site and address operational deficiencies associated with project build out and cumulative traffic volumes.

Figure 1 shows the project site. Figure 2 shows the Miraluz/Heber Meadows site plan (Phase I). Figure 3 shows the proposed Pitzer Road/SR-86 intersection geometrics.

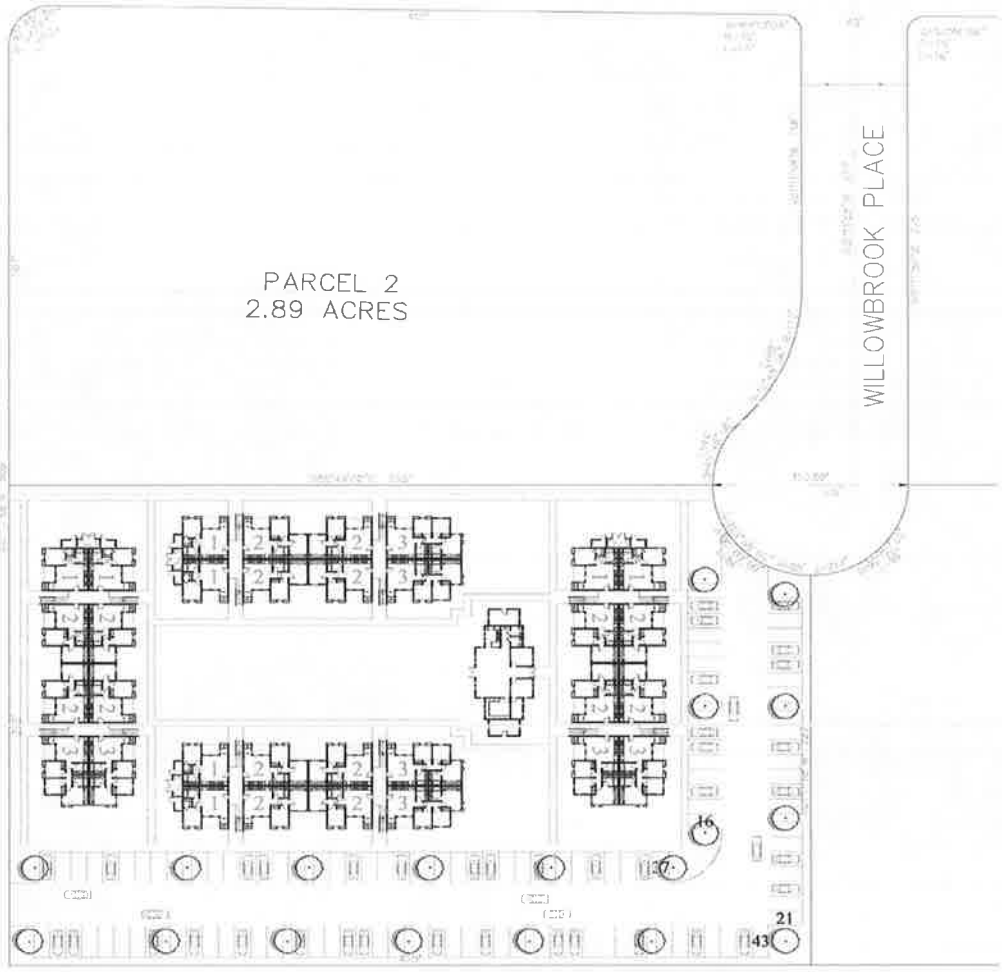
1.4 SENSITIVE RECEPTORS

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. Structures that house these persons, i.e. schools, hospitals, and nursing homes are defined as sensitive receptors. Recreational land uses such as parks are also considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. Sensitive receptors located in proximity to the project area are listed in Table 1-2.

Table 1-2
Sensitive Receptors

Receiver	Street Address	City/Town	Distance (feet)
Single Family Residences	Harmony Way	Heber	315
Single Family Residences	SR-86 southwest of Pitzer Road intersection	Heber	65

Figure 1—Project Vicinity ▭ **- Project Site** ● **- SR-86/Pitzer Road Intersection**



SITE PLAN

BUILDING DATA		PARKING DATA
16 1BR/1BA	583 SQ. FT	16/1BR X 1.4 = 22.8 PARKING SPACES
32 2BR/1BA	742 SQ. FT	32/2BR X 1.4 = 44.8 PARKING SPACES
16 3BR/2BA	938 SQ. FT	16/3BR X 1.4 = 22.4 PARKING SPACES
64 TOTAL UNITS		90.4 REQUIRED PARKING SPACES 117 PROVIDED PARKING SPACES
COMMUNITY BUILDING WITH LAUNDRY RM 1,960 SQ. FT.		

HEBER MEADOWS
CHELSEA INVESTMENT CORPORATION

THE McKINLEY ASSOC., INC.
ARCHITECTURE & PLANNING

MARCH 24, 2021

Figure 2—Site Plan

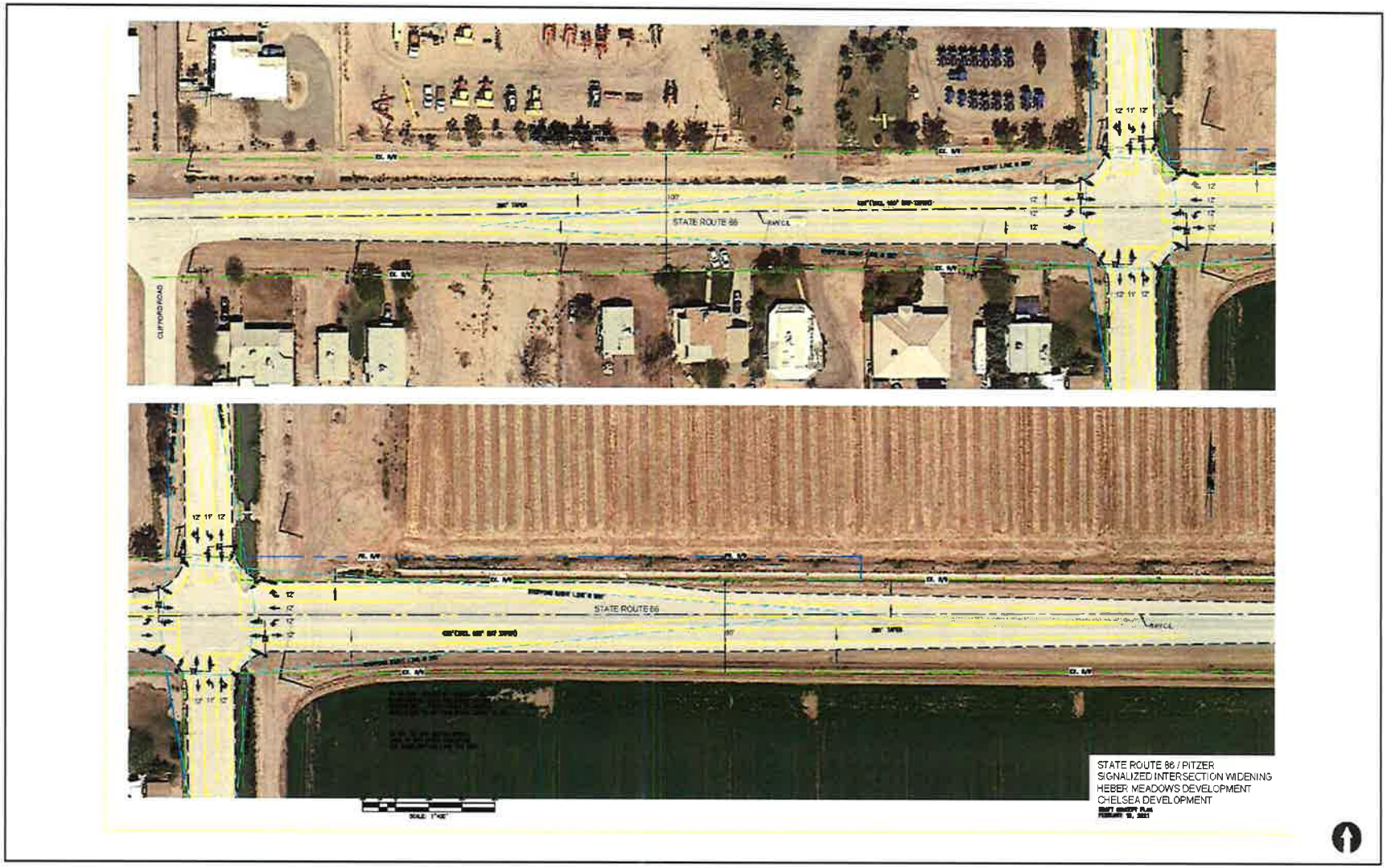


Figure 3—Conceptual Signalized Control

CHAPTER 2.0
AIR POLLUTANTS

"Air Pollution" is a general term that refers to the presence of one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation.

Concentrations of the following air pollutants: ozone (O_3), CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$, and lead are used as indicators of ambient air quality conditions. These air pollutants are commonly referred to as "criteria air pollutants" because USEPA regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. These air pollutants are the most prevalent air pollutants known to be deleterious to human health, and there is extensive documentation available on health effects of these pollutants.
A brief description of each criteria air pollutant, including source types and health effects is provided below. In addition to criteria air pollutants, toxic air contaminants (TACs) and asbestos are air pollutants of concern.

2.1 CARBON MONOXIDE

Carbon monoxide is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile exhaust. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

2.2 OZONE

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_x) and reactive organic gases (ROG). Nitrogen oxides are formed during the combustion of fuels, while reactive organic compounds are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Organic compound precursors of ozone are routinely described by a number of variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). While most of these differ in some significant way from a chemical perspective, from an air quality perspective two groups are important: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (HC, RHC, ROG, ROC, and VOC).

2.3 NITROGEN DIOXIDE

Nitrogen dioxide (NO_2) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NOx. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

2.4 SULFUR DIOXIDE

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

2.5 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, as discussed in detail below, 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 manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the 4air. In the early 1970s, USEPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. USEPA banned the use of leaded gasoline in highway vehicles in December 1995 (USEPA 2008b).

As a result of USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95 percent between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (USEPA 2008b).

2.6 PARTICULATE MATTER

PM_{10} is particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both PM_{10} and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

2.7 SULFATES

Sulfates are the fully oxidized ionic form of sulfur produced when sulfur dioxide is fully oxidized in the atmosphere. Sulfates are produced by emissions from automobiles, power plants, and industrial activity, and contribute to general atmospheric haziness. Typical health effects associated with exposure to sulfates include respiratory illness and an increased risk of cardio-pulmonary disease.

2.8 VINYL CHLORIDE

Vinyl chloride is an artificially created colorless gas with a mild, slightly sweet odor. The gas is used in the manufacture of vinyl products, including polyvinyl chloride (PVC) plastic. Vinyl

chloride emissions are produced from the vinyl manufacturing process as well as from the breakdown of vinyl products in landfills and hazardous waste sites. The health effects associated with vinyl chloride include dizziness, headaches, and drowsiness from short-term exposure, and liver damage and cancer resulting from long-term exposure. In 1990, the California Air Resources Board (CARB) designated vinyl chloride as a toxic air contaminant.

2.9 HYDROGEN SULFIDE

Hydrogen Sulfide (H_2S). H_2S is a naturally occurring, colorless gas that, at low concentrations, produces a distinctive rotten egg odor. At higher concentrations, the gas produces a sweet odor. The gas is produced through the bacteriological breakdown of organic materials as well as some types of geothermal activity. Health effects associated with H2S include exposure to a disagreeable odor, coughing, irritation to eyes, and impairment of the respiratory system.

2.10 VISIBILITY REDUCING PARTICLES

Visibility Reducing Particles. Visibility reducing particles are particulate matter composed of many different substances that are suspended in the atmosphere and contribute to haze and diminished visibility.

2.11 TOXIC AIR CONTAMINANTS

Concentrations of TACs, also referred to as, hazardous air pollutants (HAPs), are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This is in contrast to the criteria air pollutants for which acceptable levels of exposure can be determined and for which ambient standards have been established (see Table 7 in Section 3.1). Most TACs originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., railroads and airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics

The Clean Air Act (CAA) identified 188 compounds as Toxic Air Contaminants (TACs). USEPA has assessed this expansive list of toxics and identified a group of 21 as Mobile Source Air Toxics

(MSATs). The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. USEPA also extracted a subset of this list of 21 compounds that it now labels as the six priority MSATs. These are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

Diesel Exhaust Particulate

According to the *California Almanac of Emissions and Air Quality* (CARB 2008a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. CARB identified diesel PM as a TAC in 1998.

Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, CARB estimated the diesel PM health risk in the SDAB in 2000 to be 420 excess cancer cases per million people. Since 1990, the health risk of diesel PM in the SDAB has been reduced by 52 percent (California Air Resources Board, 2008).

2.12 ASBESTOS

The CAA requires USEPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with CAA Section 112, USEPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first HAPs regulated under this section. On March 31, 1971, USEPA identified asbestos as a hazardous pollutant, and on April

6, 1973, first promulgated the asbestos NESHAP in 40 CFR 61. In 1990, a revised NESHAP regulation was promulgated by USEPA.

The asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the asbestos NESHAP specifies work practices to be followed during demolition and renovation of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the project applicant to notify applicable state and local agencies and/or USEPA regional offices before all demolitions or before construction that contains a certain threshold amount of asbestos. No structures would be affected by the project; thus, no asbestos would be encountered during construction.

Naturally Occurring Asbestos (NOA)-bearing Serpentine

Serpentine is a mineral commonly found in seismically active regions of California, usually in association with ultramafic rocks and along associated faults. Certain types of serpentine occur naturally in a fibrous form known generically as asbestos. Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about health hazards from activities that disturb asbestos-bearing rocks and soil. In response, CARB revised their asbestos limit for crushed serpentines and ultramafic rock in surfacing applications from 5 percent to less than 0.25 percent and adopted a new rule requiring best practices dust control measures for activities that disturb rock and soil containing NOA (CDC 2000).

According to *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos* (CDC 2000), the project site is not located in an area that is likely to contain NOA. Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

CHAPTER 3.0
APPLICABLE STANDARDS

3.1 FEDERAL AND STATE STANDARDS

At the federal level, USEPA has been charged with implementing national air quality programs. USEPA's air quality mandates are drawn primarily from the CAA, which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required USEPA to establish National Ambient Air Quality Standards (NAAQS). As shown in Table 3, USEPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a SIP. The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures that would reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. USEPA must review all state SIPs to determine whether they conform to the mandates of the CAA and the amendments thereof, and to determine whether implementing them will achieve air quality goals.

CARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementation of the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California Ambient Air Quality Standards (CAAQS) (Table 3). CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained through interpretation of the health effects studies considered during the standard-setting process. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals. Federal and state standards are shown in Table 3-1.

Table 3-1
State and Federal Ambient Air Quality Standards

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS[1]		NATIONAL STANDARDS[2]		
		Concentration[3]	Method[4]	Primary[3, 5]	Secondary[3, 6]	Method[7]
Ozone[8] (O_3)	1 hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 hours	0.070 ppm (137µg/m³)		0.070 ppm (137 µg/m³)		
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m³)	--	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
Nitrogen Dioxide (NO_2)[10]	Annual Average	0.030 ppm (57 µg/m³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 hour	0.18 ppm (339 µg/m³)		100 ppb (188 µg/m³)	--	
Sulfur Dioxide (SO_2)[11]	Annual Average	--	Ultraviolet Fluorescence	0.03 ppm (80 µg/m³)	--	Pararosaniline
	24 hours	0.04 ppm (105 µg/m³)		0.14 ppm (365 µg/m³)	--	
	3 hours	--		--	0.5 ppm (1300 µg/m³)	
	1 hour	0.25 ppm (655 µg/m³)		75 ppb (196 µg/m³)	--	

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS[1]		NATIONAL STANDARDS[2]		
		Concentration[3]	Method[4]	Primary[3, 5]	Secondary[3, 6]	Method[7]
Respirable Particulate Matter (PM_{10})[9]	24 hours	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	150 µg/m³	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		--	--	
Fine Particulate Matter ($PM_{2.5}$)[9]	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12 µg/m³	15 µg/m³	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 µg/m³	Same as Primary Standard	
Sulfates	24 hours	25 µg/m³	Ion Chromatography	--	--	--
Lead[12, 13] (Pb)	30-day Average	1.5 µg/m³	Atomic Absorption	--	--	High Volume Sampler and Atomic Absorption
	Calendar Quarter	--		1.5 µg/m³	Same as Primary Standard	
	3-month Rolling Average	--		0.15 µg/m³		
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence	--	--	--
Vinyl Chloride[12]	24 hours	0.010 ppm (26 µg/m³)	Gas Chromatography	--	--	--

Notes:
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
Source: California Air Resources Board 2017

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. 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 standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. 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.
14. In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

3.2 REGIONAL AUTHORITY

Air Quality Attainment Plan

ICAPCD is the local air pollution control agency for Imperial County and the southern portion of the Salton Sea Air Basin. The ICAPCD has primary responsibility for ensuring that state and federal air quality standards are attained and maintained within the ICAPCD's jurisdiction. Thus, the ICAPCD is responsible for preparing clean air plans, issuing construction and operation permits, monitoring ambient air quality, as well as developing and implementing rules and regulations that govern air quality within Imperial County. The ICAPCD meets its regulatory responsibilities through the State of California State Implementation Plan (SIP). The ICAPCD adopted its first SIP in 1971 and has prepared periodic updates to the SIP. SIPs for controlling PM_{10}, ozone, and a reasonably available control technology SIP are in place for Imperial County and constitute the Air Quality Attainment Plan (AQAP) for Imperial County.

A SIP revision for revised rules under ICAPCD Regulation VIII for fugitive dust PM_{10} was reviewed by EPA and the final rule was signed on March 27, 2013 and published in the Federal Register (Federal Register 2013). The ICAPCD adopted the rules on October 16, 2012 to regulate PM_{10} emissions from sources of fugitive dust (e.g., unpaved roads and disturbed soils in open and agricultural areas). CARB submitted these rules to EPA for approval on November 7, 2012; EPA proposed approval of these revisions to the ICAPCD portion of the California SIP on January 7, 2013. Rules and regulations promulgated by the ICAPCD and in the SIP revision applicable to the proposed project include the following:

- ICAPCD Rule 207.C.1, New and Modified Stationary Source Review (best available control technologies [BACT]), requires that any new or modified emissions unit that has a potential to emit 25 pounds per day or more of any nonattainment pollutant or its precursors, or 55 pounds per day of H_2S, must include BACT as a part of the project.

- ICAPCD Rule 400, Nuisances, forbids the emission of air contaminants or other materials that would cause a nuisance to the public, including non-agricultural related odors.
- ICAPCD Rule 800 General Requirements for Control of Fine Particulate Matter (PM-10), requires actions to prevent, reduce, or mitigate PM-10 emissions from anthropogenic (man-made) Fugitive Dust (PM-10) sources generated within Imperial County.
- ICAPCD Regulation VIII, Rule 801 (Construction and Earthmoving Activities) establishes a 20 percent opacity limit, requires the implementation of a dust management control plan for all nonresidential projects of 5 acres or more, and requires compliance with other portions of Regulation VIII regarding bulk materials (Rule 802), carry-out and track-out (Rule 803), and paved and unpaved roads (Rule 805). The rule exempts single-family homes and waives the 20 percent opacity limit in winds over 25 miles per hour (mph) under certain conditions. To comply with this reguation, the applicant would implement Mitigation Measure AQ-1 which requires preparation of a Fugitive Dust Suppression Plan to minimize dust generated during construction and ground disturbing activities.
- ICAPCD Rule 804 Open Areas, requires actions to prevent, reduce or mitigate the amount of fine Particulate Matter (PM-10) emissions generated from Open Areas. Open areas are defined as any open area having 0.5 acres or more within urban areas, or 3.0 acres or more within rural areas; and contains at least 1,000 square feet of disturbed surface area.

On October 23, 2018 the Imperial County Air Pollution Control District Board of Directors approved the Imperial County 2018 Redesignation Request and Maintenance Plan for PM_{10}. The California Air Resources Board during a December 13, 2018 Public Hearing approved the Imperial County 2018 Redesignation Request and Maintenance Plan for PM_{10}.

ICAPCD adopted the 2013 $PM_{2.5}$ plan on December 2, 2014. The plan was transmitted to CARB on December 9, 2014. CARB reviewed and approved the plan on December 18, 2014 as a revision to the California State Implementation Plan for Imperial County. The plan was submitted to the U.S. EPA on January 9, 2015 and is pending approval.

CHAPTER 4.0
EXISTING CONDITIONS

4.1 ENVIRONMENTAL SETTING, CLIMATE, AND METEOROLOGY

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

The proposed project is located in Imperial County, the southeastern most county in California. Imperial County is one of the hottest and driest parts of California and is located in a low latitude desert characterized by hot, dry summers and relatively mild winters. Average annual precipitation within Imperial County is less than 3 inches. The normal maximum temperature in January is approximately 70 degrees Fahrenheit (°F), and the normal minimum temperature is approximately 41°F. In July, the normal maximum temperature can exceed 107°F, while the normal minimum temperature is approximately 75°F. Relative humidity in the summer is low, averaging 30 to 50 percent in the early morning and 10 to 20 percent in the afternoon. During the hottest part of the day, the relative humidity can drop below 10 percent. However, the effect of extensive agricultural operations in the widely irrigated Imperial Valley tends to increase local humidity. The prevailing weather conditions promote intense heating during the day in summer with cooling at night. During the fall, winter, and spring, regional winds tend to come from the northwest. During the summer, winds tend to come from the southeast.

4.2 REGIONAL AND LOCAL AIR QUALITY

The ICAPCD operates a network of 5 ambient air monitoring stations throughout Imperial County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants to determine whether the ambient air quality meets the California and federal standards. The air quality monitoring station located nearest to the project site is located at 1020 Ethel Street in Calexico approximately 4.2 miles southeast of the project site. Table 4-1 provides a summary of monitoring data at the Calexico Station for ozone and PM_{10}. As referenced, the Salton Sea Basin is a nonattainment area for these two pollutants. $PM_{2.5}$ data are also provided for reference purposes.

Both CARB and USEPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the

areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. If an area is redesignated from nonattainment to attainment, the CAA requires a revision to the SIP, called a maintenance plan, to demonstrate how the air quality standard will be maintained for 10 years.

Table 4-1
Ambient Air Quality Data

Pollutant	2017	2018	2019
Ozone, ppm - Worst Hour	0.092	0.084	0.089
Number of days of Federal exceedances (>0.070 ppm)*	17	9	17
Particulate Matter <10 microns, µg/m3 Worst 24 Hours	409.7	407.5	141.1
Number of samples of State exceedances (>50 µg/m3)	152	176	108
Number of samples of Federal exceedances (>150 µg/m3)	6	9	0
Particulate Matter <2.5 microns, µg/m3 Worst 24 Hours	49.1	90.6	53.1
Number of samples of State exceedances (>50 µg/m3)	*	*	*
Number of samples of Federal exceedances (>150 µg/m3)	5	8	1

Data obtained from the monitoring site located at 1029 Ethel Street, Calexico, CA.
Source: California Air Resources Board, 2017, 2018, 2019 Annual Air Quality Data Summaries available at https://www.arb.ca.gov/adam/topfour/topfour2.php

4.3 ROADWAYS AND TRAFFIC

The primary roadways within the project area are Pitzer Road and State Route 86.

Pitzer Road. Pitzer Road is classified as a 4-Lane Major Road in the Imperial County Circulation and Scenic Highways Element a two-lane north-south facility. Currently, in the study area, Pitzer is built as a 2-Lane Road between McCabe Road and just north of, but not connected to SR 86. Pitzer Road continues south of SR 86 as a 2-Lane Road. Bike lanes or bus stops are not provided. Curb and gutter and sidewalks are only provided intermittently on the west side of Pitzer Road between Correll Road and Meridian Street. Curbside parking is prohibited along both sides of the roadway. The speed limit is not posted.

State Route 86. State Route 86 (Heber Road) is classified as a 6-Lane Prime Arterial between Dogwood Road and SR 111 in the in the Imperial County Circulation and Scenic Highways Element. Currently, it is built as 2-Lane Road. Bike lanes or bus stops are not provided and the speed limit is posted at 55 mph. Curbside parking is prohibited along both sides of the roadway.

CHAPTER 5.0
FUTURE AIR EMISSIONS

5.1 METHODOLOGY AND SIGNIFICANCE THRESHOLDS

This air quality analysis conforms to the methodologies recommended in the ICAPCDs *CEQA Air Quality Handbook* (amended November 2007). The handbook includes thresholds for emissions associated with both construction and continued operation of facility. All emissions associated with construction vehicle and equipment operations were calculated using the California Emissions Estimator Model (CalEEMod) software version 2016.3.2. As referenced, construction emissions would be associated with clearing, grading, excavation and construction of the cells, roads, berms, levees and water diversion infrastructure. These emissions would consist of diesel exhaust and dust emissions. Construction equipment that would generate criteria air pollutants includes excavators, graders, dump trucks, and loaders. It was assumed that all construction equipment used would be diesel-powered. Construction emissions associated with development of the proposed project were estimated based on the types of equipment (including the number) that would be used on-site during construction.

Regional Thresholds. Based on Appendix G of the *CEQA Guidelines*, a project would have a significant air quality impact if it would:

a) *Conflict with or obstruct implementation of the applicable air quality plan;*
b) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;*
c) *Expose sensitive receptors to substantial pollutant concentrations; or*
d) *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.*

New development with a potential to emit criteria pollutants below significance levels defined by the Imperial County APCD is referred to as a "Tier I project," and is considered by the Imperial County APCD to have less than significant potential adverse impacts on local air quality. For Tier I projects, the project proponent should implement a set of feasible "standard" mitigation measures (determined by the Imperial County APCD) to reduce the air quality impacts to less than significant. A "Tier II project" is one whose emissions exceed any of the thresholds. Its impact is significant and the project proponent should select and implement all feasible "discretionary" mitigation measures (as determined by the Imperial County APCD) in addition to the standard measures. Tier I and Tier II thresholds are shown in Table 5-1.

Table 5-1
ICAPCD Tier I and Tier II Daily Operational Thresholds

Pollutant	Tier I	Tier II
NOx and ROG	Less than 137 lbs/day	Greater than 137 lbs/day
PM_{10} and SOx	Less than 150 lbs/day	Greater than 150 lbs/day
CO and $PM_{2.5}$	Less than 550 lbs/day	Greater than 550 lbs/day

ROG = reactive organic gas; NOX = oxides of nitrogen; CO = carbon monoxide; PM10 = particulate matter with an aerodynamic diameter 10 microns or less; lbs/day = pounds per day
SOURCE: Imperial County APCD 2017

The ICAPCD has developed specific quantitative thresholds that apply to short-term construction activities and project operation. The thresholds are shown in Table 5-2.

Table 5-2
ICAPCD Daily Emission Thresholds

Pollutant	Construction (pounds/day)	Operation (pounds/day)
Reactive Organic Gases	75	55
Nitrogen Oxide	100	55
Carbon Monoxide	550	550
Particulate Matter 10	150	150
Particulate Matter 2.5	N/A	55*
Sulfur Oxides	N/A	150

Source: ICAPCD CEQA Handbook, 2007

Note: The ICAPCD has not adopted a significance threshold for operational or construction related emission of PM2.5 or construction related emissions of SOx. Recent projects in the ICAPCD have used a PM2.5 threshold for operation emissions of 55 pounds per day based on the SCAQMD's Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds (SCAQMD 2006).

NA = Construction thresholds for PM2.5 and SOx are not applicable.

5.2 OPERATIONAL EMISSIONS

Regional Pollutant Emissions

Table 5-3 summarizes emissions associated with operation of the 320-unit affordable housing project. As referenced, these are cumulative emissions as build out of the five phases. Phase I would include 64 units. Emissions include forecast build out traffic volumes for the proposed housing project. The SR-86/Pitzer Road intersection improvements would not generate new emissions. The ICAPCD thresholds for ROG, NO_X, CO, SO_X, PM_{10} or $PM_{2.5}$ would not be exceeded. Therefore, the project's regional air quality impacts (including impacts related to criteria pollutants, sensitive receptors and violations of air quality standards) would be less than significant.

Table 5-3
Estimated Operational Emissions

	Estimated Emissions (lbs/day)					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Full Build out (320 units)	16.0	39.98	113.3	0.2	14.0	4.0
ICAPCD Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Summer emissions shown.

5.3 CONSTRUCTION IMPACTS

Project construction would generate temporary air pollutant emissions. These impacts are associated with fugitive dust (PM_{10} and $PM_{2.5}$) and exhaust emissions from heavy construction vehicles. Construction would generally consist of site preparation, grading, construction of the building pads and internal parking areas. Emission estimates include those associated with construction of the proposed SR-86/Pitzer Road intersection improvements. For modeling purposes, it was assumed one acre of area would be disturbed daily.

As described, the applicant is intending to construct Phase I first with future phases developed based on market demand. To conservatively estimate grading emissions and for fugitive dust

control purposes, it was assumed that the entire 16-acre site is graded and that all 320 units are constructed. For modeling purposes, it was assumed that all spoils would be stored on-site and used for cover material; thus, no off-site haul trips would occur. Construction emission estimates are shown in Table 5-4.

Table 5-4
Estimated Maximum Daily Construction Emissions

Construction Phase	Maximum Emissions (lbs/day)					
	ROG	NO_x	SOx	CO	PM_{10}	$PM_{2.5}$
Project Construction – *2022*	4.1	38.9	0.07	39.4	9.8	5.9
Project Construction - 20*23*	55.4	22.0	0.07	38.1	4.2	1.6
ICAPCD Regional Thresholds	*75*	*100*	*No Standard*	*550*	*150*	*No Standard*
Threshold Exceeded	**No**	**No**	**No**	**No**	**No**	**No**

The emissions shown in Table 5-4 are mitigated to primarily control fugitive dust (PM_{10}) emissions during construction and assume exposed soil areas would be watered twice daily. To minimize fugitive dust and general construction emissions, the applicant would be required to implement fugitive dust control measures per ICAPCD Rules 801 and 804 as referenced herein. The fugitive dust control plan and related requirements to control fugitive dust emissions during construction are addressed as follows and assumed to be conditions of approval for the project:

> **AQ-1a:** Prior to commencing construction, the project applicant will be required to submit a Dust Control Plan to the ICAPCD for approval. The Dust Control Plan will identify all sources of PM_{10} emissions and associated mitigation measures during the construction and operational phases (see Rule 801 F.2). The applicant shall submit a "Construction Notification Form" to the ICAPCD 10 days prior to the commencement of any earthmoving activity. The Dust Control Plan submitted to the ICAPCD shall meet all applicable requirements for control of fugitive dust emissions, including the following measures designed to achieve the no greater than 20-percent opacity performance standard for dust control and address the following parameters:

- All disturbed areas, including bulk material storage that is not being actively used, shall be effectively stabilized; and visible emissions shall be limited to no greater than 20-percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material, such as vegetative groundcover. Bulk material is defined as earth, rock, silt, sediment, and other organic and/or inorganic material consisting of or containing particulate matter with 5 percent or greater silt content. For modeling purposes, it was assumed that watering would occur twice daily.

- All on-site unpaved roads segments or areas used for hauling materials shall be effectively stabilized. Visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by restricting vehicle access, paving, application of chemical stabilizers, dust suppressants and/or watering.

- The transport of bulk materials on public roads shall be completely covered, unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks shall be cleaned and/or washed at the delivery site after removal of bulk material, prior to using the trucks to haul material on public roadways.

- All track-out or carry-out on paved public roads, which includes bulk materials that adhere to the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto the pavement, shall be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area.

- Movement of bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers, or by sheltering or enclosing the operation and transfer line except where such material or activity is exempted from stabilization by the rules of ICAPCD.

AQ-1b: Each project proponent shall implement all applicable standard measures for construction combustion equipment for the reduction of excess NO_X emissions as contained in the Imperial County CEQA Air Quality Handbook and associated regulations. These measures include:

- Use alternative-fueled or catalyst-equipped diesel construction equipment, including all off-road and portable diesel-powered equipment.

- Minimize idling time, either by shutting equipment off when not in use or reducing the time of idling to five minutes at a maximum.

- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use. Replace fossil-fueled equipment with electrically driven equivalents (assuming powered by a portable generator set and are available, cost effective, and capable of performing the task in an effective, timely manner).

- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing construction activity during the peak hour of vehicular traffic on adjacent roadways.

- Implement activity management (e.g., rescheduling activities to avoid overlap of construction phases, which would reduce short-term impacts).

With implementation of AQ1a and AQ1b, construction related impacts would be less than significant. No additional mitigation would be required.

5.4 CUMULATIVE IMPACTS

Operational emission include build out traffic conditions forecast for the year 2040. As shown, the project would not exceed operational thresholds established by ICAPCD for the evaluation of project-specific impacts. Therefore, the project would not result in a cumulative impact to air quality.

CHAPTER 6.0
GREENHOUSE GAS ANALYSIS

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). 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 climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane (CH_4) has a GWP of 28, meaning its global warming effect is 28 times greater than carbon dioxide on a molecule per molecule basis (IPCC, 2014).

Total U.S. GHG emissions were 6,577 MMT CO_2E in 2019 (U.S. EPA, February 2021). Total U.S. emissions decreased from 2018 to 2019 by 1.8 percent primarily as a result of less fossil fuel combustion. Total U.S. emissions have increased by 2.0 percent from 1990 to 2019, down from a high of 15.7 percent above 1990 levels in 2007. Emissions decreased from 2018 to 2019 by 1.7 percent (116.0 MMT CO2e). Net emissions (including sinks) were 5,788 MMT CO2e. Overall, net emissions decreased 1.8 percent from 2018 to 2019 and decreased 12.9 percent from 2005 levels. The decline reflects many long-term trends, including population, economic growth, energy market trends, technological changes including energy efficiency and carbon intensity of energy fuel choices. Between 2018 and 2019, the decrease in total greenhouse gas emissions was largely driven by the decrease in CO2 emissions from fossil fuel combustion. The decrease in CO2 emissions from fossil fuel combustion was a result of a 1.3 percent decrease in total energy use and reflects a continued shift from coal to less carbon intensive natural gas and renewables. (U.S. EPA, February 2021).

In 2018, statewide emissions from GHG emitting activities statewide were 425 million metric tons of carbon dioxide equivalent (MMTCO2e), 0.8 MMTCO2e higher than 2017 levels and 6 MMTCO2e below the 2020 GHG Limit of 431 MMTCO2e. California statewide GHG emissions dropped below the 2020 GHG Limit in 2016 and have remained below the 2020 GHG Limit since then. Transportation emissions decreased in 2018 compared to the previous year, which is the first year over year decrease since 2013. Since 2008, California's electricity sector has followed an overall downward trend in emissions. In 2018, solar power generation has continued to grow. Emissions from high-GWP gases increased 2.3 percent in 2018 (2000-2018 average year-over year increase is 6.8 percent), continuing the increasing trend as Ozone Depleting Substances (ODS) are phased out under the 1987 Montreal Protocol.

The largest source of GHG in California is transportation, contributing 39.9 percent of the state's total GHG emissions. The industrial sector is the second largest source, contributing 21 percent of the state's GHG emissions. California emissions result in part to its geographic size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. In July 2017, California's state legislature passed Assembly Bill (AB) 398 to reauthorize and extend until 2030 the state's economy-wide greenhouse gas (GHG) reduction program. The bill sets a new GHG target of at least 40% below the 1990 level of emissions by 2030.

6.1 REGULATORY OVERVIEW

Federal

Although climate change and greenhouse gas reduction is a concern at the federal level; currently there are no regulations or legislation that have been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level for transportation projects. Neither the USEPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level and will inform the analysis and stewardship needs of project level decision-making. This is because climate change considerations can easily be integrated into planning factors such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by FHWA to lessen climate change impacts correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change. These

strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and Executive Order 13514- Federal Leadership in Environmental, Energy and Economic Performance. Executive Order 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also direct federal agencies to participate in the interagency Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change. On April 2, 2007, in Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the EPA has the authority to regulate greenhouse gases. The Court held that the EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride(SF6)--in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse gas regulations. These steps were outlined by President Obama in a memorandum on May 21, 2010.

The final combined EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On January 24, 2011, the EPA along with the U.S. Department of Transportation and the State of California announced a single timeframe for proposing fuel economy and greenhouse gas standards for model years 2017-2025 cars and light-trucks. Proposing the new standards in the same timeframe (September 1, 2011) signals collaboration that could lead to an extension of the current National Clean Car Program.

On February 18, 2010, the Council on Environmental Quality (CEQ) provided a draft guidance memorandum for public consideration and comment on the ways in which federal agencies can improve their consideration of the effects of greenhouse gas emissions and climate change in evaluations of proposals for federal actions under NEPA (CEQ 2010). CEQ proposes to advise federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect greenhouse gas emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent greenhouse gas emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public.

For long-term actions that have annual direct emissions of less than 25,000 metric tons of carbon dioxide equivalent, CEQ encourages federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of greenhouse gas emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of greenhouse gases.

6-2. CALIFORNIA REGULATIONS

In 2005, former Governor Schwarzenegger issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 states that by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006

CAT Report recommended various strategies that the state could pursue to reduce GHG emissions. These strategies could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture.

Assembly Bill 32 and CARB's Scoping Plan

To further the goals established in EO S-3-05, the Legislature passed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO_2E). CARB's adoption of this limit is in accordance with Health and Safety Code, Section 38550.

Further, in 2008, CARB adopted the Scoping Plan in accordance with Health and Safety Code, Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33%;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions;
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In the Scoping Plan (CARB 2008), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020) absent GHG reducing laws and regulations (referred to as Business-As-Usual (BAU)). To calculate this percentage reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, no further regulatory action would impact vehicle fuel efficiency, and building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (CARB 2011a), CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the BAU conditions. When the 2020 emissions level projection was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009– 2016) and the Renewables Portfolio Standard (RPS) (12% to 20%), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the BAU conditions.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update; CARB 2014). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050" (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32 and noted that California could reduce emissions further by 2030 to levels needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (CARB 2014). Those six areas are (1) energy, (2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), (3) agriculture, (4) water, (5) waste management,

and (6) natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal (CARB 2014).

Based on CARB's research efforts presented in the First Update, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050" (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.
As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO_2E) and the revised 2020-emissions-level projection identified in the 2011 Final
Supplement, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the BAU conditions (CARB 2014).

In January 2017, CARB released, *The 2017 Climate Change Scoping Plan Update (*Second Update; CARB 2017b), for public review and comment. This update proposes CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the Natural and Working Lands, Agriculture, Energy, and Transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2016). The Second Update has not been considered by CARB's Governing Board at the time this analysis was prepared.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Other regulations affecting state and local GHG planning and policy development are summarized as follows:

Assembly Bill 939 and Senate Bill 1374

Assembly Bill 939 (AB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board

to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills.

Senate Bill 1368

Senate Bill 1368 (SB 1368) is the companion Bill of AB 32 and was adopted September, 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007 and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by California Public Utilities Commission (CPUC) and California Energy Commission (CEC).

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is an environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010. Pursuant to the requirements of SB 97 as stated above, on December 30, 2009 the Natural Resources Agency adopted amendments to the state CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.

- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

Senate Bills 1078, 107, and X1-2 and Executive Orders S-14-08 and S-21-09

Senate Bill 1078 (SB 1078) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) changed the target date to 2010. Executive Order S-14-08 was signed on November 2008 and expands the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008 and Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. All buildings for which an application for a building permit is submitted on or after July 1, 2014 must follow the 2013 standards. The 2013 commercial standards are estimated to be 30 percent more efficient than the 2008 standards; 2013 residential standards are at least 25 percent more efficient. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

Senate Bill 375

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

The proposed project is located within the Southern California Association of Governments (SCAG) jurisdiction, which has authority to develop the SCS or APS. For the SCAG region, beginning October 2018, the targets set by CARB are at eight percent below 2005 per capita GHG emissions levels by 2020 and 19 percent below 2005 per capita GHG emissions levels by 2035. In April 2016, SCAG adopted the 2016-2040 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS), which meets the CARB emission reduction requirements. The Housing Element Update is required by the State to be completed within 18 months after RTP/SCS adoption. The current Riverside County Housing Element 2013-2021 was adopted October 7, 2015.

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS or APS. However, CEQA incentivizes, through streamlining and other provisions, qualified projects that are consistent with an approved SCS or APS and categorized as "transit priority projects."

Senate Bill X7-7

Senate Bill X7-7 (SB X7-7), enacted on November 9, 2009, mandates water conservation targets and efficiency improvements for urban and agricultural water suppliers. SB X7-7 requires the Department of Water Resources (DWR) to develop a task force and technical panel to develop alternative best management practices for the water sector. Additionally, SB X7-7 required the DWR to develop criteria for baseline uses for residential, commercial, and industrial uses for both indoor and landscaped area uses. The DWR was also required to develop targets and regulations that achieve a statewide 20 percent reduction in water usage.

California Green Building Standards

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards

that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402(b)(1)). The regulations receive input from members of industry, as well as the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402(d)) and cost effectiveness (California Public Resources Code, Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate new energy efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2019 Title 24 building energy efficiency standards and became effective on January 1, 2020. In general, single-family homes built to the 2019 standards are anticipated to use approximately 7% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2016 standards, and nonresidential buildings built to the 2019 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as "CALGreen," and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings and schools and hospitals. The CALGreen 2019 standards became effective on January 1, 2020. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings;
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance;
- Diversion of 65% of construction and demolition waste from landfills;
- Mandatory inspections of energy systems to ensure optimal working efficiency;
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations; and

- Low-pollutant-emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle board.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs (24 CCR Part 11).

The California Public Utilities Commission, CEC, and CARB also have a shared, established goal of achieving zero net energy (ZNE) for new construction in California. The key policy timelines include the following: (1) all new residential construction in California will be ZNE by 2020, and (2) all new commercial construction in California will be ZNE by 2030 (CPUC 2013).[1] As most recently defined by the CEC in its 2015 Integrated Energy Policy Report (CEC 2015b), a ZNE code building is "one where the value of the energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building" using the CEC's Time Dependent Valuation metric.

6-3. LOCAL REGULATIONS AND CEQA REQUIREMENTS

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents but contain no suggested thresholds of significance for GHG emissions. Instead, they give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. The general approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move the state towards climate stabilization. If a project would generate GHG emissions above the threshold level, its contribution to cumulative impacts would be considered significant. To date, the Bay Area Air Quality Management District (BAAQMD), the South Coast Air Quality Management District (SCAQMD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for

[1] It is expected that achievement of the ZNE goal will occur through revisions to the Title 24 standards.

GHGs. The SCAQMD threshold, which was adopted in December 2008, considers emissions of over 10,000 metric tons CO2E /year to be significant. However, the SCAQMD's threshold applies only to stationary sources and is expressly intended to apply only when the SCAQMD is the CEQA lead agency. Although not formally adopted, the SCAQMD has developed a draft quantitative threshold for all land use types of 3,000 metric tons CO_2E /year (SCAQMD, September 2010). Note that lead agencies retain the responsibility to determine significance on a case-by-case basis for each specific project.

Imperial County has not adopted GHG thresholds or adopted an approved Climate Action Plan that can be used as a basis for determining project significance. The GHG reduction level for the State to reach 1990 emission levels by 2020 was reduced to 21.7 percent from BAU in 2020 in the 2014 First Update to the Scoping Plan to account for slower than projected growth after the 2008 recession (ARB 2014). In addition, the State has reported that the 2016 greenhouse gas inventory was below the 2020 target for the first time and was even lower in 2017 (ARB 2018a). Furthermore, the 2017 Scoping Plan states that California is on track to achieve the 2020 target (ARB 2017a). This means that the State's strategy has successfully reduced GHG emissions while accommodating the growth in population and vehicle miles traveled that occurred in the State since 2005. Thus, as approved by the ICAPCD, the analysis of the project's reduction from BAU based on build out emissions in 2023 compared with the 21.7 percent reduction is used as one measure of significance. Additional discussion is provided herein that addresses project consistency with the AB 32 Scoping Plan and SB 32 Scoping Plan Update.

6.4 THRESHOLDS OF SIGNIFICANCE

Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions in March 2010. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project. According to the adopted CEQA Guidelines, impacts related to GHG emissions from the proposed project would be significant if the project would:

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

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is

cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

6.5 METHODOLOGY

GHG emissions associated with construction (including the SR-86/Pitzer Road improvements) and operation of the proposed project have been estimated using California Emissions Estimator Model (CalEEMod) version 2016.3.2.

Construction Emissions

Construction of the proposed project would generate temporary GHG emissions primarily associated with the operation of construction equipment and truck trips. Site preparation and grading typically generate the greatest emission quantities because the use of heavy equipment is greatest during this phase of construction. Emissions associated with the construction period were estimated based on the projected maximum amount of equipment that would be used on-site at one time. Air districts such as the SCAQMD have recommended amortizing construction-related emissions over a 30-year period to calculate annual emissions. Complete CalEEMod results and assumptions can be viewed in Appendix A.

Operational Emissions

Default values used in CalEEMod version 2016.3.2 are based on the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod provides operational emissions of CO_2, N_2O and CH_4. This methodology has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC; and therefore, is considered reasonable and reliable for use in GHG impact analysis pursuant to CEQA. It is also recommended by CAPCOA (January 2008).

Emissions associated with area sources (i.e., consumer products, landscape maintenance, and architectural coating) were calculated in CalEEMod based on standard emission rates from CARB, USEPA, and district supplied emission factor values (CalEEMod User Guide, 2016). Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2016). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in

California using the average values for Northern and Southern California. Emissions from mobile sources were quantified based on trip generation estimates included in CalEEMod version 2016.3.2 for commercial projects.

Construction Emissions

Construction activity is assumed to occur over a period of approximately 12 months beginning in mid-2022 and concluding in early 2023. Based on CalEEMod results, construction activity for the project, including the SR-86/Pitzer Road improvements would generate an estimated 1,371 metric tons of carbon dioxide equivalent (CO_2E), as shown in Table 6-1. Amortized over a 30-year period (the assumed life of the project), construction of the proposed project would generate 46 metric tons of CO_2E per year.

Operational Indirect and Stationary Direct Emissions

Long-term emissions relate to energy use, solid waste, water use, and transportation. Each source is discussed below and includes the emissions associated with existing development and the anticipated emissions that would result from the proposed project.

Table 6-1
Estimated Construction Related Greenhouse Gas Emissions

Year	Annual Emissions (metric tons CO_2E)
2022	570
2023	801
Total	**1,371**
Amortized over 30 years	**46 metric tons per year**

See Appendix for CalEEMod software program output.

Energy Use. Operation of onsite development would consume both electricity and natural gas (see Appendix for CalEEMod results). The generation of electricity through combustion of fossil fuels typically yields CO_2, and to a smaller extent, N_2O and CH_4. Natural gas emissions can be calculated using default values from the CEC sponsored CEUS and RASS studies which are built into CalEEMod. As shown in Table 6-2, the overall net increase in energy use at the project site would result in approximately 1,191 metric tons of CO_2E per year.

Water Use Emissions. The CalEEMod results indicate that the project would use approximately

33.9 million gallons of water per year. Based on the amount of electricity generated to supply and convey this amount of water, as shown in Table 6-3, the project would generate approximately 270 metric tons of CO_2E per year.

Solid Waste Emissions. For solid waste generated onsite, AB 341 mandates that municipal recycling programs be implemented to reduce the volume of solid waste disposed in landfills by 75%. The CalEEMod results indicate that without recycling, the project would result in approximately 74 metric tons of CO_2E per year associated with solid waste disposed within landfills.

Transportation Emissions. Mobile source GHG emissions were estimated using the default vehicle trip rate adjusted per the Traffic Impact Analysis. As shown in Table 6-4, the estimated mobile emissions of GHGs for the project based on the estimated annual VMT of 3,870,975 would be 2,335 MT CO_2E.

Combined Construction, Stationary and Mobile Source Emissions

Table 6-5 combines the net new construction, operational, and mobile GHG emissions associated with the proposed project. As discussed above, temporary emissions associated with construction activity (approximately 1,371 metric tons CO_2E) are amortized over 30 years (the anticipated life of the project).

Table 6-2
Estimated Annual Energy-Related Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Proposed Project	
Electricity	924 metric tons
Natural Gas	267 metric tons
Total	**1,191 metric tons**

See Appendix for CalEEMod software program output (demolition and new construction).

Table 6-3
Estimated Annual
Solid Waste and Water Use Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Water	270 metric tons
Solid Waste	74 metric tons
Total Water and Solid Waste	**344 metric tons**

See Appendix for CalEEMod software program output (demolition and new construction)..

Table 6-4
Estimated Annual Mobile Emissions of Greenhouse Gases

Emission Source	Annual Emissions (CO_2E)
Proposed Project	
Mobile Emissions (CO_2 & CH_4)	2,335 metric tons
Total	**2,335 metric tons**

See Appendix for CalEEMod software program output.

For the proposed project, the combined unmitigated annual emissions would total approximately 3,916 metric tons per year in CO_2E. The majority (60%) of the project's GHG emissions are associated with vehicle trips. The proposed project is evaluated based on whether measures to reduce GHG emissions would achieve at least a 21.7 percent reduction from baseline.

Table 6-5
Combined Annual Greenhouse Gas Emissions (BAU)

Emission Source	Annual Emissions (CO_2E)
Construction	46 metric tons
Operational	
Energy	1,191 metric tons
Solid Waste	74 metric tons
Water	270 metric tons
Mobile	2,335 metric tons
Total	**3,916 metric tons**

See Appendix for CalEEMod software program output (demolition and new construction).

GHG Cumulative Significance

To determine significance, the analysis first quantified project-related GHG emissions under a BAU scenario. These emissions are then compared to emissions that would occur when considering design features and compliance with applicable regulatory measures. The following regulations are incorporated into the CalEEMod emission factors used herein:

- Pavley I and Pavley II (LEV III) motor vehicle emission standards;
- ARB Medium and Heavy-Duty Vehicle Regulation; and
- 2005, 2008, 2013, and 2016 Title 24 Energy Efficiency Standards.

The following regulations have not been incorporated into the CalEEMod emission factors and require alternative methods to account for emission reductions provided by the regulations:

- Renewable Portfolio Standards (RPS);
- Low Carbon Fuel Standard (LCFS);
- Green Building Code Standards (indoor water use);
- California Model Water Efficient Landscape Ordinance (Outdoor Water);

As stated, Pavley II/LEV III standards have been incorporated in the latest version of CalEEMod. ARB estimated a 3 percent reduction by 2020 and a 19 percent reduction from the vehicle categories subject to the regulation by 2030 (ARB 2010b and ARB 2013a).

The ARB GHG Regulation for Medium and Heavy-Duty Engines and Vehicles applies to trucks that will operate in California and on the project site. The benefits of the regulation were incorporated into CalEEMod 2016.3.2. The ARB estimates that this regulation will reduce GHG emissions from the affected vehicles by 7.2 percent.

The Low Carbon Fuel Standard (LCFS) is estimated to have achieved a 10 percent reduction in emissions by 2020 and an 18 percent reduction by 2030 (ARB 2010a). CalEEMod does not include credit for the LCFS.

Title 24 reductions for 2013 and 2016 updates were added to CalEEMod 2016.3.2. The California Energy Commission (CEC) estimates that 2019 Title 24 standards would result in an increase in energy efficiency of 50 percent for residential buildings relative to the 2016 standards (Berkeley Law Fact Sheet).

RPS is not accounted for in CalEEMod 2016.3.2. Imperial Irrigation District (IID) assumes 33 percent of the electricity purchased by 2020 would be from renewable sources. Renewable targets are provided through 2030; however, to conservatively estimated the reduction on BAU emissions, 33 percent is used herein.

Energy savings from water conservation resulting from the Green Building Code Standards for indoor water use and California Model Water Efficient Landscape Ordinance for outdoor water use are not included in CalEEMod. The Water Conservation Act of 2009 mandates a 20 percent reduction in urban water use that is implemented with these regulations (CDWR 2013). Benefits of the water conservation regulations are applied in the CalEEMod mitigation component and assumes a total reduction in water demand associated with the project of 20 percent.

Reductions in emissions from solid waste are based on achieving the CalRecycle 75 Percent Initiative by 2020 compared with a 50 percent baseline for 2005. For modeling purposes, it was assumed that a 75 percent reduction of GHG emissions associated with solid waste disposal would be achieved with project operation.

Regulations applicable to project sources and the percent reduction anticipated from each source are shown in Table 6-6. The percentage reductions are only applied to the specific sources subject to the regulations. The results of this analysis are shown in Table 6-7.

Table 6-6
Reductions from Greenhouse Gas Regulations

Regulation	Project Applicability	Reduction Source	Percent Reduction in 2020 and 2030
Pavley Low Emission Vehicle Standards	Light-duty cars and trucks accessing the site are subject to the regulation.	CalEEMod defaults (Pavley I)	25.1[1]
		Adjusted GHG emission factor (Pavley II/LEV III) in CalEEMod.	3% 2020 19.5% 2030[2]
Truck and Bus Regulation	Heavy-duty trucks accessing the site for deliveries and services are subject to the regulation.	Adjusted GHG emission factors for the regulation in CalEEMod	7.2%[3]
Low Carbon Fuel Standard (LCFS)	Vehicles accessing the site will use fuel subject to the LCFS	CalEEMod defaults	10% 2020 18% 2030[1]
Title 24 Energy EfficiencyStandards	Project buildings will be constructed to meet the latest version of Title 24 (currently 2019). Reduction applies only to energy consumption subject to the regulation.	CalEEMod defaults	30%[4]
Green Building Code Standards	The project will include water conservation features required by the standard	CalEEMod mitigation component	20%[5]
Water Efficient Land Use Ordinance	The project landscaping will comply with the regulation	CalEEMod mitigation component	20%[5]
Renewable Portfolio Standard (RPS)	Electricity purchased for use at the project site is subject to the 33 percent RPS mandate	CalEEMod adjusted energy intensity factors with IID emission factors that show the company will exceed the 33 percent mandate.	33%[6]
Solid waste	The solid waste service provider will need to provide programs to increase diversion and recycling to meet the 75 percent mandate.	CalEEMod mitigation component	No adjustment for commercial buildings

Regulation	Project Applicability	Reduction Source	Percent Reduction in 2020 and 2030
Notes: Regulations are described in Section 2.3 Regulatory Environment. The source of the percentage reductions from each measure are from the following sources: 1 Pavley 1 + Low Carbon Fuel Standard Postprocessor Version 1.0 User's Guide (ARB 2010b) 2 ARB Staff Report for LEV III Amendments (ARB 2013b) 3 ARB Staff Report for GHG Regulations for Medium and Heavy-Duty Engines and Vehicles (ARB 2013c) 4 Berkeley Law Fact Sheet: Building Energy Efficiency; Title 24 Standards Will Cut Residential Energy Use in residential buildings by 50 Percent, 5 SB X7-7/CAPCOA Water Conservation Strategy applied as mitigation in CalEEMod 2016.3.2			

Table 6-7
Combined Annual Greenhouse Gas Mitigated Emissions

Emission Source	Annual Emissions (CO_2E)	2023 With Design Features	Percent Reduction
Construction	46 metric tons	46	0.0%
Operational			
Energy	1,191 metric tons	202	83%
Solid Waste	74 metric tons	18	75%
Water	270 metric tons	193	20%
Mobile	2,335 metric tons	1,915	18%
Total	**3,916 metric tons**	**2,374 metric tons**	**-39%**

See Appendix for CalEEMod software program output.

As referenced, specific goals and actions that pertain to the proposed project include those addressing energy and water use reduction, promotion of green building measures, waste reduction, and reduction in vehicle miles traveled. The proposed project would also be required to implement all mandatory green building measures for new residential development under the CALGreen Code. As shown, GHG emission reductions associated with energy and fuel programs mandated at the state level would reduce BAU emissions by 39%. This would exceed the 21.7% target referenced herein; thus, resulting in a less than significant GHG impact under threshold a.

6.6 CONSISTENCY WITH AB 32 SCOPING PLANS AND SB 32

AB 32 Scoping Plan. 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. As stated earlier, the ARB has updated its emission inventory forecasts and now estimates a reduction of 21.7 percent is required from BAU in 2020 to achieve AB 32 targets. The 2017 Scoping Plan Update strategies primarily rely on increasing the stringency of existing regulations to achieve 2030 emission reduction goals.

Table 6-8 summarizes strategies intended to reduce statewide GHG emissions and project consistency with those that are applicable based on the project scope.

Table 6-8
Project Consistency with AB 32 Scoping Plan

Scoping Plan Sector	Scoping Plan Measure	Implementation Regulation	Project Consistency
Transportation	California Cap-and-Trade Program Linked to Western Climate Initiative	Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanism October20, 2015 (CCR 95800)	**Consistent.** The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers. The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are indirectly covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels.
	California Light-Duty Vehicle Greenhouse Gas Standards	Pavley I 2005 Regulations to Control GHG Emissions from Motor Vehicles 2012 LEV III Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards	**Consistent**. This measure applies to all new vehicles starting with model year 2012. The project would not conflict with its implementation as it would apply to all new passenger vehicles purchased in California. Passenger vehicles, model year 2012 and later, associated with construction and operation of the project would be required to comply with the Pavley emissions standards.
	Low Carbon Fuel Standard	2009 readopted in 2015. Regulations to Achieve	**Consistent.** This measure applies to transportation fuels used in vehicles

Scoping Plan Sector	Scoping Plan Measure	Implementation Regulation	Project Consistency
		Greenhouse Gas Emission Reductions Subarticle 7. Low Carbon Fuel Standard CCR 95480	operating in California. The project would not conflict with implementation of this measure. Motor vehicles associated with construction and operation of the project would utilize low carbon transportation fuels as required under this measure.
	Regional Transportation-Related Greenhouse Gas Targets.	SB 375. Cal. Public Resources Code §§ 21155, 21155.1, 21155.2, 21159.28	**Consistent**. The project will provide commercial development in the region that is consistent with the land uses assessed in the 2018 Regional Transportation Plan/Sustainable Communities Strategy (SCS). The project is not within an SCS priority area; and thus, is not subject to requirements applicable to those areas.
	Goods Movement	Goods Movement Action Plan January 2007.	**Not applicable**. The project does not propose any changes to maritime, rail, or intermodal facilities or forms of transportation.
	Medium/Heavy-Duty Vehicles	2010 Amendments to the Truck and Bus Regulation, the Drayage Truck Regulation and the Tractor-Trailer Greenhouse Gas Regulation	**Consistent**. This measure applies to medium- and heavy-duty vehicles that operate in the State. The project would not conflict with implementation of this measure. Medium and heavy-duty vehicles associated with construction and operation of the project would be required to comply with the requirements of this regulation.
	High Speed Rail	Funded under SB 862	**Not applicable**. The project is not related to high-speed rail.
Electricity and Natural Gas	Energy Efficiency	Title 20 Appliance Efficiency Regulation	**Consistent.** The project will comply with the latest energy efficiency standards and incorporate applicable energy efficiency features designed to reduce project energy consumption.
		Title 24 Part 6 Energy Efficiency Standards for Residential and Non-Residential Building	
		Title 24 Part 11 California Green Building Code Standards	

Scoping Plan Sector	Scoping Plan Measure	Implementation Regulation	Project Consistency
	Renewable Portfolio Standard/Renewable Electricity Standard.	2010 Regulation to Implement the Renewable Electricity Standard (33% 2020)	**Consistent.** PG&E obtained 33 percent of its power supply from renewable sources such as solar and geothermal in 2017, and about 70 percent of the electricity it delivers is carbon-free, including nuclear and large hydroelectric facilities. The owner of the project would purchase power that is comprised of renewable energy meeting the RPS standard.
		SB 350 Clean Energy and Pollution Reduction Act of 2015 (50% 2030)	
	Million Solar Roofs Program	Tax incentive program	**Consistent.** This measure is intended to increase solar throughout California by means of a variety of electricity providers and existing solar programs. Project design does not preclude the future installation of solar panels.
Water	Water	Title 24 Part 11 California Green Building Code Standards	**Consistent.** The project will comply with the California Green Building Standards Code, which requires a 20 percent reduction in indoor water use. The project will also comply with the MWELO as required by the City's development code and water ordinance.
		SBX 7-7—The Water Conservation Act of 2009	
		Model Water Efficient Landscape Ordinance	
Green Building	Green Building Strategy	Title 24 Part 11 California Green Building Code Standards	**Consistent.** The State will increase the use of green building practices. The project would implement required green building strategies per 2019 Title 24 standards and related CALGreen requirements.
Recycling and Waste Management	Recycling and Waste	Title 24 Part 11 California Green Building Code Standards	**Consistent.** The project would not conflict with implementation of these measures. However, compliance was not a factor in determining project consistency with overall GHG emission reduction goals.
		AB 341 Statewide 75 Percent Diversion Goal	
Source of ARB Scoping Plan Reduction Measures: California Air Resources Board 2008.			

SB 32. This bill establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40% below 1990 levels by December 31, 2030.

The reduction measures implemented by the project and/or required by regulatory controls addressing fuel and electrical energy conservation would reduce overall GHG emissions by more than 21.7 percent. Thus, the project is not considered a cumulatively considerable source of GHG emissions. CARB has indicated that statewide, California is on track to achieving both the 2030 and 2050 goals. CARB stated in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32. This is confirmed in the 2017 Scoping Plan, which states that the Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets. Project consistency with the 2017 Scoping Plan measures are summarized in Table 6-9.

Table 6-8
Consistency with SB 32 2017 Scoping Plan Update

Scoping Plan Measure	Project Consistency
SB 350 50% Renewable Mandate. Utilities subject to the legislation will be required to increase their renewable energy mix from 33% in 2020 to 50% in 2030.	**Consistent**: The project will purchase electricity froma utility subject to the SB 350 Renewable Mandate.
SB 350 Double Building Energy Efficiency by 2030. This is equivalent to a 20 percent reduction from 2014 building energy usage compared to current projected 2030 levels	**Not Applicable**. This measure applies to existing buildings. New structures are required to comply with Title 24 Energy Efficiency Standards that are expected to increase in stringency until nonresidential buildings achieve zero net energy.
Low Carbon Fuel Standard. This measure requires fuel providers to meet an 18 percent reduction in carbon content by 2030.	**Consistent**. Vehicles accessing the project site will use fuel containing lower carbon content as the fuel standard is implemented.
Mobile Source Strategy (Cleaner Technology and Fuels Scenario) Vehicle manufacturers will be required to meet existing regulations mandated by the LEV III and Heavy-Duty Vehicle programs. The strategy includes a goal of having 4.2 million ZEVs on the road by 2030 and increasing numbers of ZEV trucks and buses.	**Consistent**. Project customers and employees may purchase increasing numbers of more fuel efficient and zero emission cars and trucks each year. The 2016 CALGreen Code requires electrical service in commercial projects to be EV charger ready.
Sustainable Freight Action Plan The plan's target is to improve freight system efficiency 25 percent by increasing the value of goods and services produced from the freight sector, relative to the amount of carbon that it produces by 2030. This would be achieved by deploying over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	**Not Applicable**. The measure applies to owners and operators of trucks and freight operations. However, trucks accessing the project site are expected to be made by increasing number of ZEV delivery trucks.
Short-Lived Climate Pollutant (SLCP) Reduction Strategy. The strategy requires the reduction of SLCPs	**Consistent**. The project will be accessed by vehicles meeting increasingly stringent particulate matter

Scoping Plan Measure	Project Consistency
by 40 percent from 2013 levels by 2030 and the reduction of black carbon by 50 percent from 2013 levels by 2030.	standards that reduce black carbon compared to older trucks.
SB 375 Sustainable Communities Strategies. Requires Regional Transportation Plans to include a sustainable communities strategy for reduction of per capita vehicle miles traveled.	**Consistent**. The project will provide commercial development in the region that is consistent with the Regional Transportation Plan/Sustainable Communities Strategy (SCS) assumptions. The project is not within an SCS priority area and so is not subject to requirements applicable to those areas.
Post-2020 Cap-and-Trade Program. The Post 2020Cap-and-Trade Program continues the existing program for another 10 years. The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers.	**Consistent.** The post-2020 Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Thus, GHG emissions associated with new development is covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the program's first compliance period.
Natural and Working Lands Action Plan. The ARB isworking in coordination with several other agencies at the federal, state, and local levels, stakeholders, and with the public, to develop measures as outlined in the Scoping Plan Update and the governor's Executive Order B-30-15 to reduce GHG emissions and to cultivate net carbon sequestration potential for California's natural and working land.	**Not Applicable**. The project is commercial development.
Source: ARB 2017 Scoping Plan Update (ARB 2017c).	

As stated, the project would not generate enough GHG emissions to cumulatively contribute to global climate change; and thus, would not adversely impact the attainment of statewide reductions in GHG emissions referenced above. The project would be consistent with EO S-3-05, AB 32 as well as the GHG reduction goals established by SB 32. Impacts would be less than significant under threshold b.

CHAPTER 7.0
REFERENCES

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APPENDIX A

CalEEMod Modeling Data

Heber Meadows Miraluz

Imperial County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	1.00	Acre	1.00	43,560.00	0
Parking Lot	320.00	Space	2.88	128,000.00	0
Apartments Low Rise	320.00	Dwelling Unit	20.00	320,000.00	1034

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assumes one acre of distrubance daily for construction of the SR-86/Pitzer Road improvements.

Construction Phase - Architectural coating phase overlapped with building construction.

On-road Fugitive Dust - All road surrounding the project site are paved; thus, 100% assumed for worker, vendor and hauling.

Road Dust - All roads surrounding the site are paved.

Woodstoves - Assumes 5% of units would have gas fireplaces.

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Waste Mitigation -

Vehicle Trips - Trip rate and VMT adjusted to reflect TIA/VMT analysis

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	40
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	PhaseEndDate	1/26/2024	12/1/2023
tblConstructionPhase	PhaseStartDate	12/30/2023	9/1/2023
tblFireplaces	NumberGas	176.00	16.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	100
tblVehicleTrips	HO_TL	8.10	6.88
tblVehicleTrips	HS_TL	11.70	6.88
tblVehicleTrips	HW_TL	10.20	6.88
tblVehicleTrips	ST_TR	7.16	5.44
tblVehicleTrips	SU_TR	6.07	5.44
tblVehicleTrips	WD_TR	6.59	5.44

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.1853	38.9396	34.9308	0.0739	2,811.3467	1.6358	2,812.1874	280.8693	1.5050	281.6603	0.0000	7,335.8179	7,335.8179	1.9550	0.0000	7,357.7113
2023	66.2264	22.0062	38.1228	0.0797	3,261.9435	0.7937	3,262.7372	325.8807	0.7508	326.6315	0.0000	7,901.5644	7,901.5644	0.8783	0.0000	7,923.5212
Maximum	**66.2264**	**38.9396**	**38.1228**	**0.0797**	**3,261.9435**	**1.6358**	**3,262.7372**	**325.8807**	**1.5050**	**326.6315**	**0.0000**	**7,901.5644**	**7,901.5644**	**1.9550**	**0.0000**	**7,923.5212**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.1853	38.9396	34.9308	0.0739	2,811.3467	1.6358	2,812.1874	280.8693	1.5050	281.6603	0.0000	7,335.8179	7,335.8179	1.9550	0.0000	7,357.7113
2023	66.2264	22.0062	38.1228	0.0797	3,261.9435	0.7937	3,262.7372	325.8807	0.7508	326.6315	0.0000	7,901.5644	7,901.5644	0.8783	0.0000	7,923.5212
Maximum	**66.2264**	**38.9396**	**38.1228**	**0.0797**	**3,261.9435**	**1.6358**	**3,262.7372**	**325.8807**	**1.5050**	**326.6315**	**0.0000**	**7,901.5644**	**7,901.5644**	**1.9550**	**0.0000**	**7,923.5212**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.8530	0.5515	26.5441	2.9700e-003		0.1662	0.1662		0.1662	0.1662	0.0000	362.7129	362.7129	0.0519	5.7800e-003	365.7328
Energy	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408
Mobile	5.2655	28.8014	56.4511	0.1464	8.3255	0.0655	8.3911	2.2326	0.0613	2.2939		14,945.3053	14,945.3053	0.9687		14,969.5215
Total	**14.2657**	**30.6113**	**83.5307**	**0.1574**	**8.3255**	**0.3335**	**8.6590**	**2.2326**	**0.3293**	**2.5619**	**0.0000**	**16,914.4130**	**16,914.4130**	**1.0514**	**0.0352**	**16,951.1951**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.8530	0.5515	26.5441	2.9700e-003		0.1662	0.1662		0.1662	0.1662	0.0000	362.7129	362.7129	0.0519	5.7800e-003	365.7328
Energy	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408
Mobile	5.1940	28.4399	54.3954	0.1410	7.9092	0.0628	7.9720	2.1210	0.0588	2.1797		14,394.0251	14,394.0251	0.9445		14,417.6382
Total	**14.1942**	**30.2497**	**81.4749**	**0.1520**	**7.9092**	**0.3308**	**8.2400**	**2.1210**	**0.3267**	**2.4477**	**0.0000**	**16,363.1328**	**16,363.1328**	**1.0273**	**0.0352**	**16,399.3118**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.50	1.18	2.46	3.46	5.00	0.82	4.84	5.00	0.78	4.46	0.00	3.26	3.26	2.29	0.00	3.26

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/4/2022	4/29/2022	5	20	
2	Site Preparation	Site Preparation	4/30/2022	5/13/2022	5	10	
3	Grading	Grading	5/14/2022	7/1/2022	5	35	
4	Building Construction	Building Construction	7/2/2022	12/1/2023	5	370	
5	Paving	Paving	12/2/2023	12/29/2023	5	20	
6	Architectural Coating	Architectural Coating	9/1/2023	12/1/2023	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 3.88

Residential Indoor: 648,000; Residential Outdoor: 216,000; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 10,294 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	302.00	62.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	60.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**		**1.2427**	**1.2427**		**1.1553**	**1.1553**		**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.0721	0.8359	1.1000e-003	112.6492	6.9000e-004	112.6499	11.2529	6.4000e-004	11.2535		109.1280	109.1280	8.1000e-003		109.3306
Total	**0.1103**	**0.0721**	**0.8359**	**1.1000e-003**	**112.6492**	**6.9000e-004**	**112.6499**	**11.2529**	**6.4000e-004**	**11.2535**		**109.1280**	**109.1280**	**8.1000e-003**		**109.3306**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**		**1.2427**	**1.2427**		**1.1553**	**1.1553**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1103	0.0721	0.8359	1.1000e-003	112.6492	6.9000e-004	112.6499	11.2529	6.4000e-004	11.2535		109.1280	109.1280	8.1000e-003		109.3306
Total	**0.1103**	**0.0721**	**0.8359**	**1.1000e-003**	**112.6492**	**6.9000e-004**	**112.6499**	**11.2529**	**6.4000e-004**	**11.2535**		**109.1280**	**109.1280**	**8.1000e-003**		**109.3306**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1323	0.0865	1.0031	1.3200e-003	135.1791	8.3000e-004	135.1799	13.5034	7.6000e-004	13.5042		130.9536	130.9536	9.7300e-003		131.1967
Total	**0.1323**	**0.0865**	**1.0031**	**1.3200e-003**	**135.1791**	**8.3000e-004**	**135.1799**	**13.5034**	**7.6000e-004**	**13.5042**		**130.9536**	**130.9536**	**9.7300e-003**		**131.1967**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**8.1298**	**1.6126**	**9.7424**	**4.4688**	**1.4836**	**5.9524**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1323	0.0865	1.0031	1.3200e-003	135.1791	8.3000e-004	135.1799	13.5034	7.6000e-004	13.5042		130.9536	130.9536	9.7300e-003		131.1967
Total	**0.1323**	**0.0865**	**1.0031**	**1.3200e-003**	**135.1791**	**8.3000e-004**	**135.1799**	**13.5034**	**7.6000e-004**	**13.5042**		**130.9536**	**130.9536**	**9.7300e-003**		**131.1967**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**8.6733**	**1.6349**	**10.3082**	**3.5965**	**1.5041**	**5.1006**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1470	0.0962	1.1146	1.4700e-003	150.1990	9.2000e-004	150.1999	15.0038	8.5000e-004	15.0047		145.5040	145.5040	0.0108		145.7741
Total	**0.1470**	**0.0962**	**1.1146**	**1.4700e-003**	**150.1990**	**9.2000e-004**	**150.1999**	**15.0038**	**8.5000e-004**	**15.0047**		**145.5040**	**145.5040**	**0.0108**		**145.7741**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**3.9030**	**1.6349**	**5.5379**	**1.6184**	**1.5041**	**3.1225**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1470	0.0962	1.1146	1.4700e-003	150.1990	9.2000e-004	150.1999	15.0038	8.5000e-004	15.0047		145.5040	145.5040	0.0108		145.7741
Total	**0.1470**	**0.0962**	**1.1146**	**1.4700e-003**	**150.1990**	**9.2000e-004**	**150.1999**	**15.0038**	**8.5000e-004**	**15.0047**		**145.5040**	**145.5040**	**0.0108**		**145.7741**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2588	6.5241	1.7376	0.0247	543.3425	0.0178	543.3603	54.3118	0.0170	54.3289		2,584.3743	2,584.3743	0.1006		2,586.8897
Worker	2.2203	1.4520	16.8299	0.0222	2,268.0042	0.0139	2,268.0181	226.5575	0.0128	226.5703		2,197.1100	2,197.1100	0.1632		2,201.1893
Total	**2.4791**	**7.9760**	**18.5674**	**0.0469**	**2,811.3467**	**0.0317**	**2,811.3784**	**280.8693**	**0.0299**	**280.8991**		**4,781.4843**	**4,781.4843**	**0.2638**		**4,788.0790**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2588	6.5241	1.7376	0.0247	543.3425	0.0178	543.3603	54.3118	0.0170	54.3289		2,584.3743	2,584.3743	0.1006		2,586.8897
Worker	2.2203	1.4520	16.8299	0.0222	2,268.0042	0.0139	2,268.0181	226.5575	0.0128	226.5703		2,197.1100	2,197.1100	0.1632		2,201.1893
Total	**2.4791**	**7.9760**	**18.5674**	**0.0469**	**2,811.3467**	**0.0317**	**2,811.3784**	**280.8693**	**0.0299**	**280.8991**		**4,781.4843**	**4,781.4843**	**0.2638**		**4,788.0790**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2099	4.7135	1.5174	0.0242	543.3425	7.1300e-003	543.3497	54.3118	6.8200e-003	54.3186		2,531.2208	2,531.2208	0.0744		2,533.0812
Worker	2.0784	1.3388	15.4757	0.0214	2,268.0042	0.0134	2,268.0175	226.5575	0.0123	226.5698		2,113.7377	2,113.7377	0.1495		2,117.4746
Total	**2.2883**	**6.0523**	**16.9930**	**0.0456**	**2,811.3467**	**0.0205**	**2,811.3672**	**280.8693**	**0.0191**	**280.8884**		**4,644.9585**	**4,644.9585**	**0.2239**		**4,650.5558**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2099	4.7135	1.5174	0.0242	543.3425	7.1300e-003	543.3497	54.3118	6.8200e-003	54.3186		2,531.2208	2,531.2208	0.0744		2,533.0812
Worker	2.0784	1.3388	15.4757	0.0214	2,268.0042	0.0134	2,268.0175	226.5575	0.0123	226.5698		2,113.7377	2,113.7377	0.1495		2,117.4746
Total	**2.2883**	**6.0523**	**16.9930**	**0.0456**	**2,811.3467**	**0.0205**	**2,811.3672**	**280.8693**	**0.0191**	**280.8884**		**4,644.9585**	**4,644.9585**	**0.2239**		**4,650.5558**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.5083					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5410**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1032	0.0665	0.7687	1.0600e-003	112.6492	6.6000e-004	112.6499	11.2529	6.1000e-004	11.2535		104.9870	104.9870	7.4200e-003		105.1726
Total	**0.1032**	**0.0665**	**0.7687**	**1.0600e-003**	**112.6492**	**6.6000e-004**	**112.6499**	**11.2529**	**6.1000e-004**	**11.2535**		**104.9870**	**104.9870**	**7.4200e-003**		**105.1726**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.5083					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.5410**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1032	0.0665	0.7687	1.0600e-003	112.6492	6.6000e-004	112.6499	11.2529	6.1000e-004	11.2535		104.9870	104.9870	7.4200e-003		105.1726
Total	**0.1032**	**0.0665**	**0.7687**	**1.0600e-003**	**112.6492**	**6.6000e-004**	**112.6499**	**11.2529**	**6.1000e-004**	**11.2535**		**104.9870**	**104.9870**	**7.4200e-003**		**105.1726**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	61.7607					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**61.9524**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.4129	0.2660	3.0746	4.2400e-003	450.5969	2.6500e-003	450.5995	45.0114	2.4400e-003	45.0139		419.9479	419.9479	0.0297		420.6903
Total	**0.4129**	**0.2660**	**3.0746**	**4.2400e-003**	**450.5969**	**2.6500e-003**	**450.5995**	**45.0114**	**2.4400e-003**	**45.0139**		**419.9479**	**419.9479**	**0.0297**		**420.6903**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	61.7607					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**61.9524**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.4129	0.2660	3.0746	4.2400e-003	450.5969	2.6500e-003	450.5995	45.0114	2.4400e-003	45.0139		419.9479	419.9479	0.0297		420.6903
Total	**0.4129**	**0.2660**	**3.0746**	**4.2400e-003**	**450.5969**	**2.6500e-003**	**450.5995**	**45.0114**	**2.4400e-003**	**45.0139**		**419.9479**	**419.9479**	**0.0297**		**420.6903**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Integrate Below Market Rate Housing

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.1940	28.4399	54.3954	0.1410	7.9092	0.0628	7.9720	2.1210	0.0588	2.1797		14,394.0251	14,394.0251	0.9445		14,417.6382
Unmitigated	5.2655	28.8014	56.4511	0.1464	8.3255	0.0655	8.3911	2.2326	0.0613	2.2939		14,945.3053	14,945.3053	0.9687		14,969.5215

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,740.80	1,740.80	1740.80	3,870,975	3,677,426
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	1,740.80	1,740.80	1,740.80	3,870,975	3,677,426

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	6.88	6.88	6.88	40.20	19.20	40.60	86	11	3
Other Asphalt Surfaces	16.40	9.50	11.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.40	9.50	11.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Other Asphalt Surfaces	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Parking Lot	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408
NaturalGas Unmitigated	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	13654.4	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1473**	**1.2583**	**0.5355**	**8.0300e-003**		**0.1017**	**0.1017**		**0.1017**	**0.1017**		**1,606.3948**	**1,606.3948**	**0.0308**	**0.0295**	**1,615.9408**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	13.6544	0.1473	1.2583	0.5355	8.0300e-003		0.1017	0.1017		0.1017	0.1017		1,606.3948	1,606.3948	0.0308	0.0295	1,615.9408
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.1473**	**1.2583**	**0.5355**	**8.0300e-003**		**0.1017**	**0.1017**		**0.1017**	**0.1017**		**1,606.3948**	**1,606.3948**	**0.0308**	**0.0295**	**1,615.9408**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	8.8530	0.5515	26.5441	2.9700e-003		0.1662	0.1662		0.1662	0.1662	0.0000	362.7129	362.7129	0.0519	5.7800e-003	365.7328
Unmitigated	8.8530	0.5515	26.5441	2.9700e-003		0.1662	0.1662		0.1662	0.1662	0.0000	362.7129	362.7129	0.0519	5.7800e-003	365.7328

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1168					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.9088					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0289	0.2468	0.1050	1.5800e-003		0.0200	0.0200		0.0200	0.0200	0.0000	315.1059	315.1059	6.0400e-003	5.7800e-003	316.9784
Landscaping	0.7986	0.3047	26.4391	1.4000e-003		0.1463	0.1463		0.1463	0.1463		47.6070	47.6070	0.0459		48.7544
Total	**8.8530**	**0.5515**	**26.5441**	**2.9800e-003**		**0.1662**	**0.1662**		**0.1662**	**0.1662**	**0.0000**	**362.7129**	**362.7129**	**0.0519**	**5.7800e-003**	**365.7328**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1168					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.9088					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0289	0.2468	0.1050	1.5800e-003		0.0200	0.0200		0.0200	0.0200	0.0000	315.1059	315.1059	6.0400e-003	5.7800e-003	316.9784
Landscaping	0.7986	0.3047	26.4391	1.4000e-003		0.1463	0.1463		0.1463	0.1463		47.6070	47.6070	0.0459		48.7544
Total	**8.8530**	**0.5515**	**26.5441**	**2.9800e-003**		**0.1662**	**0.1662**		**0.1662**	**0.1662**	**0.0000**	**362.7129**	**362.7129**	**0.0519**	**5.7800e-003**	**365.7328**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Heber Meadows Miraluz

Imperial County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	1.00	Acre	1.00	43,560.00	0
Parking Lot	320.00	Space	2.88	128,000.00	0
Apartments Low Rise	320.00	Dwelling Unit	20.00	320,000.00	1034

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assumes one acre of distrubance daily for construction of the SR-86/Pitzer Road improvements.

Construction Phase - Architectural coating phase overlapped with building construction.

On-road Fugitive Dust - All road surrounding the project site are paved; thus, 100% assumed for worker, vendor and hauling.

Road Dust - All roads surrounding the site are paved.

Woodstoves - Assumes 5% of units would have gas fireplaces.

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Waste Mitigation -

Vehicle Trips - Trip rate and VMT adjusted to reflect TIA/VMT analysis

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	40
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	PhaseEndDate	1/26/2024	12/1/2023
tblConstructionPhase	PhaseStartDate	12/30/2023	9/1/2023
tblFireplaces	NumberGas	176.00	16.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	100
tblVehicleTrips	HO_TL	8.10	6.88
tblVehicleTrips	HS_TL	11.70	6.88
tblVehicleTrips	HW_TL	10.20	6.88
tblVehicleTrips	ST_TR	7.16	5.44
tblVehicleTrips	SU_TR	6.07	5.44
tblVehicleTrips	WD_TR	6.59	5.44

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3604	2.6532	2.9032	6.3500e-003	181.2602	0.1038	181.3640	18.1979	0.0968	18.2946	0.0000	567.9695	567.9695	0.0967	0.0000	570.3871
2023	2.4998	2.6206	3.9299	8.8800e-003	341.7465	0.0940	341.8405	34.1434	0.0884	34.2318	0.0000	799.1320	799.1320	0.0966	0.0000	801.5471
Maximum	**2.4998**	**2.6532**	**3.9299**	**8.8800e-003**	**341.7465**	**0.1038**	**341.8405**	**34.1434**	**0.0968**	**34.2318**	**0.0000**	**799.1320**	**799.1320**	**0.0967**	**0.0000**	**801.5471**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3604	2.6532	2.9032	6.3500e-003	181.1270	0.1038	181.2308	18.1360	0.0968	18.2327	0.0000	567.9692	567.9692	0.0967	0.0000	570.3868
2023	2.4998	2.6206	3.9299	8.8800e-003	341.7465	0.0940	341.8405	34.1434	0.0884	34.2318	0.0000	799.1316	799.1316	0.0966	0.0000	801.5468
Maximum	**2.4998**	**2.6532**	**3.9299**	**8.8800e-003**	**341.7465**	**0.1038**	**341.8405**	**34.1434**	**0.0968**	**34.2318**	**0.0000**	**799.1316**	**799.1316**	**0.0967**	**0.0000**	**801.5468**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.03**	**0.00**	**0.03**	**0.12**	**0.00**	**0.12**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-4-2022	7-3-2022	1.2147	1.2147
2	7-4-2022	10-3-2022	0.9125	0.9125
3	10-4-2022	1-3-2023	0.9038	0.9038
4	1-4-2023	4-3-2023	0.7739	0.7739
5	4-4-2023	7-3-2023	0.7897	0.7897
6	7-4-2023	9-30-2023	1.4573	1.4573
		Highest	1.4573	1.4573

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.5366	0.0280	2.3797	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	4.5016	4.5016	3.7600e-003	1.0000e-005	4.5989
Energy	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	1,188.3575	1,188.3575	0.0262	9.2300e-003	1,191.7619
Mobile	0.7924	5.2679	8.6834	0.0251	1.5047	0.0120	1.5167	0.4038	0.0112	0.4150	0.0000	2,330.9978	2,330.9978	0.1542	0.0000	2,334.8526
Waste						0.0000	0.0000		0.0000	0.0000	29.8803	0.0000	29.8803	1.7659	0.0000	74.0271
Water						0.0000	0.0000		0.0000	0.0000	6.6145	240.6821	247.2966	0.6849	0.0172	269.5372
Total	**2.3559**	**5.5255**	**11.1609**	**0.0267**	**1.5047**	**0.0438**	**1.5485**	**0.4038**	**0.0430**	**0.4468**	**36.4948**	**3,764.5389**	**3,801.0337**	**2.6348**	**0.0264**	**3,874.7777**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.5366	0.0280	2.3797	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	4.5016	4.5016	3.7600e-003	1.0000e-005	4.5989
Energy	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	1,188.3575	1,188.3575	0.0262	9.2300e-003	1,191.7619
Mobile	0.7808	5.1972	8.3893	0.0242	1.4295	0.0115	1.4410	0.3836	0.0108	0.3943	0.0000	2,245.0595	2,245.0595	0.1507	0.0000	2,248.8277
Waste						0.0000	0.0000		0.0000	0.0000	7.4701	0.0000	7.4701	0.4415	0.0000	18.5068
Water						0.0000	0.0000		0.0000	0.0000	5.2916	192.5456	197.8373	0.5479	0.0137	215.6298
Total	**2.3443**	**5.4548**	**10.8667**	**0.0258**	**1.4295**	**0.0433**	**1.4728**	**0.3836**	**0.0426**	**0.4261**	**12.7617**	**3,630.4642**	**3,643.2259**	**1.1700**	**0.0230**	**3,679.3250**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.49	1.28	2.64	3.48	5.00	1.12	4.89	5.00	1.09	4.62	65.03	3.56	4.15	55.60	13.02	5.04

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/4/2022	4/29/2022	5	20	
2	Site Preparation	Site Preparation	4/30/2022	5/13/2022	5	10	
3	Grading	Grading	5/14/2022	7/1/2022	5	35	
4	Building Construction	Building Construction	7/2/2022	12/1/2023	5	370	
5	Paving	Paving	12/2/2023	12/29/2023	5	20	
6	Architectural Coating	Architectural Coating	9/1/2023	12/1/2023	5	66	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 3.88

Residential Indoor: 648,000; Residential Outdoor: 216,000; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 10,294 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	302.00	62.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	60.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0116**	**0.0116**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.5000e-004	6.7400e-003	1.0000e-005	1.0895	1.0000e-005	1.0895	0.1088	1.0000e-005	0.1088	0.0000	0.8952	0.8952	6.0000e-005	0.0000	0.8968
Total	**9.4000e-004**	**7.5000e-004**	**6.7400e-003**	**1.0000e-005**	**1.0895**	**1.0000e-005**	**1.0895**	**0.1088**	**1.0000e-005**	**0.1088**	**0.0000**	**0.8952**	**0.8952**	**6.0000e-005**	**0.0000**	**0.8968**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0116**	**0.0116**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	7.5000e-004	6.7400e-003	1.0000e-005	1.0895	1.0000e-005	1.0895	0.1088	1.0000e-005	0.1088	0.0000	0.8952	0.8952	6.0000e-005	0.0000	0.8968
Total	**9.4000e-004**	**7.5000e-004**	**6.7400e-003**	**1.0000e-005**	**1.0895**	**1.0000e-005**	**1.0895**	**0.1088**	**1.0000e-005**	**0.1088**	**0.0000**	**0.8952**	**0.8952**	**6.0000e-005**	**0.0000**	**0.8968**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0903**	**8.0600e-003**	**0.0984**	**0.0497**	**7.4200e-003**	**0.0571**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	4.5000e-004	4.0400e-003	1.0000e-005	0.6537	0.0000	0.6537	0.0653	0.0000	0.0653	0.0000	0.5371	0.5371	4.0000e-005	0.0000	0.5381
Total	**5.7000e-004**	**4.5000e-004**	**4.0400e-003**	**1.0000e-005**	**0.6537**	**0.0000**	**0.6537**	**0.0653**	**0.0000**	**0.0653**	**0.0000**	**0.5371**	**0.5371**	**4.0000e-005**	**0.0000**	**0.5381**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0159	0.1654	0.0985	1.9000e-004		8.0600e-003	8.0600e-003		7.4200e-003	7.4200e-003	0.0000	16.7197	16.7197	5.4100e-003	0.0000	16.8549
Total	**0.0159**	**0.1654**	**0.0985**	**1.9000e-004**	**0.0407**	**8.0600e-003**	**0.0487**	**0.0223**	**7.4200e-003**	**0.0298**	**0.0000**	**16.7197**	**16.7197**	**5.4100e-003**	**0.0000**	**16.8549**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.7000e-004	4.5000e-004	4.0400e-003	1.0000e-005	0.6537	0.0000	0.6537	0.0653	0.0000	0.0653	0.0000	0.5371	0.5371	4.0000e-005	0.0000	0.5381
Total	**5.7000e-004**	**4.5000e-004**	**4.0400e-003**	**1.0000e-005**	**0.6537**	**0.0000**	**0.6537**	**0.0653**	**0.0000**	**0.0653**	**0.0000**	**0.5371**	**0.5371**	**4.0000e-005**	**0.0000**	**0.5381**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6798	0.5082	1.0900e-003		0.0286	0.0286		0.0263	0.0263	0.0000	95.4356	95.4356	0.0309	0.0000	96.2072
Total	**0.0634**	**0.6798**	**0.5082**	**1.0900e-003**	**0.1518**	**0.0286**	**0.1804**	**0.0629**	**0.0263**	**0.0893**	**0.0000**	**95.4356**	**95.4356**	**0.0309**	**0.0000**	**96.2072**

3.4 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-003	1.7400e-003	0.0157	2.0000e-005	2.5421	2.0000e-005	2.5421	0.2540	1.0000e-005	0.2540	0.0000	2.0888	2.0888	1.5000e-004	0.0000	2.0926
Total	**2.2000e-003**	**1.7400e-003**	**0.0157**	**2.0000e-005**	**2.5421**	**2.0000e-005**	**2.5421**	**0.2540**	**1.0000e-005**	**0.2540**	**0.0000**	**2.0888**	**2.0888**	**1.5000e-004**	**0.0000**	**2.0926**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0683	0.0000	0.0683	0.0283	0.0000	0.0283	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6798	0.5082	1.0900e-003		0.0286	0.0286		0.0263	0.0263	0.0000	95.4354	95.4354	0.0309	0.0000	96.2071
Total	**0.0634**	**0.6798**	**0.5082**	**1.0900e-003**	**0.0683**	**0.0286**	**0.0969**	**0.0283**	**0.0263**	**0.0546**	**0.0000**	**95.4354**	**95.4354**	**0.0309**	**0.0000**	**96.2071**

3.4 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-003	1.7400e-003	0.0157	2.0000e-005	2.5421	2.0000e-005	2.5421	0.2540	1.0000e-005	0.2540	0.0000	2.0888	2.0888	1.5000e-004	0.0000	2.0926
Total	**2.2000e-003**	**1.7400e-003**	**0.0157**	**2.0000e-005**	**2.5421**	**2.0000e-005**	**2.5421**	**0.2540**	**1.0000e-005**	**0.2540**	**0.0000**	**2.0888**	**2.0888**	**1.5000e-004**	**0.0000**	**2.0926**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6214	150.6214	0.0361	0.0000	151.5235
Total	**0.1109**	**1.0150**	**1.0636**	**1.7500e-003**		**0.0526**	**0.0526**		**0.0495**	**0.0495**	**0.0000**	**150.6214**	**150.6214**	**0.0361**	**0.0000**	**151.5235**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0168	0.4352	0.1189	1.5900e-003	34.1570	1.1700e-003	34.1581	3.4145	1.1200e-003	3.4156	0.0000	150.5273	150.5273	6.2100e-003	0.0000	150.6826
Worker	0.1233	0.0976	0.8816	1.3000e-003	142.5759	9.0000e-004	142.5768	14.2428	8.3000e-004	14.2436	0.0000	117.1542	117.1542	8.3300e-003	0.0000	117.3625
Total	**0.1401**	**0.5328**	**1.0004**	**2.8900e-003**	**176.7328**	**2.0700e-003**	**176.7349**	**17.6572**	**1.9500e-003**	**17.6592**	**0.0000**	**267.6814**	**267.6814**	**0.0145**	**0.0000**	**268.0451**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1109	1.0150	1.0636	1.7500e-003		0.0526	0.0526		0.0495	0.0495	0.0000	150.6212	150.6212	0.0361	0.0000	151.5233
Total	**0.1109**	**1.0150**	**1.0636**	**1.7500e-003**		**0.0526**	**0.0526**		**0.0495**	**0.0495**	**0.0000**	**150.6212**	**150.6212**	**0.0361**	**0.0000**	**151.5233**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0168	0.4352	0.1189	1.5900e-003	34.1570	1.1700e-003	34.1581	3.4145	1.1200e-003	3.4156	0.0000	150.5273	150.5273	6.2100e-003	0.0000	150.6826
Worker	0.1233	0.0976	0.8816	1.3000e-003	142.5759	9.0000e-004	142.5768	14.2428	8.3000e-004	14.2436	0.0000	117.1542	117.1542	8.3300e-003	0.0000	117.3625
Total	**0.1401**	**0.5328**	**1.0004**	**2.8900e-003**	**176.7328**	**2.0700e-003**	**176.7349**	**17.6572**	**1.9500e-003**	**17.6592**	**0.0000**	**267.6814**	**267.6814**	**0.0145**	**0.0000**	**268.0451**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1887	1.7262	1.9493	3.2300e-003		0.0840	0.0840		0.0790	0.0790	0.0000	278.1657	278.1657	0.0662	0.0000	279.8200
Total	**0.1887**	**1.7262**	**1.9493**	**3.2300e-003**		**0.0840**	**0.0840**		**0.0790**	**0.0790**	**0.0000**	**278.1657**	**278.1657**	**0.0662**	**0.0000**	**279.8200**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0251	0.5738	0.1903	2.8700e-003	63.0590	8.7000e-004	63.0599	6.3036	8.3000e-004	6.3045	0.0000	272.2040	272.2040	8.4700e-003	0.0000	272.4157
Worker	0.2136	0.1660	1.4968	2.3100e-003	263.2170	1.6000e-003	263.2186	26.2943	1.4800e-003	26.2958	0.0000	208.0799	208.0799	0.0142	0.0000	208.4337
Total	**0.2387**	**0.7398**	**1.6871**	**5.1800e-003**	**326.2760**	**2.4700e-003**	**326.2785**	**32.5979**	**2.3100e-003**	**32.6002**	**0.0000**	**480.2839**	**480.2839**	**0.0226**	**0.0000**	**480.8494**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1887	1.7262	1.9493	3.2300e-003		0.0840	0.0840		0.0790	0.0790	0.0000	278.1654	278.1654	0.0662	0.0000	279.8197
Total	**0.1887**	**1.7262**	**1.9493**	**3.2300e-003**		**0.0840**	**0.0840**		**0.0790**	**0.0790**	**0.0000**	**278.1654**	**278.1654**	**0.0662**	**0.0000**	**279.8197**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0251	0.5738	0.1903	2.8700e-003	63.0590	8.7000e-004	63.0599	6.3036	8.3000e-004	6.3045	0.0000	272.2040	272.2040	8.4700e-003	0.0000	272.4157
Worker	0.2136	0.1660	1.4968	2.3100e-003	263.2170	1.6000e-003	263.2186	26.2943	1.4800e-003	26.2958	0.0000	208.0799	208.0799	0.0142	0.0000	208.4337
Total	**0.2387**	**0.7398**	**1.6871**	**5.1800e-003**	**326.2760**	**2.4700e-003**	**326.2785**	**32.5979**	**2.3100e-003**	**32.6002**	**0.0000**	**480.2839**	**480.2839**	**0.0226**	**0.0000**	**480.8494**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0269	20.0269	6.4800e-003	0.0000	20.1888
Paving	5.0800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0154**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0269**	**20.0269**	**6.4800e-003**	**0.0000**	**20.1888**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8000e-004	6.9000e-004	6.2000e-003	1.0000e-005	1.0895	1.0000e-005	1.0895	0.1088	1.0000e-005	0.1088	0.0000	0.8613	0.8613	6.0000e-005	0.0000	0.8627
Total	**8.8000e-004**	**6.9000e-004**	**6.2000e-003**	**1.0000e-005**	**1.0895**	**1.0000e-005**	**1.0895**	**0.1088**	**1.0000e-005**	**0.1088**	**0.0000**	**0.8613**	**0.8613**	**6.0000e-005**	**0.0000**	**0.8627**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.1019	0.1458	2.3000e-004		5.1000e-003	5.1000e-003		4.6900e-003	4.6900e-003	0.0000	20.0268	20.0268	6.4800e-003	0.0000	20.1888
Paving	5.0800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0154**	**0.1019**	**0.1458**	**2.3000e-004**		**5.1000e-003**	**5.1000e-003**		**4.6900e-003**	**4.6900e-003**	**0.0000**	**20.0268**	**20.0268**	**6.4800e-003**	**0.0000**	**20.1888**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.8000e-004	6.9000e-004	6.2000e-003	1.0000e-005	1.0895	1.0000e-005	1.0895	0.1088	1.0000e-005	0.1088	0.0000	0.8613	0.8613	6.0000e-005	0.0000	0.8627
Total	**8.8000e-004**	**6.9000e-004**	**6.2000e-003**	**1.0000e-005**	**1.0895**	**1.0000e-005**	**1.0895**	**0.1088**	**1.0000e-005**	**0.1088**	**0.0000**	**0.8613**	**0.8613**	**6.0000e-005**	**0.0000**	**0.8627**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.3200e-003	0.0430	0.0598	1.0000e-004		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	8.4257	8.4257	5.0000e-004	0.0000	8.4383
Total	**2.0444**	**0.0430**	**0.0598**	**1.0000e-004**		**2.3400e-003**	**2.3400e-003**		**2.3400e-003**	**2.3400e-003**	**0.0000**	**8.4257**	**8.4257**	**5.0000e-004**	**0.0000**	**8.4383**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	9.0700e-003	0.0818	1.3000e-004	14.3811	9.0000e-005	14.3812	1.4366	8.0000e-005	1.4367	0.0000	11.3686	11.3686	7.7000e-004	0.0000	11.3879
Total	**0.0117**	**9.0700e-003**	**0.0818**	**1.3000e-004**	**14.3811**	**9.0000e-005**	**14.3812**	**1.4366**	**8.0000e-005**	**1.4367**	**0.0000**	**11.3686**	**11.3686**	**7.7000e-004**	**0.0000**	**11.3879**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.3200e-003	0.0430	0.0598	1.0000e-004		2.3400e-003	2.3400e-003		2.3400e-003	2.3400e-003	0.0000	8.4257	8.4257	5.0000e-004	0.0000	8.4383
Total	**2.0444**	**0.0430**	**0.0598**	**1.0000e-004**		**2.3400e-003**	**2.3400e-003**		**2.3400e-003**	**2.3400e-003**	**0.0000**	**8.4257**	**8.4257**	**5.0000e-004**	**0.0000**	**8.4383**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0117	9.0700e-003	0.0818	1.3000e-004	14.3811	9.0000e-005	14.3812	1.4366	8.0000e-005	1.4367	0.0000	11.3686	11.3686	7.7000e-004	0.0000	11.3879
Total	**0.0117**	**9.0700e-003**	**0.0818**	**1.3000e-004**	**14.3811**	**9.0000e-005**	**14.3812**	**1.4366**	**8.0000e-005**	**1.4367**	**0.0000**	**11.3686**	**11.3686**	**7.7000e-004**	**0.0000**	**11.3879**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Integrate Below Market Rate Housing

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7808	5.1972	8.3893	0.0242	1.4295	0.0115	1.4410	0.3836	0.0108	0.3943	0.0000	2,245.0595	2,245.0595	0.1507	0.0000	2,248.8277
Unmitigated	0.7924	5.2679	8.6834	0.0251	1.5047	0.0120	1.5167	0.4038	0.0112	0.4150	0.0000	2,330.9978	2,330.9978	0.1542	0.0000	2,334.8526

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,740.80	1,740.80	1740.80	3,870,975	3,677,426
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	1,740.80	1,740.80	1,740.80	3,870,975	3,677,426

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	6.88	6.88	6.88	40.20	19.20	40.60	86	11	3
Other Asphalt Surfaces	16.40	9.50	11.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.40	9.50	11.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Other Asphalt Surfaces	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Parking Lot	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	922.4008	922.4008	0.0211	4.3500e-003	924.2247
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	922.4008	922.4008	0.0211	4.3500e-003	924.2247
NaturalGas Mitigated	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	265.9567	265.9567	5.1000e-003	4.8800e-003	267.5371
NaturalGas Unmitigated	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	265.9567	265.9567	5.1000e-003	4.8800e-003	267.5371

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	4.98384e+006	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	265.9567	265.9567	5.1000e-003	4.8800e-003	267.5371
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0269**	**0.2297**	**0.0977**	**1.4700e-003**		**0.0186**	**0.0186**		**0.0186**	**0.0186**	**0.0000**	**265.9567**	**265.9567**	**5.1000e-003**	**4.8800e-003**	**267.5371**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	4.98384e+006	0.0269	0.2297	0.0977	1.4700e-003		0.0186	0.0186		0.0186	0.0186	0.0000	265.9567	265.9567	5.1000e-003	4.8800e-003	267.5371
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0269**	**0.2297**	**0.0977**	**1.4700e-003**		**0.0186**	**0.0186**		**0.0186**	**0.0186**	**0.0000**	**265.9567**	**265.9567**	**5.1000e-003**	**4.8800e-003**	**267.5371**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.55528e+006	896.5750	0.0205	4.2300e-003	898.3478
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	44800	25.8259	5.9000e-004	1.2000e-004	25.8770
Total		**922.4008**	**0.0211**	**4.3500e-003**	**924.2247**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.55528e+006	896.5750	0.0205	4.2300e-003	898.3478
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	44800	25.8259	5.9000e-004	1.2000e-004	25.8770
Total		**922.4008**	**0.0211**	**4.3500e-003**	**924.2247**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.5366	0.0280	2.3797	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	4.5016	4.5016	3.7600e-003	1.0000e-005	4.5989
Unmitigated	1.5366	0.0280	2.3797	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	4.5016	4.5016	3.7600e-003	1.0000e-005	4.5989

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2038					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2609					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	6.0000e-005	5.3000e-004	2.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6146	0.6146	1.0000e-005	1.0000e-005	0.6183
Landscaping	0.0719	0.0274	2.3795	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	3.8870	3.8870	3.7500e-003	0.0000	3.9806
Total	**1.5366**	**0.0280**	**2.3798**	**1.3000e-004**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**4.5016**	**4.5016**	**3.7600e-003**	**1.0000e-005**	**4.5989**

6.2 Area by SubCategory

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.2038					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2609					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	6.0000e-005	5.3000e-004	2.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6146	0.6146	1.0000e-005	1.0000e-005	0.6183
Landscaping	0.0719	0.0274	2.3795	1.3000e-004		0.0132	0.0132		0.0132	0.0132	0.0000	3.8870	3.8870	3.7500e-003	0.0000	3.9806
Total	**1.5366**	**0.0280**	**2.3798**	**1.3000e-004**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**4.5016**	**4.5016**	**3.7600e-003**	**1.0000e-005**	**4.5989**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	197.8373	0.5479	0.0137	215.6298
Unmitigated	247.2966	0.6849	0.0172	269.5372

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	20.8493 / 13.1441	247.2966	0.6849	0.0172	269.5372
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**247.2966**	**0.6849**	**0.0172**	**269.5372**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	16.6794 / 10.5153	197.8373	0.5479	0.0137	215.6298
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**197.8373**	**0.5479**	**0.0137**	**215.6298**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	7.4701	0.4415	0.0000	18.5068
Unmitigated	29.8803	1.7659	0.0000	74.0271

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	147.2	29.8803	1.7659	0.0000	74.0271
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**29.8803**	**1.7659**	**0.0000**	**74.0271**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	36.8	7.4701	0.4415	0.0000	18.5068
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**7.4701**	**0.4415**	**0.0000**	**18.5068**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment "B"

Natural Environment Study (Minimal Impacts)

State Route 86 and Pitzer Road Improvements and Heber Meadows Affordable Housing Project

Intersection of State Route 86 and Pitzer Road, and Southwest Corner of Pitzer Road and Correll Road

Heber, Imperial County, California

June 2021

STATE OF CALIFORNIA
Department of Transportation
and Imperial County

Prepared By: _____ Date: 06/01/21

Travis J. McGill, Director
(714) 716-5050
ELMT Consulting, Inc.
2201 N. Grand Avenue #10098
Santa Ana, California 92711

1. Introduction

This Natural Environment Study – Minimal Impact (NES-MI) report has been prepared to support the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) documentation for the State Route 86 and Pitzer Road Improvements and Heber Meadows Affordable Housing Project (Project) the located in the unincorporated Community of Heber, Imperial County, California. The California Department of Transportation is the lead agency under NEPA and the Imperial County (County) is the lead agency under CEQA.

Further, the NES-MI was prepared to document baseline conditions of the habitat and to identify special-status species[1] species and natural communities of special concern potentially occurring within the (BSA)[2] that could pose a constraint to implementation of the Project. This NES-MI contains the findings of a habitat and jurisdictional assessment prepared for the Project.

1.1 Project History

1.1.1 Project Purpose and Need

In coordination with Caltrans, Imperial County elected to combine the State Route 86/Pitzer Road Improvements Project and the Heber Meadows Affordable Housing Project. The State Route 86 and Pitzer Road Improvements Project was a Condition of Approval in the Mitigated Negative Declaration (MND) that was adopted in 2005 for a 290-unit housing project referred to as Heber Meadows. The Heber Meadows developed agreed to construct the State Route 86 and Pitzer Road improvements as part of the entitlement process for what will be a five-phase affordable housing project. It should be noted that a portion of the larger Heber Meadows site, approved in 2005, have been constructed.

1.2 Project Description

The proposed Project includes a 320-unit affordable housing project on a 16-acre site approximately 0.4 mile north and west of the State Route 86/Pitzer Road intersection. The original 290-unit housing project will be increased by 30 units. In addition, the State Route 86/Pitzer Road intersection is proposed to include a round-about intersection with improvements according along State Route 86 and Pitzer Road.

The Project is generally located south of Interstate 8, west of State Route 111, north of the United States/Mexico Border, and east of the New River in the unincorporated Community of Heber, Imperial County, California (Exhibit 1, *Regional Vicinity*). The BSA is depicted on the Heber United States Geological Survey (USGS) 7.5-minute quadrangle

[1] As used in this report, "special-status" refers to plant and wildlife species that are federally and State listed, proposed, or candidates; plant species that have been designated with a California Native Plant Society Rare Plant Rank; wildlife species that are designated by the CDFW as fully protected, species of special concern, or watch list species; and specially protected natural vegetation communities as designated by the CDFW.

[2] The BSA is defined as the area of analysis for direct effects, indirect effects, and cumulative effects within the project boundary.

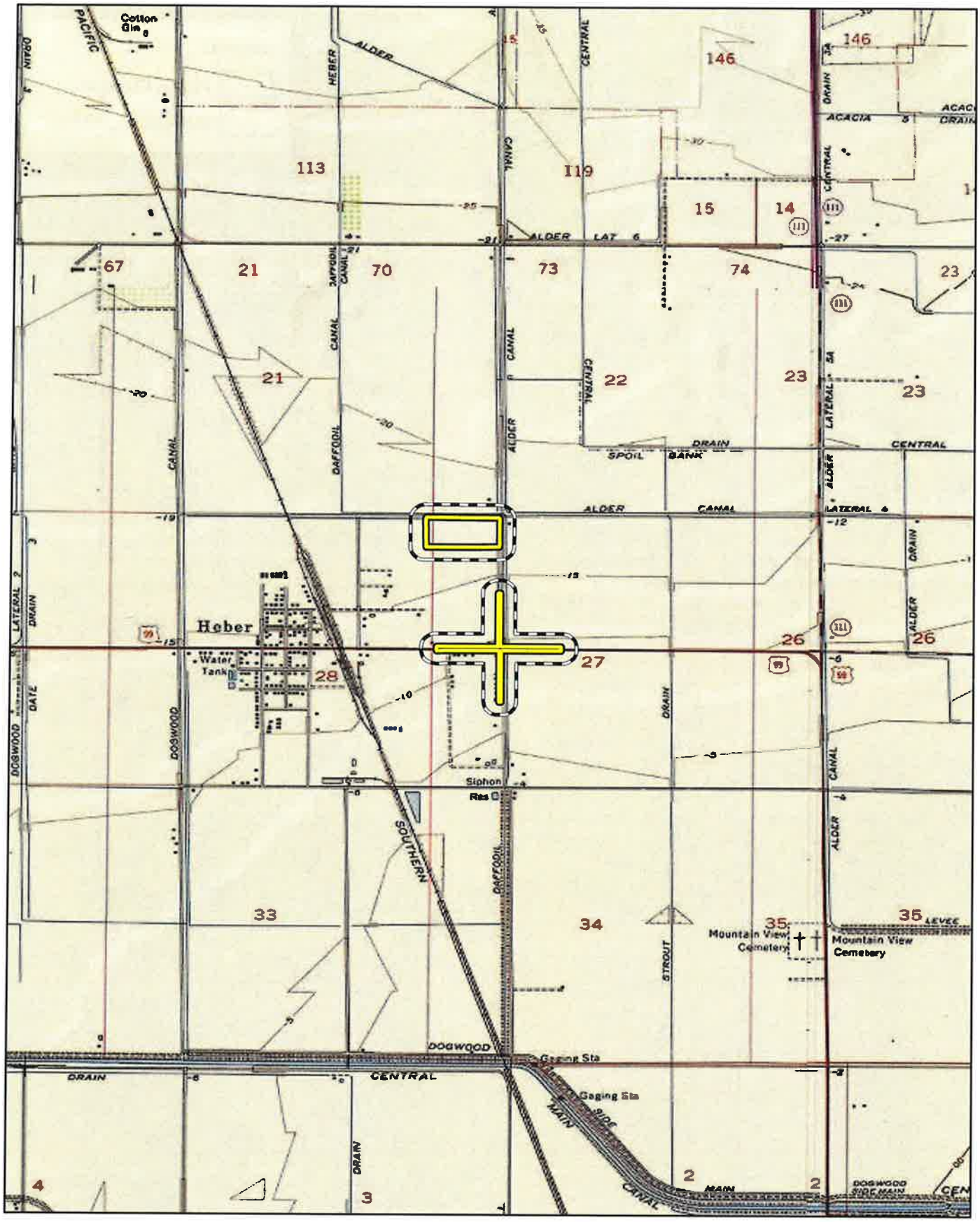
in Sections 27 and 28 of Township 16 South, Range 14 East (Exhibit 2, *Site Vicinity*). Specifically, the State Route 86 and Pitzer Road Improvements portion of the Project is located at the intersection of State Route 86 (Main Street/Heber Road) and Pitzer Road and will extend approximately 1,000 liner feet along State Route 86 and Pitzer Road, and the Heber Meadows Affordable Housing portion of the Project is bound by Correll Road to the North, Bloomfield Street to the west, Pitzer Road to the south within Assessor Parcel Number (APN) 054-601-016 (Exhibit 3, *Biological Study Area*).

STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Regional Vicinity

Source: ESRI World Street Map, Imperial County

Exhibit 1



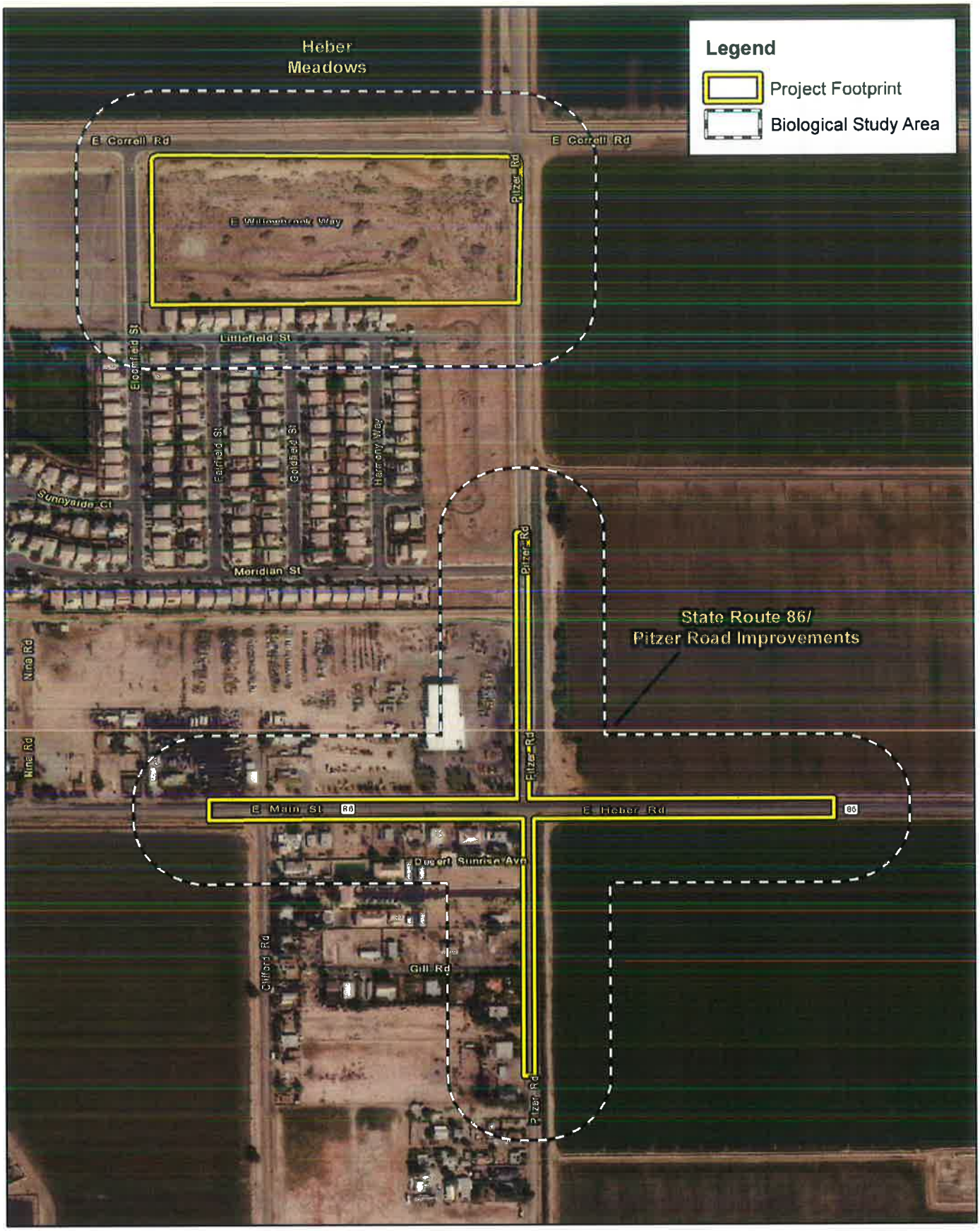
STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Site Vicinity

0 1,250 2,500 5,000 Feet

Source: ESRI USA Topographic Map, Imperial County

Exhibit 2



STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Biological Study Area

Exhibit 3

2. Study Methods

This section provides the regulatory framework by which biological resources were reviewed for the Project and the methods used in determining the suitability of the habitat for a given biological resource. There are several overlying federal, state, and local biological resources regulations and policies that pertain to this Project. These policies are summarized below, along with a brief description of how they relate to the proposed Project's planning, permitting, and implementation.

2.1 Regulatory Requirements

The Project will be implemented to satisfy the requirements of applicable federal and State regulations, as well as local policies, ordinances, or adopted plans protecting biological resources. Only those regulations and/or environmental protection documents that are directly applicable to the permitting and implementation of this project are outlined below. General environmental regulations that are not applicable to the conditions of this project site are not described.

FEDERAL

National Environmental Policy Act

The National Environmental Policy Act (NEPA) directs a "systematic, interdisciplinary approach" to planning and decision making and requires environmental statements for "major federal actions significantly affecting the quality of the human environment". Implementing regulations by the Council of Environmental Quality (40 *Code of Federal Regulations* [CFR], Parts 1500–1508) require federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts.

Federal Endangered Species Act of 1973

As defined within the Federal Endangered Species Act (FESA) of 1973, an endangered species is any animal or plant listed by regulation as being in danger of extinction throughout all or a significant portion of its geographical range. A threatened species is any animal or plant that is likely to become endangered within the foreseeable future throughout all or a significant portion of its geographical range. Without a special permit, federal law prohibits the "take" of any individuals or habitat of federally listed species. Under Section 9 of the FESA, take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." The term "harm" has been clarified to include "any act which actually kills or injures fish or wildlife, and emphasizes that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." Enforcement of FESA is administered by the United States Fish and Wildlife Service (USFWS).

Critical habitat is designated for the survival and recovery of species listed as threatened or endangered under the FESA. Critical habitat includes those areas occupied by the

species, in which are found physical and biological features that are essential to the conservation of an FESA listed species and which may require special management considerations or protection. Critical habitat may also include unoccupied habitat if it is determined that the unoccupied habitat is essential for the conservation of the species.

Whenever Federal agencies authorize, fund, or carry out actions that may adversely modify or destroy Critical Habitat, they must consult with USFWS under Section 7 of the FESA. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highway Administration or a permit from the Corps).

If USFWS determines that Critical Habitat will be lost or adversely modified from a proposed action, the USFWS will develop reasonable and prudent alternatives in cooperation with Caltrans to ensure the purpose of the proposed action can be achieved without loss of Critical Habitat. If the action is not likely to adversely modify or destroy critical habitat, USFWS will include a statement in its biological opinion concerning any incidental take that may be authorized and specify terms and conditions to ensure the agency is in compliance with the opinion.

Clean Water Act

Section 404 of the Clean Water Act

Since 1972, the Corps and EPA have jointly regulated the filling of waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, the placement of sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States."

In April of 2020, the Corps and the EPA provided a new definition for *waters of the United States* [Federal Register, Vol. 85, No. 77 (April 21, 2020)] which encompass:

- The territorial seas and traditional navigable waters;
- Perennial and intermittent tributaries that contribute surface water flow to such waters;
- Certain lakes, ponds, and impoundments of jurisdictional waters; and
- Wetlands adjacent to other jurisdictional waters.

Additionally, the new definition identifies 12 categories of those waters and features that are excluded from the definition of "waters of the United State, such as features that only contain water in direct response to rainfall (e.g., ephemeral features), groundwater, many ditches, prior converted cropland, and waste treatment systems. The final rule excludes

from the definition of "waters of the United States" all waters or features not mentioned above. In addition to this general exclusion, the final rule specifically clarifies that waters of the United States do not include the following:

- Groundwater, including groundwater drained through subsurface drainage systems;
- Ephemeral features that flow only indirect response to precipitation, including ephemeral streams, swales, gullies, rills, and pools;
- Diffuse stormwater runoff and directional sheet flow over upland;
- Ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations;
- Prior converted cropland;
- Artificially irrigated areas that would revert to upland if artificial irrigation ceases;
- Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters;
- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
- Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff;
- Groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters; and
- Waste treatment systems.

The Corps grants two types of permits, individual and nationwide. Project-specific individual permits are required for certain activities that may have a potential for more than a minimal impact and necessitate a detailed application. The most common type of permit is a nationwide permit. Nationwide permits authorize activities on a nationwide basis unless specifically limited, and are designed to regulate with little delay or paperwork certain activities having minimal impacts. Nationwide permits typically take two to three months to obtain whereas individual permits can take a year or more. To qualify for a nationwide permit, specific criteria must be met. If the criteria restrictions are met, permittees may proceed with certain activities without notifying the Corps. Some nationwide permits require a pre-construction notification before activities can begin.

Section 401 of the Clean Water Act

Applicants for a federal license or permit for activities which may discharge to waters of the U.S. must seek Water Quality Certification from the state or Indian tribe with jurisdiction.[3] Such Certification is based on a finding that the discharge will meet water quality standards and other applicable requirements. In California, RWQCBs issue or deny Certification for discharges within their geographical jurisdiction. Water Quality

[3] Title 33, United States Code, Section 1341; Clean Water Act Section.

Certification must be based on a finding that the proposed discharge will comply with water quality standards, which are defined as numeric and narrative objectives in each RWQCB's Basin Plan. Where applicable, the State Water Resources Control Board has this responsibility for Projects affecting waters within the jurisdiction of multiple RWQCB. The RWQCB's jurisdiction extends to all waters of the state and to all waters of the U.S., including wetlands.

Section 401 of the CWA requires that "any applicant for a federal permit for activities that involve a discharge to waters of the State, shall provide the federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, before the Corps will issue a Section 404 permit, applicants must apply for and receive a Section 401 water quality certification from the RWQCB.

Migratory Bird Treaty Act

Pursuant to the Migratory Bird Treaty Act (MBTA) (16 U.S. Government Code [USC] 703) of 1918, as amended In 1972, federal law prohibits the taking of migratory birds or their nests or eggs (16 USC 703; 50 CFR 10, 21). The statute states:

> *Unless and except as permitted by regulations made as hereinafter provided in this subchapter, it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill...any migratory bird, any part, nest, or egg of any such bird...included in the terms of the [Migratory Bird] conventions…*

The Act covers the taking of any nests or eggs of migratory birds, except as allowed by permit pursuant to 50 CFR, Part 21. Disturbances causing nest abandonment and/or loss of reproductive effort (i.e., killing or abandonment of eggs or young) may also be considered a "take." This regulation seeks to protect migratory birds and active nests.

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: Accipitridae (kites, hawks, and eagles); Cathartidae (New World vultures); Falconidae (falcons and caracaras); Pandionidae (ospreys); Strigidae (typical owls); and Tytonidae (barn owls)

The provisions of the 1972 amendment to the MBTA protects all species and subspecies of the families listed above. The MBTA protects over 800 species including geese, ducks, shorebirds, raptors, songbirds and many relatively common species.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) provides for the protection of the environment within the State of California by establishing State policy to prevent

significant, avoidable damage to the environment through the use of alternatives or mitigation measures for projects. It applies to actions directly undertaken, financed, or permitted by State lead agencies. If a project is determined to be subject to CEQA, the lead agency will be required to conduct an Initial Study (IS); if the IS determines that the project may have significant impacts on the environment, the lead agency will subsequently be required to write an Environmental Impact Report (EIR). A finding of non-significant effects will require either a Negative Declaration or a Mitigated Negative Declaration instead of an EIR. Section 15380 of the California Environmental Quality Act Guidelines independently defines "endangered" and "rare" species as those whose survival and reproduction in the wild are in immediate jeopardy, while "rare" species are defined as those who are in such low numbers that they could become endangered if their environment worsens.

California Endangered Species Act

In addition to federal laws, the state of California has its own law called the California Endangered Species Act (CESA), enforced by CDFW. The CESA program maintains a separate listing of species beyond the FESA, although the provisions of each act are similar.

State-listed threatened and endangered species are protected under provisions of the CESA. Activities that may result in "take" of individuals (defined in CESA as; "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by CDFW. Habitat degradation or modification is not included in the definition of "take" under CESA. Nonetheless, CDFW has interpreted "take" to include the destruction of nesting, denning, or foraging habitat necessary to maintain a viable breeding population of protected species.

The CESA considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. State threatened and endangered species are fully protected against take, as defined above.

The CDFW has also produced a species of special concern list to serve as a species watch list. Species on this list are either of limited distribution or their habitats have been reduced substantially, such that a threat to their populations may be imminent. Species of special concern may receive special attention during environmental review, but they do not have formal statutory protection. At the federal level, USFWS also uses the label species of concern, as an informal term that refers to species which might be in need of concentrated conservation actions.

As the Species of Concern designated by USFWS do not receive formal legal protection, the use of the term does not necessarily ensure that the species will be proposed for listing as a threatened or endangered species.

California Department of Fish and Wildlife – Fish and Game Code

Fish and game Code Sections 3503, 3503.5, 3511, and 3513

The CDFW administers the California Fish and Game Code. There are particular sections of the Code that are applicable to natural resource management. For example, Section 3503 of the Code makes it unlawful to destroy any birds' nest or any birds' egges that are protected under the MBTA. Further, any birds in the orders Falconiformes or Strigiformes (Birds of Prey, such as hawks, eagles, and owls) are protected under Section 3503.5 of the Code which makes it unlawful to take, possess, or destroy their nest or eggs. A consultation with CDFW may be required prior to the removal of any bird of prey nest that may occur on a project site. Section 3511 of the Code lists fully protected bird species, where the CDFW is unable to authorize the issuance of permits or licenses to take these species. Pertinent species that are State fully protected include golden eagle (*Aquila chrysaetos*) and white-tailed kite (*Elanus leucurus*). Section 3513 of the Code makes it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Fish and Game Code Sections 1900–1913 (Native Plant Protection Act)

Sections 1900–1913 of the *California Fish and Game Code* were developed to preserve, protect, and enhance Rare and Endangered plants in the state of California. The act requires all state agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFW at least ten days in advance of any change in land use which would adversely impact listed plants. This allows the CDFW to salvage listed plant species that would otherwise be destroyed.

Fish and Game Code Section 1600 et. seq.

Section 1600 *et seq.* of the Fish and Game Code applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. Section 1602 of the Fish and Game Code establishes a fee-based process to ensure that Projects conducted in and around lakes, rivers, or streams do not adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided. Pursuant to Section 1602 of the Fish and Game Code, a notification must be submitted to the CDFW for any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream or use material from a streambed. This includes activities taking place within rivers or streams that flow perennially or episodically and that are defined by the area in which surface water currently flows, or has flowed, over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical and biological indicators.

California Native Plant Society Rare and Endangered Plant Species

Vascular plants listed as rare or endangered by the California Native Plant Society (CNPS), but which have no designated status under state and federal endangered species legislation are defined as follows:

California Rare Plant Rank

1A- Plants Presumed Extirpated in California and either Rare or Extinct Elsewhere
1B- Plants Rare, Threatened, or Endangered in California and Elsewhere
2A- Plants Presumed Extirpated in California, But More Common Elsewhere
2B- Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3- Plants about Which More Information is Needed - A Review List
4- Plants of Limited Distribution - A Watch List

Threat Ranks

.1- Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2- Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
.3- Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

These sections were developed to preserve, protect, and enhance Rare and Endangered plants in the state of California. The act requires all state agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFW at least ten days in advance of any change in land use which would adversely impact listed plants. This allows the CDFW to salvage listed plant species that would otherwise be destroyed.

Porter Cologne Act

The Porter-Cologne Water Quality Control Act charges the State Water Resources Control Board (SWRCB) and the nine RWQCB statewide with protecting water quality throughout California. Typically, the SWRCB and RWQCB act in concert with the Corps under Section 401 of the CWA in relation to permitting fill of federally jurisdictional waters. The Supreme Court acted to limit the regulatory jurisdiction of the Corps under Section 404 of the CWA (USSC 2001). The action did not limit the State's regulatory jurisdiction over Waters of the State (Guzy and Anderson 2001). Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "...any surface or groundwater, including saline waters, within the boundaries of the state." Currently, an applicant would delineate the wetlands on their property utilizing methodology presented in the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory

1987) and the delineation would be verified by the Corps. In cases where an area meets the criteria to be considered a wetland, but the Corps does not have jurisdiction, the applicant is referred to the appropriate RWQCB. In these cases, the Project must receive a permit for Waste Discharge Requirements or a Waiver of Waste Discharge Requirements from the RWQCB. Projects that affect Waters of State are required by the RWQCB to incorporate mitigation. Mitigation ratios are determined on a Project specific basis during the permitting process and are based on the quality of the wetlands impacted by the Project.

2.2 Studies Required

A literature review, and habitat and jurisdictional assessment or field investigation were conducted in support of the preparation of this NES-MI. A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the BSA. Following the literature review, a general habitat and jurisdictional assessment or field investigation was conducted within the BSA to document baseline conditions and determine the potential for the BSA to support special-status biological resources. No protocol or focused surveys were conducted.

2.2.1 Literature Search

Prior to conducting the habitat assessment, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the BSA. The record search was focused on the Heber USGS 7.5-minute quadrangle. Previously recorded occurrences of special-status plant and animal species and their proximity to the BSA were determined through a query of the CDFW California Natural Diversity Database (CNDDB) Rarefind 5, CDFW Biogeographic Information & Observation System (BIOS), the California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the USFWS species listings. In addition, a Species List was obtained from the Carlsbad Field Office of the USFWS via the Information for Planning and Conservation (IPaC) database (Appendix A, *United States Fish and Wildlife Service Species List*).

Literature detailing biological resources previously documented in the vicinity of the BSA and historical land uses were reviewed to understand the extent of disturbances to the habitats on-site. Standard field guides and texts on special-status and non-special-status biological resources were reviewed for habitat requirements, as well as the following resources:

- Google Earth Pro historic aerial imagery (1996 – 2020);

- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[4];
- USFWS Critical Habitat designations for Threatened and Endangered Species;
- IPaC; and
- eBird database.

The literature review provided a baseline from which to inventory the biological resources potentially occurring within the BSA. Additional recorded occurrences of these species found within or near the BSA were derived from database queries. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest special-status plant and animal species occurrences and determine the distance from the BSA. In addition, the goals and objectives of the MSHCP were reviewed for applicability to the BSA.

2.2.2 Field Reviews

A biological report was prepared for the Mitigated Negative Declaration that was prepared in 2005 for the Heber Meadows projects. This report was not used to support the findings in the NES-MI. As a result, no field reviews were conducted for the Project prior to ELMT Consulting's March 24, 2021 field investigation.

2.2.3 Survey Methods

2.3 Personnel and Survey Dates

The BSA was surveyed by ELMT Consulting biologist Jacob H. Lloyd Davies on March 24, 2021.

2.4 Agency Coordination and Professional Contacts

No agency coordination or professional contacts have been initiated at this time for the Project. A list of threatened and endangered species that may occur in the vicinity of the Project was received from the USFWS (refer to Appendix A).

2.5 Limitations That May Influence Results

All field surveys were conducted in accordance with applicable protocols and in a way to maximize the detectability of special-status species that may have been present within the BSA during the time of the survey. The survey was conducted by a highly experienced and qualified biologist during good weather conditions. Therefore, no limitations that may influence the results of field studies associated with this Project are known to have occurred.

[4] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

3. Results: Environmental Setting

The Project is generally located south of Interstate 8, west of State Route 111, north of the United States/Mexico Border, and east of the New River in the unincorporated Community of Heber, Imperial County, California. The BSA is depicted on the Heber United States Geological Survey (USGS) 7.5-minute quadrangle in Sections 27 and 28 of Township 16 South, Range 14 East. Specifically, the State Route 86 and Pitzer Road Improvements portion of the Project is located at the intersection of State Route 86 (Main Street/Heber Road) and Pitzer Road and will extend approximately 1,000 liner feet along State Route 86 and Pitzer Road, and the Heber Meadows Affordable Housing portion of the Project is bound by Correll Road to the North, Bloomfield Street to the west, Pitzer Road to the south within Assessor Parcel Number (APN) 054-601-016.

3.1 Description of the Existing Physical and Biological Conditions

3.1.1 Study Area

The BSA identified for the Project includes the limits of disturbance and a 250-foot buffer. The limits of disturbance include the grading limits within the State Route 86/Pitzer Road Improvements portion of the site within Caltrans right-of-way, and the approximately 16-acre site for the Heber Meadows Affordable Housing Project. The 250-foot buffer was established around the proposed limits of disturbance to evaluate adjacent areas that have the potential to be indirectly affected by project implementation. Areas immediately surrounding the limits of disturbance, but within the BSA, are composed of agricultural land uses, existing developments (e.g., transportation land uses and residential developments), roadways, pedestrian sidewalks, and undeveloped parcels.

Since there are no natural plant communities or special-status plant communities within the proposed limits of disturbance or immediate surrounding area, the BSA was limited to the 250-foot buffer.

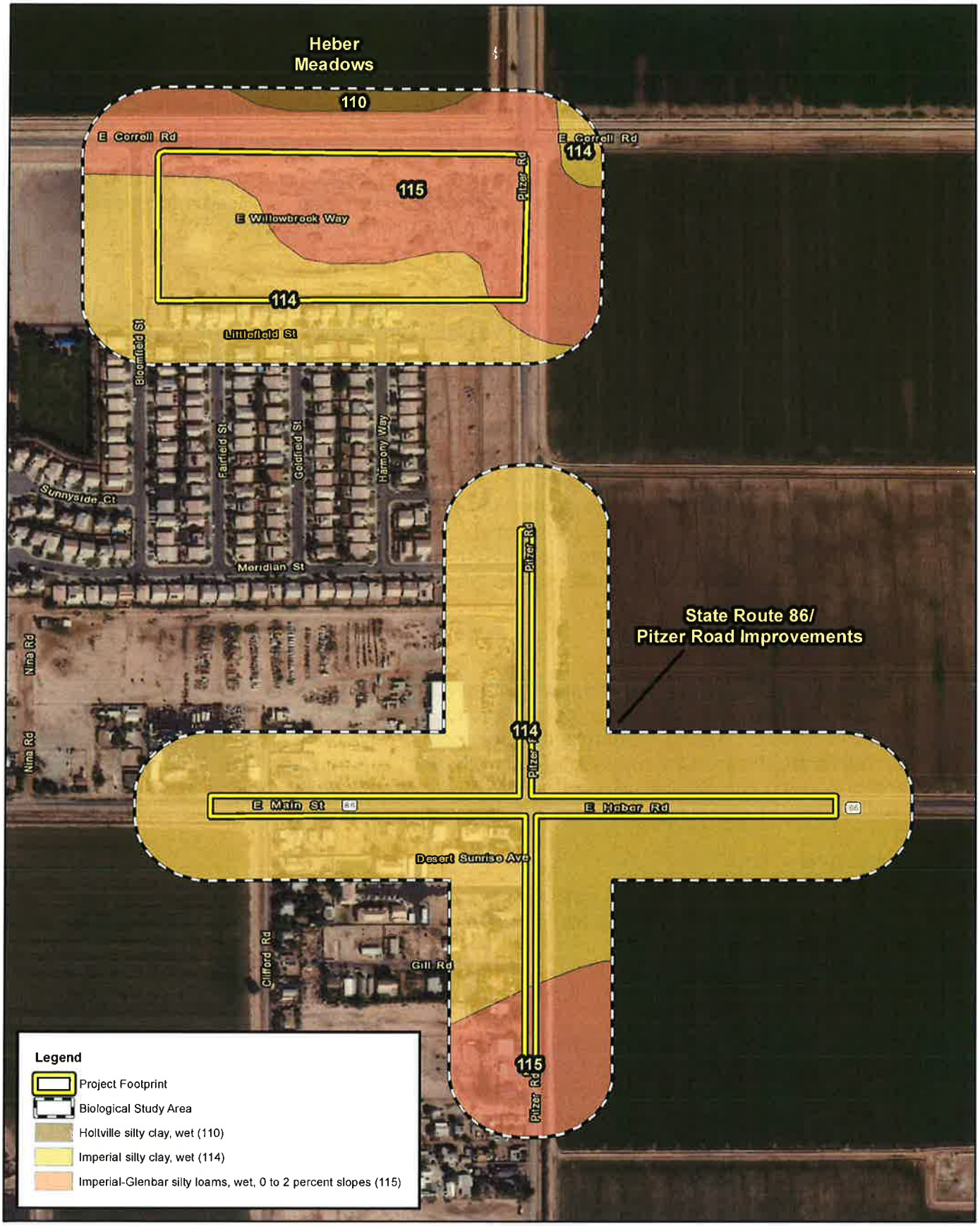
3.1.2 Physical Conditions

Surface elevations within the BSA range from approximately -20 to -5 feet above mean sea level (msl) with lowered topography in the northwestern and southeastern portions of the BSA. On-site and adjoining soils were researched prior to the field visit using the USDA NRCS, Soil Survey. According to the Soil Survey, soils that have been mapped within the BSA include: Holtville silty clay (wet), Imperial silty clay (wet), and Imperial-Glenbar silty clay loams (wet, 0 to 2 percent slopes) (Exhibit 4, Soils).

3.1.3 Biological Conditions

Plant Communities

The BSA consists of existing development and vacant land that varies in levels of disturbance. The northern, eastern, and southeastern portions of the BSA consists primarily of agricultural land use, and the western portion of the BSA consists primarily of existing residential and commercial developments. Within these land uses and



STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Soils

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, Imperial County

Exhibit 4

developments, the BSA supports vacant land that formerly supported agricultural activities. In addition, the southern portion of the BSA supports developed land cover types associated with State Route 86.

As a result of existing developments, land uses, and disturbances within the BSA, no plant communities were observed. There were three (3) human-modified areas observed within the BSA: agriculture, disturbed, and developed (Exhibit 5, Vegetation).

Disturbed

Disturbed areas are generally areas that have been subject to a high level of human disturbances and no longer comprise a native plant community. These areas are unpaved and are primarily or entirely devoid of vegetation, or support ruderal/weedy plant species. Within the BSA, disturbed areas are present within the limits of disturbance for the Heber Meadows Project at the southeast corner of the intersection of Correll Road and Pitzer Road; within right-of-way associated with Correll Road, Pitzer Road, and State Route 86; and a vacant area northeast of the intersection of Pitzer Road and State Route 86. More prominent plant species observed within the on-site disturbed areas include big saltbush (*Atriplex lentiformis*), bermudagrass (*Cynodon dactylon*), Russian thistle (*Salsola tragus*), nettle leaf goosefoot (*Chenopodium murale*), cheeseweed (*Malva parviflora*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), London rocket (*Sisybrium irio*), tamarisk (*Tamarix* sp.), Mediterranean canarygrass (*Phalaris minor*), and Mexican palo verde (*Parkinsonia aculeata*).

Developed

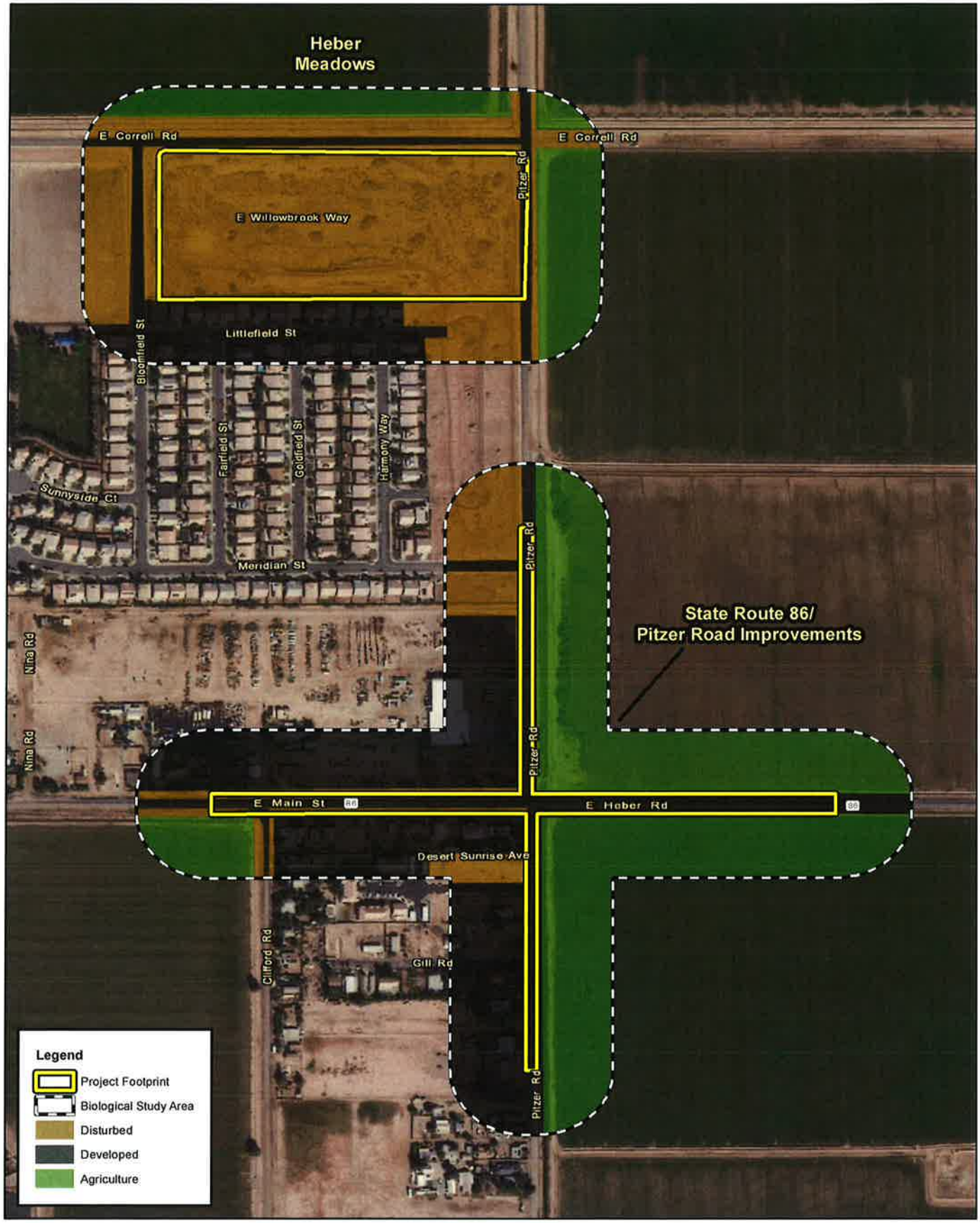
Developed areas generally encompass all buildings, as well as all paved, impervious surfaces and areas that are covered with gravel. Within the BSA, the developed areas are comprised of existing residential and commercial development, and roadways (e.g., Correll Road, Pitzer Road, and State Route 86). For the purposes of this NES-MI report, and due to the complete removal of natural plant communities for agricultural activities, land supporting agricultural uses was included as developed.

Agricultural

Within the BSA several agricultural crops occur that are actively cultivated. In addition three are concrete lined v-ditches along the perimeter of the agricultural fields that convey water for the corps.

Wildlife

Plant communities provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed during the habitat assessment or that are expected to occur within the BSA. The discussion is to be used a general reference and is limited by the season, time of day, and weather conditions in which the field survey was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation.



STATE ROUTE 86 AND PITZER ROAD IMPROVEMENTS PROJECT
NATURAL ENVIRONMENT STUDY - MINIMAL IMPACTS

Vegetation

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Imperial County

Exhibit 5

Fish

No fish species were observed within the BSA during the habitat assessment. The BSA supports an array of canals associated with agricultural activities. Common fish species that may be expected to occur within the canals include mosquitofish (*Gambusia* spp.), which are common introduced species association with vector control efforts for mosquitoes. Native fish species are not expected to occur due to the canals being entirely artificial and the lack of connection to natural aquatic habitats.

Amphibians

No amphibian species were observed within the BSA during the field investigation. The BSA supports actively irrigated agricultural land and an array of associated canals that have the potential to provide suitable habitat for amphibian species adapted to such conditions. Common amphibian species that may be expected to occur within the canals include tree frogs (*Pseudacris* spp.), toads (*Anaxyrus* spp.), and American bullfrog (*Lithobates catesbeianus*), which occur commonly in heavily irrigated agricultural settings. Due to the high level of anthropogenic disturbances on-site, no special-status amphibian species are expected to occur within the BSA.

Reptiles

The BSA provides a limited amount of habitat for a few reptile species adapted to a high degree of human disturbance associated with the on-site disturbances and surrounding development. Western long-tailed brush lizard (*Urosaurus graciosus graciosus*) was the only reptilian species observed during the habitat assessment. Other common reptilian species that may be expected to occur include western side-blotched lizard (*Uta stansburiana elegans*) and Sonoran gopher snake (*Pituophis catenifer affinis*). Due to the high level of anthropogenic disturbances on-site, no special-status reptilian species are expected to occur within the BSA.

Birds

The BSA provides minimal foraging habitat for bird species adapted to a high degree of human disturbance. Bird species detected during the field surveys include northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhouse mexicanus*), American crow (*Corvus brachyrhynchos*), lesser goldfinch (*Spinus psaltria*), red-tailed hawk (*Buteo jamaicensis*), rock pigeon (*Columba livia*), and burrowing owl (*Athene cuincularia*).

It should be noted that

Mammals

The BSA provides minimal foraging habitat for mammalian species adapted to human presence and disturbance. No mammalian species were observed during the habitat assessment. Common mammalian species expected to occur include Audubon's cottontail (*Sylvilagus audubonii*), Botta's pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), deer mouse (*Peromyscus* sp.), and

California ground squirrel (*Orospermophilus beecheyi*). No bat species are expected to occur due to a lack of suitable roosting habitat (i.e., suitable trees, crevices) within the BSA.

Jurisdictional Drainages

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge or fill materials into "waters of the United States" pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFW regulates alterations to streambed and bank under Fish and Wildlife Code Sections 1600 et seq., and the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

No jurisdictional drainage and/or wetland features were observed on the project site during the field investigation. Further no blueline streams, have been recorded on the project site. A review of USFW's National Wetlands Inventory determined that no resources occur within or adjacent to the site. Therefore, development of the project will not result in impacts to Corps, Regional Board, or CDFW jurisdiction and regulatory approvals will not be required.

It should be noted that several agricultural concrete lined v-ditches were observed within the BSA. These v-ditches excavated wholly in the uplands and did not replace any blueline steams or other drainage features, as part of the agricultural activities. The concrete v-ditches have been continually used to convey water to the active crops and were determined not to fall under the regulatory authority of the Corps, Regional Board or CDFW.

3.1.4 Habitat Connectivity

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

The proposed Project will be confined to existing disturbed and developed areas and is surrounded by development to the east and south, and agricultural fields to the north and east, which have removed natural plant communities from the surrounding area. The nearest wildlife corridor occurs within the New River, approximately 5 miles west of the site. The site is isolated from the wash by existing residential, commercial, and industrial development, and agricultural land uses. As a result, implementation of the Project is not

anticipated to disrupt or have any adverse effects on any migratory corridors or linkages in the surrounding area.

3.2 Regional Species and Habitats and Natural Communities of Concern

The CNDDB was queried for reported locations of special-status plant and animal species as well as natural communities of special concern in the Heber USGS 7.5-minute quadrangle. A search of published records within these quadrangles was conducted using the CNDDB Rarefind 5 online software and the CDFW BIOS database. The CNPS Inventory of Rare and Endangered Plants of California supplied information regarding the distribution and habitats of vascular plants in the vicinity of the BSA. In addition, the IPaC database was searched for special-status wildlife species that the USFWS determined to have the potential to occur within the vicinity of the BSA. The IPaC database search is based off of specific site boundaries, rather than the quadrangle(s) that a project occurs in. It also does not necessarily indicate special regulatory protection, as many species listed in the IPaC database are migratory birds that are only protected by the MBTA.

The CNDDB, CNPS, and IPaC records searches identified eight (8) special-status plant species and eighteen (18) special-status animal species as having the potential to occur within the BSA (Appendix C, *Potentially Occurring Special-Status Biological Resources*). Further, no special-status plant communities were identified as having the potential to occur within the BSA. Appendix C summarizes conclusions from analysis and field surveys regarding the potential occurrence of special-status plant species within the BSA. The habitat assessment was used to assess the ability of the plant communities found on-site to provide suitable habitat for relevant special-status plant and animal species. No special-status species were identified within the BSA during the March 24, 2021 site investigation.

CRITICAL HABITAT

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or not. All federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a CWA Permit from the Corps). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

The BSA is not located within federally designated Critical Habitat (Exhibit 6, *Critical Habitat*). The nearest federally designated Critical Habitat is located approximately 27 miles east of the BSA for Pierson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*). Therefore, consultation with USFWS will not be required for the loss or adverse modification of Critical Habitat.

4. Results: Biological Resources, Discussion of Impacts, and Mitigation

4.1 Habitats and Natural Communities of Special Concern

Habitats are considered to be of special concern based on (1) federal, State, or local laws regulating their development; (2) limited distributions; and/or (3) support the habitat requirements of special-status plants or animals. State and/or federal jurisdictional features (i.e., lakes, rivers, streams, ephemeral drainages, jurisdictional streambed and bank, and wetlands) are also considered natural communities of special concern.

No natural community of special concern were identified by the CNDDB during the records search as occurring within the Heber USGS 7.5-minute quadrangle. No natural communities of special concern were observed with the BSA. As a result, no natural communities of special concern will be impacted from implementation of the Project.

4.2 Special Status Plant Species

Plants are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the presence of habitat required by the special-status plants occurring on site. {Insert Name(s)} plant(s) was/were found to be present within the BSA.

A total of eight (8) special-status plant species were identified by the CNDDB, CNPS, and IPaC records searches as potentially occurring within the BSA (refer to Appendix C). No special-status plant species were observed within the BSA during the field survey. The entirety of the project site has been subject to anthropogenic disturbances from historic agricultural activities, grading, and surrounding development. These disturbances have reduced, if not eliminated, the suitability of the habitat to support special-status plant species known to occur in the general vicinity of the project site. Although the field investigation was not conducted during the blooming season for the majority of the special-status plant species known to occur in the general vicinity of the BSA, based on habitat requirements for specific special-status plant species and the availability and quality of habitats needed by each species, it was determined that the BSA does not provide suitable habitat for any of the special-status plant species known to occur in the area and are presumed to be absent from the BSA.

4.3 Special Status Animal Species

Animals are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements

of special-status animals occurring on site. {Insert Name(s)}animal(s) was found to be present within the BSA.

A total of eighteen (18) special-status animal species were identified by the CNDDB and IPaC records search as potentially occurring within the BSA (refer to Appendix C). No special-status animal species were observed within the BSA during the habitat assessment. It should be noted that a burrowing owl was observed outside of the northeast portion of the norhtenr BSA during the field investigation. Based on the results of the habitat assessment, one (1) special-status animal species was determined to have a high potential to occur within the BSA: burrowing owl. All other special-status animal species are not expected to occur and are presumed absent from the BSA based on specific habitat requirements for special-status animal species, availability and quality of habitat within the BSA, and known distributions. No direct or indirect impacts to special-status animal species are anticipated from implementation of the Project

4.3.1 Discussion of Burrowing Owl

The burrowing owl is currently listed as a California Species of Special Concern. It is a grassland specialist distributed throughout western North America where it occupies open areas with short vegetation and bare ground within shrub, desert, and grassland environments. Burrowing owls use a wide variety of arid and semi-arid environments with well-drained, level to gently-sloping areas characterized by sparse vegetation and bare ground (Haug and Didiuk 1993; Dechant et al. 1999). Burrowing owls are dependent upon the presence of burrowing mammals (such as ground squirrels) whose burrows are used for roosting and nesting (Haug and Didiuk 1993). The presence or absence of colonial mammal burrows is often a major factor that limits the presence or absence of burrowing owls. Where mammal burrows are scarce, burrowing owls have been found occupying man-made cavities, such as buried and non-functioning drainpipes, stand-pipes, and dry culverts. Burrowing mammals may burrow beneath rocks and debris or large, heavy objects such as abandoned cars, concrete blocks, or concrete pads. They also require open vegetation allowing line-of-sight observation of the surrounding habitat to forage as well as watch for predators.

4.3.1.1 Survey Results

No burrowing owls or recent sign (i.e., pellets, feathers, castings, or whitewash) were observed within the BSA. The undeveloped portions of the BSA are unvegetated and/or vegetated with a variety of low-growing plant species that allow for line-of-sight observation favored by burrowing owls. However, the project footprint was determined to lacks suitable burrows (>4 inches in diameter) capable of providing roosting and nesting opportunities. However, a single burrowing owl was observed northeast on the northern portion of the BSA, outside of the BSA during the March 24, 2021 survey. Along the concrete v-ditch outside of the project footprint, but within the BSA several suitable burrows were observed.

4.3.1.2 Project Impacts

The proposed Project will generally follow existing roads and disturbed right-of-way, and heavily disturbed areas, with minimal direct impacts to surrounding areas. Although not anticipated, development of the Project has the potential to have indirect impacts to burrowing owl species during the avian breeding season February 1st to August 31st) season when individuals may be attempting to incubate eggs or raise young.

4.3.1.3 Avoidance and Minimization Efforts/Compensatory Mitigation

Within three (3) days prior to ground disturbance, the construction area and adjacent areas within 500 feet of the Project footprint, will be surveyed by an Acceptable Biologist for burrows that could be used by burrowing owl. If a suitable burrowing owl burrow is observed, the biologist will determine if the burrow has recently been used or if an owl is present in the burrow. If the burrow is determined to be occupied, the burrow will be flagged and a 200-foot buffer during the non-breeding season and a 500-foot buffer during the breeding season or a buffer to the edge of the property boundary if less than 500 feet, will be established around the burrow. The buffer will be staked and flagged. No construction activities will be permitted within the buffer until the young are no longer dependent on the burrow. In coordination with CDFW, the no work buffer can be reduced depending on the behavior of the burrowing owls, topography, existing vegetation, human development, and land uses in an area.

It is recommended that a biological monitor be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest becomes inactive under natural conditions, construction activities may resume within the buffer area.

If the burrow is unoccupied, the burrow will be made inaccessible to owls, and construction activities may proceed. If either a nesting or escape burrow is occupied, owls shall be relocated pursuant to accepted Wildlife Agency protocols. A burrow is assumed occupied if records indicate that, based on surveys conducted following protocol, at least one burrowing owl has been observed occupying a burrow on site during the past three years. If there are no records for the site, surveys must be conducted to determine, prior to construction, if burrowing owls are present. Determination of the appropriate method of relocation, such as eviction/passive relocation or active relocation, shall be based on the specific site conditions (e.g., distance to nearest suitable habitat and presence of burrows within that habitat) in coordination with the CDFW. Active relocation and eviction/passive relocation require the preservation and maintenance of suitable burrowing owl habitat determined through coordination with the CDFW.

In addition to a pre-construction clearance survey, a Worker Environmental Awareness Program (WEAP) shall be conducted prior to the start of construction, focusing on the avoidance and minimization of impacts to burrowing owl during construction.

With incorporation of the avoidance and minimization measures described above, including the pre-construction burrowing owl clearance survey, no compensatory mitigation will be required. However, if burrowing owls are detected within the propsoed limits of dusturbance during the pre-construction clearance survey and the survey reveals that the Project site and surrounding area support fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be relocated following accepted protocols in accordance with the CDFW Staff Report on Burrowing Owls.

5. Conclusions and Regulatory Determinations

5.1 Federal Endangered Species Act Consultation Summary

Besides the species list received from the USFWS, no verbal or written communication with the USFWS or the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) regarding the FESA has been initiated. A USFWS Species List was generated from the IPaC database. According to the USFWS IPaC Species List, only one (1) federally listed threatened or endangered plant and animal species were determined to have potential to occur in the general vicinity of the BSA. Refer to Appendix C, *Potentially Occurring Special-Status Biological Resources*, for a determination on all listed and non-listed species, as well as detailed habitat descriptions.

Based on the results of the habitat assessment and the proposed limits of disturbance, the Project was determined to have no effect on any federally listed species identified by the USFWS Species List, CNDDB, or CNPS. Additionally, the BSA is not located within federally designated Critical Habitat. Consultation with USFWS pursuant to the FESA will not be required.

5.2 Essential Fish Habitat Consultation Summary

Designated Essential Fish Habitat is not found within the BSA or immediate area. Therefore, Consultation with the NMFS will not be required.

5.3 Wetlands and Other Waters Coordination Summary

No jurisdictional drainage and/or wetland features were observed within the BSA during the field investigation that would fall under the regulatory authority of the Corps, Regional Board, or CDFW jurisdiction and regulatory approvals will not be required.Therefore, regulatory approvals from the Corps, Regional Board, and/or CDFW will not be required for implementation of the project.

5.4 Invasive Species

Noxious weed species include species designated as federal noxious weeds by USDA, species listed by the California Department of Food and Agriculture, and other exotic pest plants designated by the California Invasive Plant Council (Cal-IPC). Invasive plant species are abundant throughout much of the BSA. Some of the more commonly occurring exotic plants in the BSA include wild oat, ripgut brome, red brome, tumbleweed,

and filaree. Prior to implementation of the Project, all construction equipment will be inspected and cleaned prior to use in the Project footprint to minimize the importation of non-native plant material.

5.5 Other

Migratory Bird Treaty Act and California Fish and Game Code

Pursuant to the Migratory Bird Treaty Act and California Fish and Game Code (Sections 3503, 3511 and 3513), future construction activities and/or the removal of any trees, shrubs, or any other potential nesting habitat should be conducted outside the avian nesting season. The nesting season extends from February 1 through August 31, but can vary slightly from year to year based upon seasonal weather conditions. If construction or vegetation clearing activities occur during the avian nesting season a pre-construction nesting bird clearance survey will be required and should specifically focus on the presence/absence of burrowing owl, if determined to no longer occupy the BSA.

6. References

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7. Appendix

Appendix A: United States Fish and Wildlife Service Species List

Appendix B: Site Photographs

Appendix C: Potentially Occurring Special-Status Biological Resources

Appendix A United States Fish and Wildlife Service Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901
http://www.fws.gov/carlsbad/

In Reply Refer To:
Consultation Code: 08ECAR00-2021-SLI-1098
Event Code: 08ECAR00-2021-E-02452
Project Name: State Route 86 and Pitzer Road Improvements

June 02, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

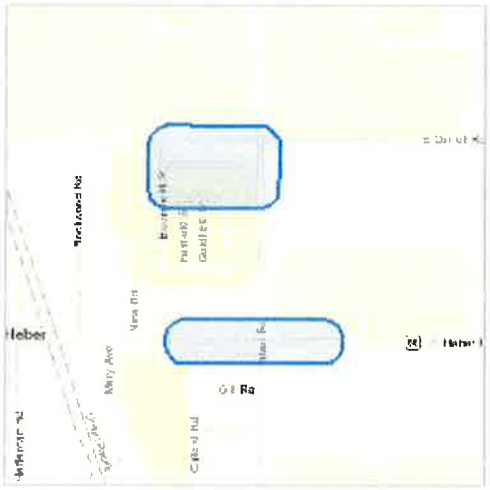
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Consultation Code: 08ECAR00-2021-SLI-1098
Event Code: 08ECAR00-2021-E-02452
Project Name: State Route 86 and Pitzer Road Improvements
Project Type: TRANSPORTATION
Project Description: The proposed Project includes a 320-unit affordable housing project on a 16-acre site approximately 0.4 mile north and west of the State Route 86/ Pitzer Road intersection. The original 290-unit housing project will be increased by 30 units. In addition, the State Route 86/Pitzer Road intersection is proposed to include a round-about intersection with improvements according along State Route 86 and Pitzer Road.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.73071085,-115.51762389999999,14z



Counties: Imperial County, California

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix B Site Photographs

Photograph 1: From the southeast corner of the intersection of Bloomfield Street and E. Correll Road (northwest corner of the residential footprint), looking south along the eastern boundary of the proposed residential portion of the project.

Photograph 2: From the southeast corner of the intersection of Bloomfield Street and E. Correll Road (northwest corner of the residential footprint), looking east along the northern boundary of the proposed residential portion of the project.

Photograph 3: From the southwest corner of the proposed residential portion of the project looking northeast.

Photograph 4: From the southwest corner of the intersection of Pitzer Road and E. Correll Road (northeast corner of the residential footprint), looking south along the western boundary of the proposed residential portion of the project.

Photograph 5: From the southwest corner of the intersection of Pitzer Road and E. Correll Road (northeast corner of the residential footprint), looking west along the northern boundary of the proposed residential portion of the project.

Photograph 6: From northwest boundary of the BSA, north of the proposed residential portion of the project and E. Correll Road, looking east at the agricultural concrete v-ditch and agricultural fields.

Photograph 7: From northeast boundary of the BSA, east of the proposed residential portion of the project and Pitzer Road, looking south at the agricultural concrete v-ditch and agricultural fields east of the residential portion of the project.

Photograph 8: From eastern boundary of the BSA, east of the proposed residential portion of the project and Pitzer Road, looking west towards E. Correll Road.

Photograph 9: From the northwest corner of the intersection of Pitzer Road and State Route 86, looking west along the northern boundary of State Route 86 where improvements are proposed to occur.

Photograph 10: From the northeast corner of the intersection of Pitzer Road and State Route 86, looking east along the northern boundary of State Route 86 where improvements are proposed to occur.

Photograph 11: Looking east, at the eastern boundary of BSA.

Photograph 12: Looking east towards the intersection of Pitzer Road and State Route 86, approximately 1,000 feet west of the intersection.

Photograph 13: Looking south along Pitzer Road towards the intersection of Pitzer Road and State Route 86, approximately 1,000 feet north of the intersection.

Photograph 14: Looking east along Desert Sunrise Road, within the southern boundary of the southern of the BSA looking east.

Appendix C Potentially Occurring Special-Status Biological Resources

Potentially Occurring Sensitive Biological Resources

Scientific Name Common Name	Status		Habitat	Observed On-site	Potential to Occur
SPECIAL-STATUS WILDLIFE SPECIES					
Athene cunicularia burrowing owl	Fed: CA:	None SSC	Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Dependent upon fossorial mammals for burrows, most notably ground squirrels.	No	**High.** The BSA supports line-of-sight opportunities favored by burrowing owls; however, no suitable burrows (>4 inches) are present within the proposed limits of disturbance. Suitable habitat is present within the BSA along canals to the north and east. A burrowing owl was observed northeast of the northern BSA during the field investigation.
Calypte costae Costa's hummingbird	Fed: CA:	None None	Desert and semi-desert, arid brushy foothills and chaparral. A desert hummingbird that breeds in the Sonoran and Mojave Deserts. Departs desert heat moving into chaparral, scrub, and woodland habitats.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Charadrius montanus mountain plover	Fed: CA:	None SSC	Found in short grasslands, freshly-plowed fields, newly-sprouting grain fields, and sometimes in sod farms. Prefers short vegetation or bare ground with flat topography, particularly grazed areas or areas with fossorial rodents.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Eumops perotis californicus western mastiff bat	Fed: CA:	None SSC	Primarily a cliff-dwelling species, roost generally under exfoliating rock slabs. Roosts are generally high above the ground, usually allowing a clear vertical drop of at least 3 meters below the entrance for flight. In California, it is most frequently encountered in broad open areas. Its foraging habitat includes dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Falco columbarius merlin	Fed: CA:	None WL	Nest in forested openings, edges, and along rivers across northern North America. Found in open forests, grasslands, and especially coastal areas with flocks of small songbirds or shorebirds.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.

Scientific Name Common Name	**Status**		**Habitat**	**Observed On-site**	**Potential to Occur**
Lanius ludovicianus loggerhead shrike	Fed: CA:	None SSC	Often found in broken woodlands, shrublands, and other habitats. Prefers open country with scattered perches for hunting and fairly dense brush for nesting.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Lasiurus xanthinus western yellow bat	Fed: CA:	None SSC	Occurs in valley/foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts under palm trees and feeds in, and near, palm oases and riparian habitats.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Lithobates yavapaiensis Lowland leopard frog	Fed: CA:	None SSC	Occurs in temperate forests, rivers, intermittent rivers, freshwater lakes, and freshwater marshes.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Melanerpes uropygialis gila woodpecker	Fed: CA:	None **END**	Typically found in low desert scrub habitat, arroyos, and small towns in the Sonoran Desert. Nests in holes bored into saguaro cactus and mesquite trees.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Neotoma albigula venusta Colorado Valley woodrat	Fed: CA:	None None	Occupies a variety of plant communities below 9,200 feet; most common in Sonoran and Chihuahuan desert grassland, scrub, and shrubland. Generally associated with creosote, mesquite, prickly pear, cholla, catclaw acacia, and paloverde.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Numenius americanus long-billed curlew	Fed: CA:	None WL	Preferred winter habitats include large coastal estuaries, upland herbaceous areas, and croplands. On estuaries, feeding occurs mostly on intertidal mudflats.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Numenius phaeopus whimbrel	Fed: CA:	None None	Forages primarily in coastal mudflats, marshes, and shorelines, in addition to heavily irrigated agricultural fields such as rice paddies. Nests on scrapes in the Arctic.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: CA:	None SSC	Often found in pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Phrynosoma mcallii flat-tailed horned lizard	Fed: CA:	None SSC	Typical habitat is sandy desert hardpan or gravel flats with scattered sparse vegetation of low species diversity. Most common in areas with high density of harvester ants and fine windblown sand, but rarely occurs on dunes.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Pyrocephalus rubinus vermilion flycatcher	Fed: CA:	None SSC	Occupies desert riparian habitat, particularly cottonwoods, willows, mesquite, and other large desert riparian trees, in habitat adjacent to irrigated fields, irrigation ditches, pastures, and other open, mesic areas where it can forage.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Selasphorus rufus rufous hummingbird	Fed: CA:	None None	During breeding, they are found in forests, on seed-tree harvest units, riparian shrub, and spruce-fir habitats. During the winter, it migrates to lowland stream bottoms, foothill brush land, seacoast and high mountain meadows.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.

Scientific Name Common Name	Status		Habitat	Observed On-site	Potential to Occur
Setophaga petechia yellow warbler	Fed: CA:	None SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes and the eastern side of the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties. Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near stream courses.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Taxidea taxus American badger	Fed: CA:	None SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
SPECIAL-STATUS PLANT SPECIES					
Abronia villosa* var. *aurita chaparral sand-verbena	Fed: CA: CNPS:	None None 1B.1	Grows in sandy soils in coastal sage scrub and in chaparral habitats. Grows in elevation from 262 to 5,249 feet. Blooming period ranges from January to September.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA. The project site occurs outside of the known elevation range for this species.
Amaranthus watsonii Watson's amaranth	Fed: CA: CNPS:	None None 4.3	Grows in Mojavean desert scrub and Sonoran desert scrub habitats. Found at elevations ranging from 66 to 5,577 feet. Blooming period is from April to September.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA. The project site occurs outside of the known elevation range for this species.
Astragalus sabulonum gravel milk-vetch	Fed: CA: CNPS:	None None 2B.2	Occurs in sandy and gravelly soils in flats, washes, and roadsides in desert dunes and Mojavean and Sonoran desert scrub. Found at elevations ranging from 98 to 2,936 feet. Blooming period is from February to May.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA. The project site occurs outside of the known elevation range for this species.
Euphorbia abramsiana Abrams' spurge	Fed: CA: CNPS:	None None 2B.2	Grows in sandy soils within Mojavean desert scrub and Sonoran desert scrub. Found at elevations ranging from -16 to 4,298 feet. Blooming period is typically from September to November and can begin as early as August.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.

Scientific Name Common Name	**Status**	**Habitat**	**Observed On-site**	**Potential to Occur**
Imperata brevifolia California satintail	Fed: None CA: None CNPS: 2B.1	Grows in mesic soils within coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and riparian scrub habitats. found at elevations ranging from 0 to 3,986 feet. Blooming period is from September to May.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Johnstonella costata ribbed cryptantha	Fed: None CA: None CNPS: 4.3	Occurs in sandy soils within desert dunes and Mojavean and Sonoran desert scrub. Found at elevations ranging from -197 to 1,640 feet. Blooming period is from February to May.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.
Johnstonella holoptera winged cryptantha	Fed: None CA: None CNPS: 4.3	Occurs in Mojavean desert scrub and Sonoran desert scrub. Found at elevations ranging from 328 to 5,544 feet. Blooming period ranges from March to April.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA. The project site occurs outside of the known elevation range for this species.
Mentzelia hirsutissima hairy stickleaf	Fed: None CA: None CNPS: 2B.3	Grows within Sonoran desert scrub (rocky) habitats. Found at elevations ranging from 0 to 2,297 feet. Blooming period is from March to May.	No	**Presumed Absent.** There is no suitable habitat within or adjacent to the BSA.

U.S. Fish and Wildlife Service (USFWS) - Federal
END- Federal Endangered
THR- Federal Threatened

California Department of Fish and Wildlife (CDFW) - California
END- California Endangered
THR- California Threatened
FP- California Fully Protected
SSC- Species of Special Concern
WL- Watch List

California Native Plant Society (CNPS)
California Rare Plant Rank
1B Plants Rare, Threatened, or Endangered in California and Elsewhere
3 Plants About Which More Information is Needed – A Review List
4 Plants of Limited Distribution – A Watch List

Threat Ranks
0.1- Seriously threatened in California
0.2- Moderately threatened in California
0.3- Not very threatened in California

Attachment "C"

March 19, 2021
Anza Project No. 21-0003

Ryan Birdseye, Principal
Birdseye Planning Group
1354 York Drive
Vista, CA 92084
Via email: ryan@birdseyeplanninggroup.com

Subject: Cultural Resources Study for the Heber Meadows Subdivision Project, Community of Heber, Imperial County, California

Dear Mr. Birdseye,

Anza Resources Consultants (Anza) was retained by Birdseye Planning Group (BPG) to prepare a cultural resources study for the Heber Meadows Subdivision Project (project) located at 16.22 acres at 185 Willowbrook Way, Heber, CA 92249. Anza understands that the project seeks federal funding assistance through the U.S. Department of Agriculture's 514 Program and, therefore, qualifies as an undertaking subject to the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act.

Project/Undertaking Description

The proposed undertaking would subdivide 16.22 acres into five parcels and a lettered lot for access. Proposed Parcel 1, occupying 2.96 acres in the southwest corner of the project site, would be developed into 64 affordable housing units designated for farmworkers and families. The project site is located within the northeast quarter of Section 28, Township 16 South, Range 14 East, San Bernardino Base and Meridian (Figure 1). The project site can also be described as occupying Assessor's Parcel Number (APN) 054-601-016-000). The entire 16.22-acre project site is the direct Area of Potential Effects (APE) for the proposed undertaking and the indirect APE extends one parcel out in each direction. The maximum depth of the APE is approximately four feet below current grade. The entire site will be over-excavated and recompacted. Utility trenches are estimated to be excavated as much as 36 inches below finished grade.

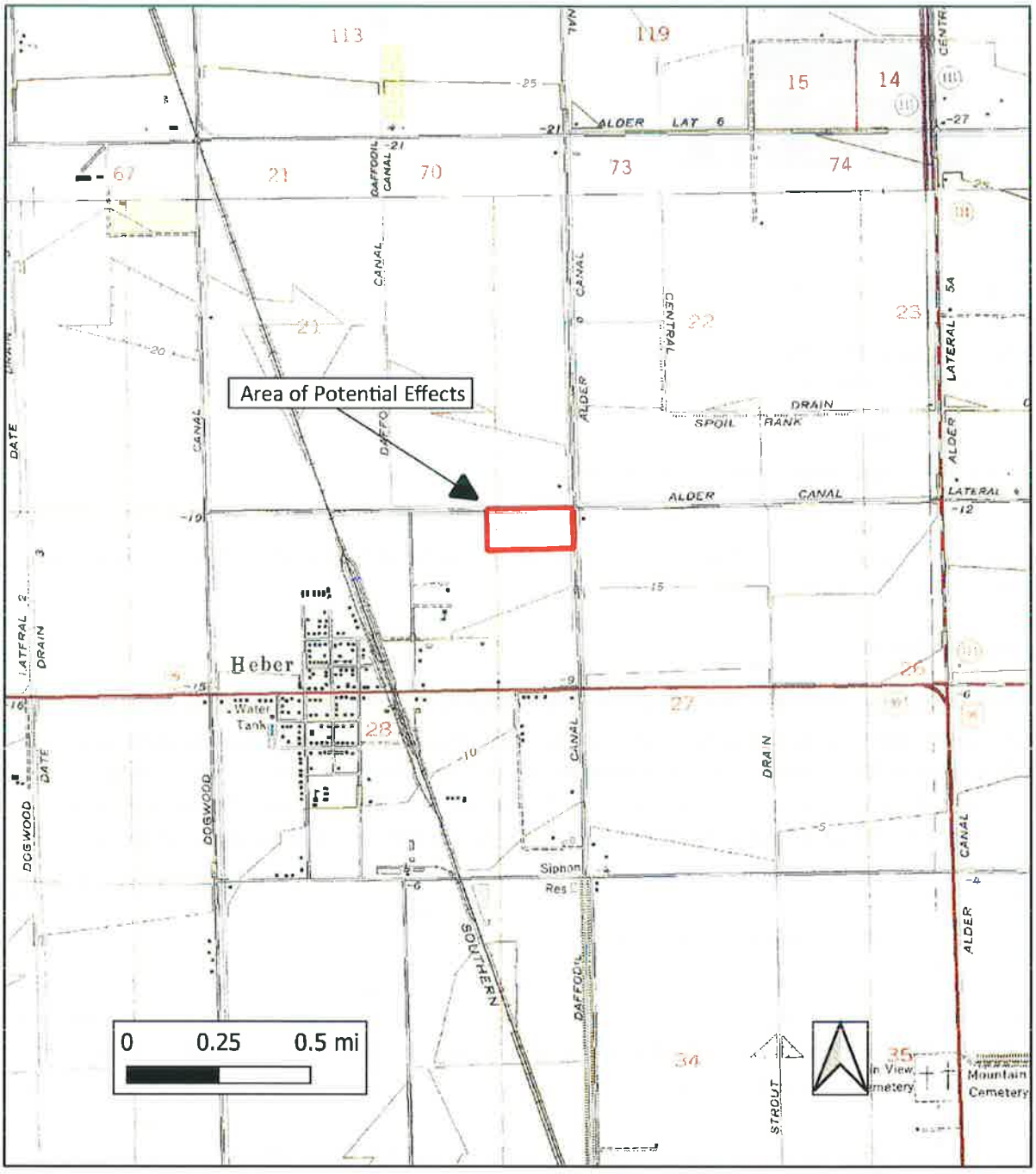


Figure 1. Area of Potential Effects USGS *Heber, CA* 7.5-minute quadrangle

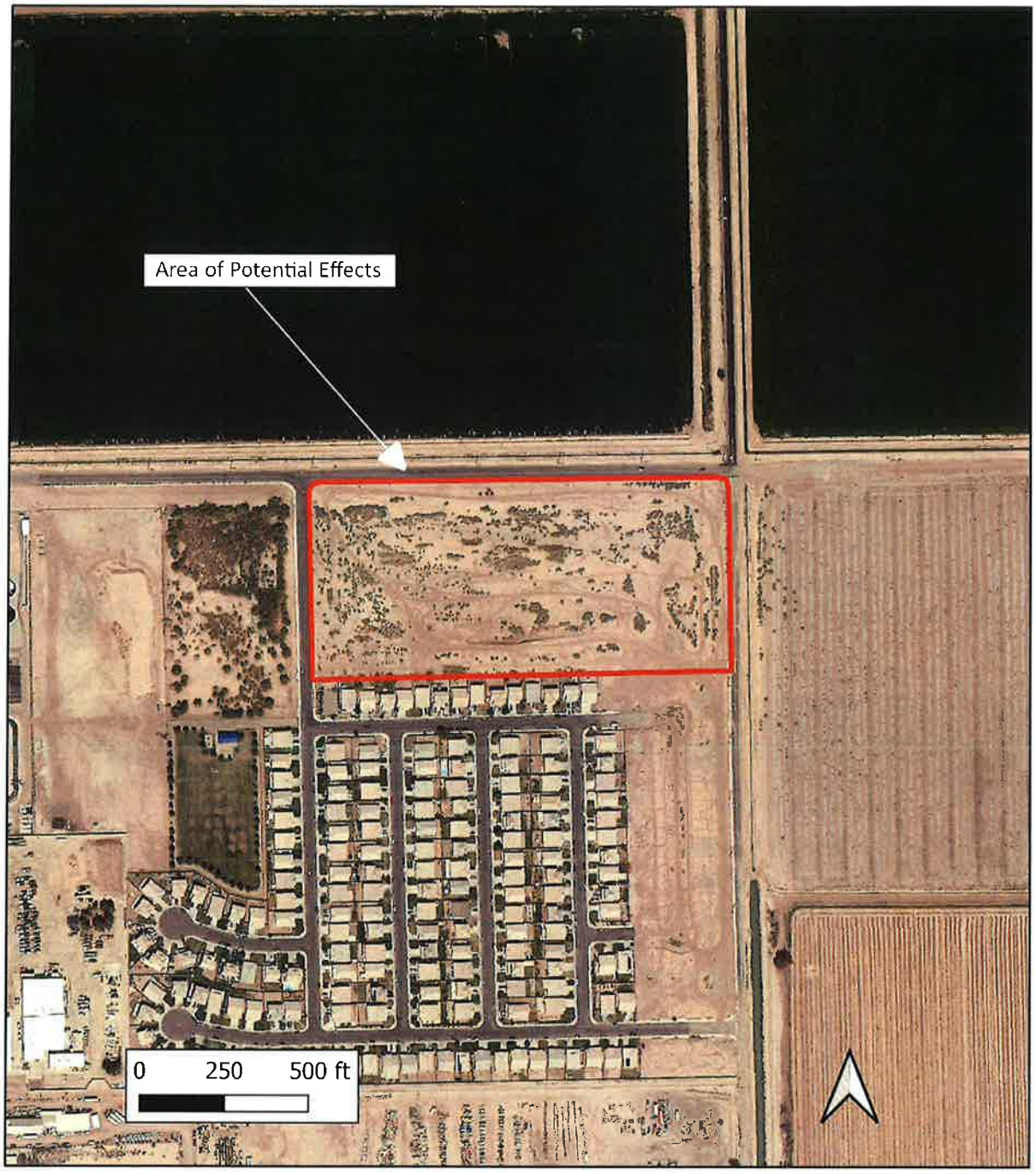


Figure 2. Aerial View of Project Site Source: Google Satellite Image

California Historical Resource Information System

Anza requested a search of cultural resource records housed at the California Historical Resources Information System (CHRIS), South Coastal Information Center (SCIC), located at San Diego State University. The search was conducted on February 25, 2021, to identify all previous cultural resources work and previously recorded cultural resources within a one-mile radius of the project site (Attachment A). The CHRIS search included a review of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Points of Historical Interest list, California Historical Landmarks list, Archaeological Determinations of Eligibility list, and California State Historic Resources Inventory list. The records search also included a review of all available historic United States Geological Survey (USGS) 7.5-, 15-, and 30-minute quadrangle maps.

Previous Studies

The SCIC records search identified 11 cultural resources studies that were conducted within a one-mile radius of the project APE, four of which included the project APE (Table 1). None of the four previous studies that included the APE (IM-00063, -00066, -00272, and -00368) included archaeological survey to current professional standards and none identified cultural resources within or adjacent to the APE.

Table 1. Previous Cultural Resource Studies within a One-Mile Radius of the Project APE

Report Number	Author	Year	Title	Proximity to Project APE
IM-00063	Von Werlhof, Jay and Shrilee Von Werlhof	1976	Archaeological Examination of a Proposed Geothermal Testing Site Near Heber, California	**Includes APE**
IM-00066	Von Werlhof, Jay and Shrilee Von Werlhof	1976	Archaeological Record Search of the Heber, California, Region	**Includes APE**
IM-00123	VTN Consolidated, Inc.	1977	Draft Environmental Impact Report for the Heber Geothermal Demonstration Project	Approximately 0.6 mile east
IM-00192	VTN Consolidated, Inc.	1979	Draft Master Environmental Impact Report for a 500-Megawatt Geothermal Development at Heber, Imperial County, California	Adjacent to east
IM-00272	Sanchez, Miguel	1982	Draft Environmental Impact Report - Current Land Use Plan, Heber Planning Unit	**Includes APE**
IM-00368	Imperial County Planning Department	1987	Chevron Geothermal Company of California Supplemental Project Information for the Auxiliary Production Facility Heber Geothermal Unit, Imperial County	**Includes APE**
IM-00441	ENSR Consulting and Engineering	1990	Environmental Assessment/Initial Study for the Placement of Fiber Optic Facilities Between Salton Microwave Station and Calexico California	Approximately 0.8 mile west

Report Number	Author	Year	Title	Proximity to Project APE
IM-01080	Von Werlhof, Jay	1999	Archaeological Examinations of the Heber Facilities Sewer and Water Improvements Project	Approximately 0.9 mile southwest
IM-01095	Garnsey, Michael	2007	Cultural Resources Study for the Proposed Mosaic Project, Imperial County, California	Approximately 0.9 mile southwest
IM-01239	Tang, Bai and Michael Hogan	2007	Historical/Archaeological Resources Survey Report - World Meridian Project, Assessor's Parcel No. 054-024-02, near the Community of Heber, Imperial County, California	Approximately 0.24 mile southeast
IM-01306	Wirth Associates, Inc	1980	APS/SDG&E Interconnection Project Environmental Study Phase II Corridor Studies - Native American Cultural Resources Appendices	Approximately 0.7 mile north

Source: SCIC, March 2021

Previously Recorded Resources

The SCIC records search identified two cultural resources previously recorded within a one-mile radius of the project APE (Table 2). Neither of these resources is within or adjacent to the project APE. Both resources are historic built environment: the Niland to Calexico Railroad and the Alder Canal. Neither resource appears to have been evaluated for NRHP or CRHR listing.

Table 2. Previously Recorded Cultural Resources within One-Mile of the Project APE

Primary Number	Trinomial	Description	NRHP/CRHR Eligibility Status	Recorded Year (By Whom)	Relationship to Project APE
P-13-008682	CA-IMP-008166	Niland to Calexico Railroad	Insufficient information	2011 (C. Ehringer); 2009 (IVC Museum); 2005 (Craft and Wise); 2003 (K. Collins)	Approximately 0.75 mile west
P-13-009015		Alder Canal	Insufficient information	2009 (C. Dolan and J. Toenjes, EDAW, Inc.)	Approximately 0.1 mile northeast

Source: SCIC, March 2021

Final Program EIR for the County of Imperial General Plan

In Section III, F (Environmental Analysis, Cultural Resources) this EIR includes a discussion and figure on the distribution and sensitivity of prehistoric archaeological resources in Imperial County (County of Imperial 1993: III-144 through III-147). This section states "...the intensive use of Imperial Valley for irrigation agriculture since the beginning of this [twentieth] century has impacted any resources that may have existed on land that is now farmland or under the Salton Sea." The Sensitivity Map for Cultural Resources shows the project APE within an area labeled "zero to rare."

Historic Period Maps

Anza reviewed historic period topographical maps online to confirm the APE's land use history. Maps reviewed in include the 2012 U.S. Geological Survey (USGS) *Heber, California* (1:24,000), which showed nothing in the project APE; 1957 U.S. Geological Survey (USGS) *Heber, California* (1:24,000), which showed nothing in the project APE; 1943 *Heber, California* (1:62,500), which showed nothing in the project APE; 1940 *Heber, California* (1:62,500), which showed nothing in the project APE; and 1915 *El Centro, California* (1:125,000), which showed nothing in the project APE.

Native American Scoping

Anza requested a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) on February 23, 2021. The NAHC sent a response on March 9, 2021, stating that a search of the SLF was completed with positive results (i.e., sacred lands or resources important to Native Americans are recorded within the vicinity of the project APE; Attachment B). The letter recommended that Anza contact the Torres-Martinez Desert Cahuilla Indians and the Ewiiaapaayp Band of Kumeyaay Indians for more information.

On March 9, 2021, Anza mailed letters to the NAHC-listed contacts describing the project and asking if they had knowledge regarding cultural resources of Native American origin within or near the APE (Attachment B). Anza also emailed the letter to Cultural Resources Director Michael Mirelez of the Torres-Martinez Desert Cahuilla Indians and Chairperson Robert Pinto of the Ewiiaapaayp Band of Kumeyaay Indians on March 9, 2021, to encourage dialogue.

On March 17, 2021, Quechan Indian Tribe Historic Preservation Officer H. Jill McCormick responding via email stating that the tribe had no comments regarding the project.

On March 17, 2021, Anza sent emails to remaining contacts with copies of the letters attached and providing an additional opportunity to comment or ask questions regarding the proposed undertaking.

No responses have been received as of March 19, 2021. All Native American scoping correspondence is presented in Attachment B.

Pedestrian Survey

On March 10, 2021, Anza Principal and Senior Cultural Resources Specialist Kevin Hunt conducted a pedestrian survey of the project APE. Transects were spaced 10 meters apart and oriented east-west. Mr. Hunt examined all areas of exposed ground surface for prehistoric artifacts (e.g., chipped stone tools and production debris, stone milling tools, ceramics), historic debris (e.g., metal, glass, ceramics), or soil discoloration that might indicate the presence of a cultural midden. Mr. Hunt recorded the characteristics of the project APE and survey conditions using a notepad and digital camera. Copies of the field notes and digital photographs are digitally stored online.

The project APE is vacant, has been brushed in the past, and appears to have been graded in the past (Photographs 1-4). There are numerous piles of fill dirt, construction debris, and modern trash within

the APE (Photographs 1-4). A large fill pad, approximately six feet tall and likely from heavy equipment such as a belly scraper, is present along the central portion of the southern edge of the project site (center of Photograph 4). Vegetation within the APE is primarily tumbleweed. Sediments observed were sandy silt, but some sand, angular gravel, and rounded cobbles were also present. No archaeological, historic built environment, or tribal cultural resources were identified within the project's direct APE during the pedestrian survey.

To the north of the APE across East Correll Road is an agricultural field. To the east across Pitzer Road is an agricultural field. To the south are modern single-family residences and open field in the southeast corner. To the west across Bloomfield Street is a vacant lower elevation lot, possibly a stormwater catchment basin. No historic properties were present within the project's indirect APE.

Photograph 1. View of project APE from northwest corner, facing southeast.

Photograph 2. View from northeast corner of APE, facing southwest.

Photograph 3. View from southwest corner of APE, facing northeast.

Photograph 4. View of APE from southeast corner, facing west.

Management Recommendations

The cultural records search revealed no archaeological, tribal cultural, or historic built environment resources within or adjacent to the project APE. The Sacred Lands File search results indicated that resources important to Native Americans are present in the vicinity of the APE; however, Native American scoping revealed no resources within or near the APE that could be affected by the proposed undertaking. No archaeological resources were identified within or near the APE during the study and the project APE is not considered sensitive for buried archaeological resources.

Anza recommends a finding of **no effects to historic properties under NEPA**. Although the current project is unlikely to encounter previously unidentified cultural resources or human remains, the recommendations below are provided in the event of unanticipated discoveries.

Unanticipated Discovery of Cultural Resources

If previously unidentified cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards for prehistoric or historic archaeology (National Park Service 1997), as appropriate, must be contacted immediately to evaluate the find. If the discovery proves to be significant under Section 106, additional work such as data recovery excavation may be warranted to avoid significant impacts. In the event that an identified cultural resource is of Native

American origin, the qualified archaeologist will consult with the project owner and the USDA to implement Native American consultation procedures.

Unanticipated Discovery of Human Remains

If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Please do not hesitate to contact Anza Resource Consultants if you have any questions regarding these findings or recommendations.

ANZA RESOURCE CONSULTANTS

Kevin Hunt
Senior Cultural Resources Specialist/Principal

Katherine Collins, MA, RPA
Principal Investigator, Cultural Resources

Anza Resource Consultants
603 Seagaze Drive, #1018
Oceanside, CA 92054

References:

County of Imperial
1993 Final Program EIR for the County of Imperial General Plan, Environmental Analysis. Electronic document accessed March 15, 2021, at: d-environmental-analysis.pdf (icpds.com).

National Park Service
1997 The Secretary of the Interior's Historic Preservation Professional Qualification Standards. Electronic document accessed March 11, 2021. Available at: https://www.govinfo.gov/content/pkg/FR-1997-06-20/pdf/97-16168.pdf.

Attachment A: Records Search Summary
Attachment B: Native American Scoping

Attachment A:
Records Search Summary

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
nick@scic.org

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Company: Anza Resource Consultants

Company Representative: Kevin Hunt

Date Processed: 2/25/2021

Project Identification: Heber Meadows Subdivision and SR 86 and Pitzer Rd Intersection

Search Radius: 1 mile

Historical Resources: JL

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: JL

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: JL

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: N/A

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of SHRC Approved CHRIS IC Records Search Elements	
RSID:	2851
RUSH:	no
Hours:	1.5
Spatial Features:	25
Address-Mapped Shapes:	no
Digital Database Records:	32
Quads:	1
Aerial Photos:	0
PDFs:	Yes
PDF Pages:	1418

This is not an invoice. Please pay from the monthly billing statement

Attachment B:
Native American Scoping

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission

1550 Harbor Blvd, Suite 100 West Sacramento, CA 95691

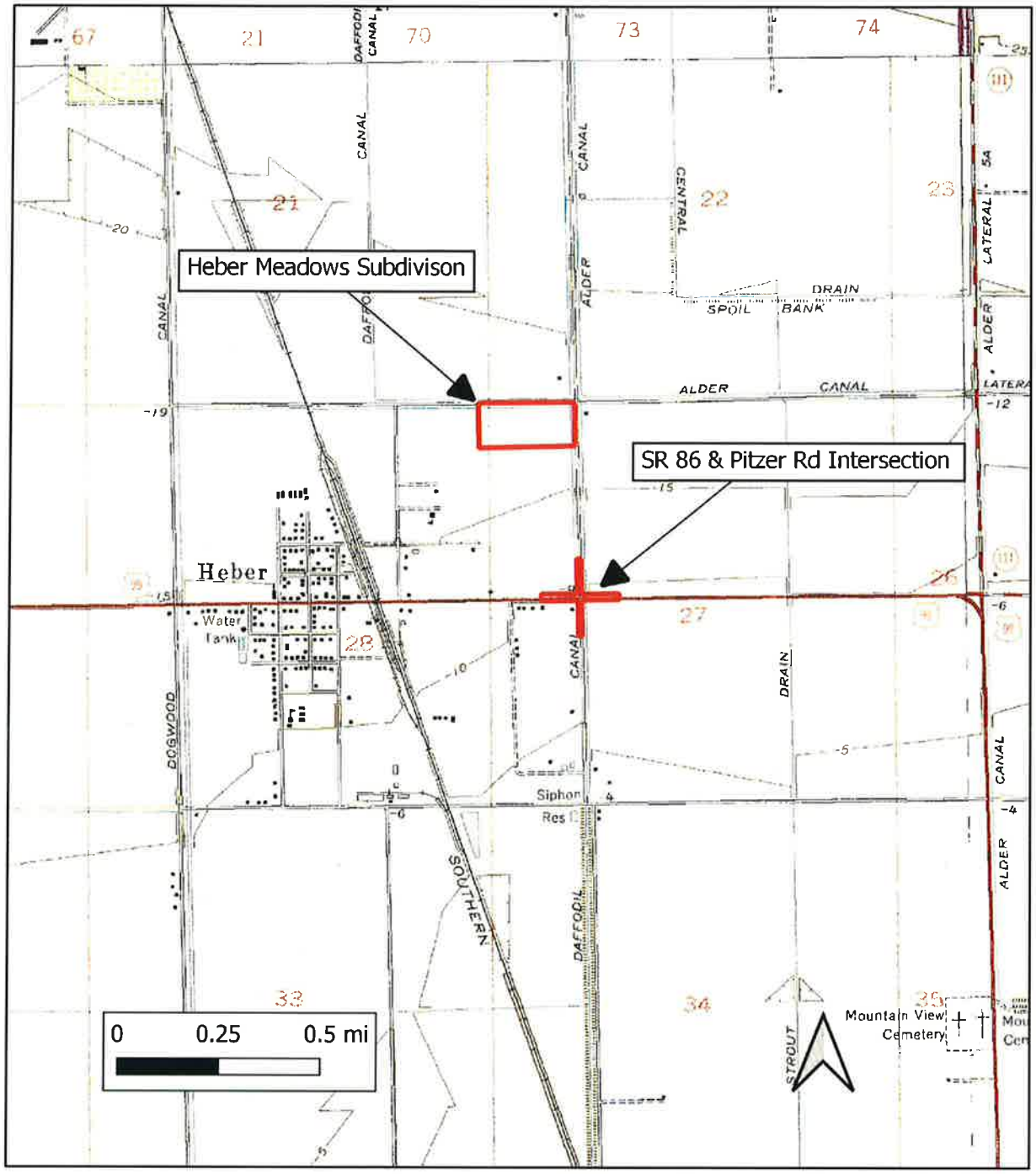
916-373-3710 916-373-5471 – Fax nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project
County: Imperial
USGS Quadrangle Name: Heber, CA
Township: 16S Range: 14E Section(s): 27 and 28
Company/Firm/Agency: Anza Resource Consultants
Street Address: 603 Seagaze Dr. #1018
City: Oceanside Zip: 92054
Phone: 760-207-9736
Fax: N/A
Email: kevin@anzaresourceconsultants.com
Date: 2/23/2021

Project Description:

The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to CEQA and the County of Imperial is the lead CEQA agency.



Heber, CA

Project Location Map

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
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Luiseño

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Karuk

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William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

March 9, 2021

Kevin Hunt
Anza Resource Consultants

Via Email to: kevin@anzaresourceconsultants.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Heber Meadows Subdivision and SR 86 Pitzer Rd Intersection Improvement Project, Imperial County

Dear Mr. Hunt:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was positive. Please contact the Ewiiaapaayp Band of Kumeyaay Indians and the Torres-Martinez Desert Cahuilla Indians on the attached list for more information.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Imperial County
3/9/2021

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Diegueno
Pine Valley, CA, 91962 — Kwaaymii
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County.

Native American Heritage Commission
Tribal Consultation List
Imperial County
3/9/2021

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Thomas Tortez, Chairperson
P.O. Box 1160 — Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
tmchair@torresmartinez.org

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

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This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County.

March 9, 2021

Barona Group of the CapitanGrande
Edwin Romero, Chairperson
1095 Barona Road
Lakeside, CA, 92040

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Romero:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

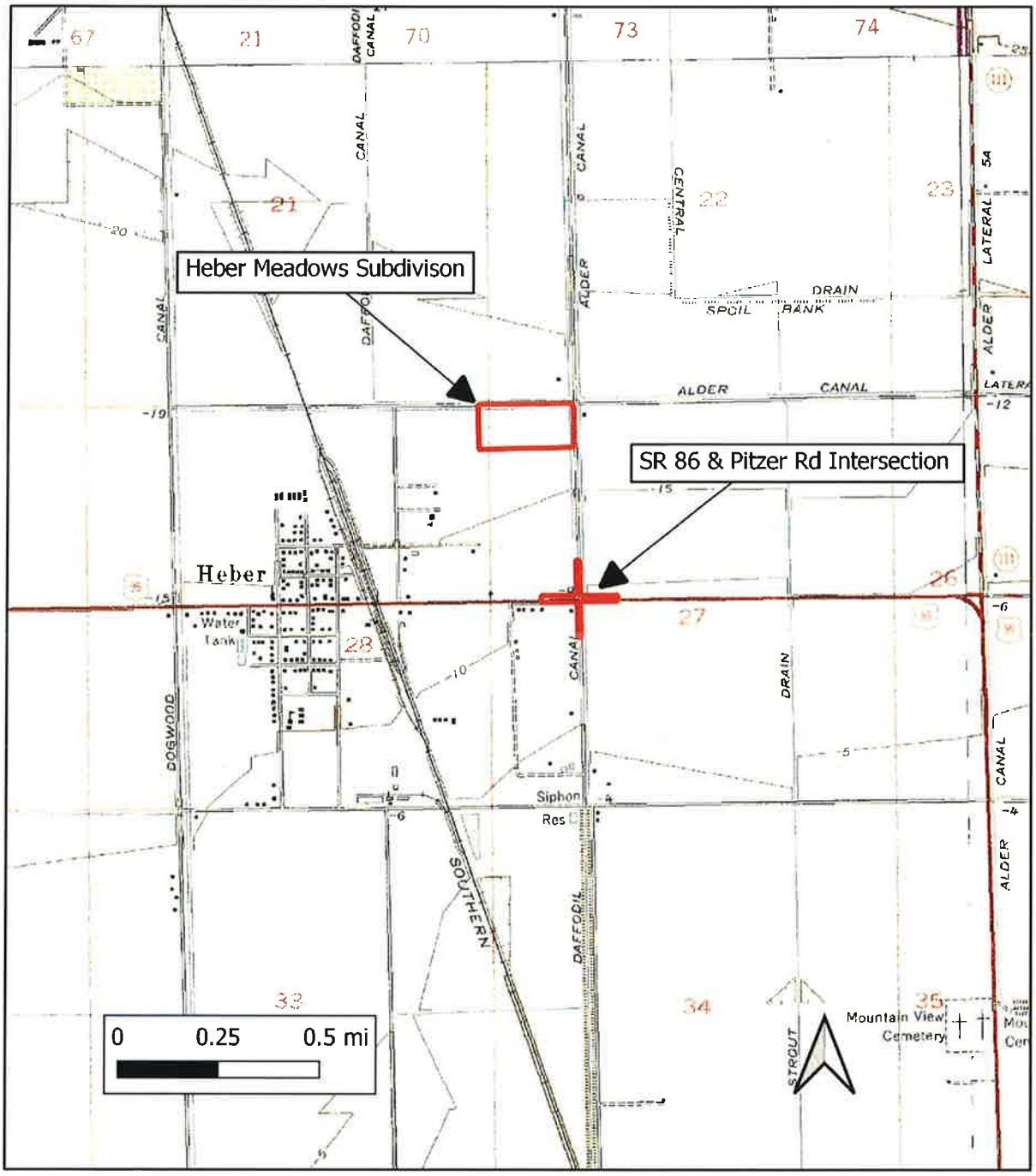
As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2021

Manzanita Band of Kumeyaay Indians
Angela Elliott Santos, Chairperson
PO Box 1302
Boulevard, CA 91905-1302

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Santos:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Oceanside, CA 92054

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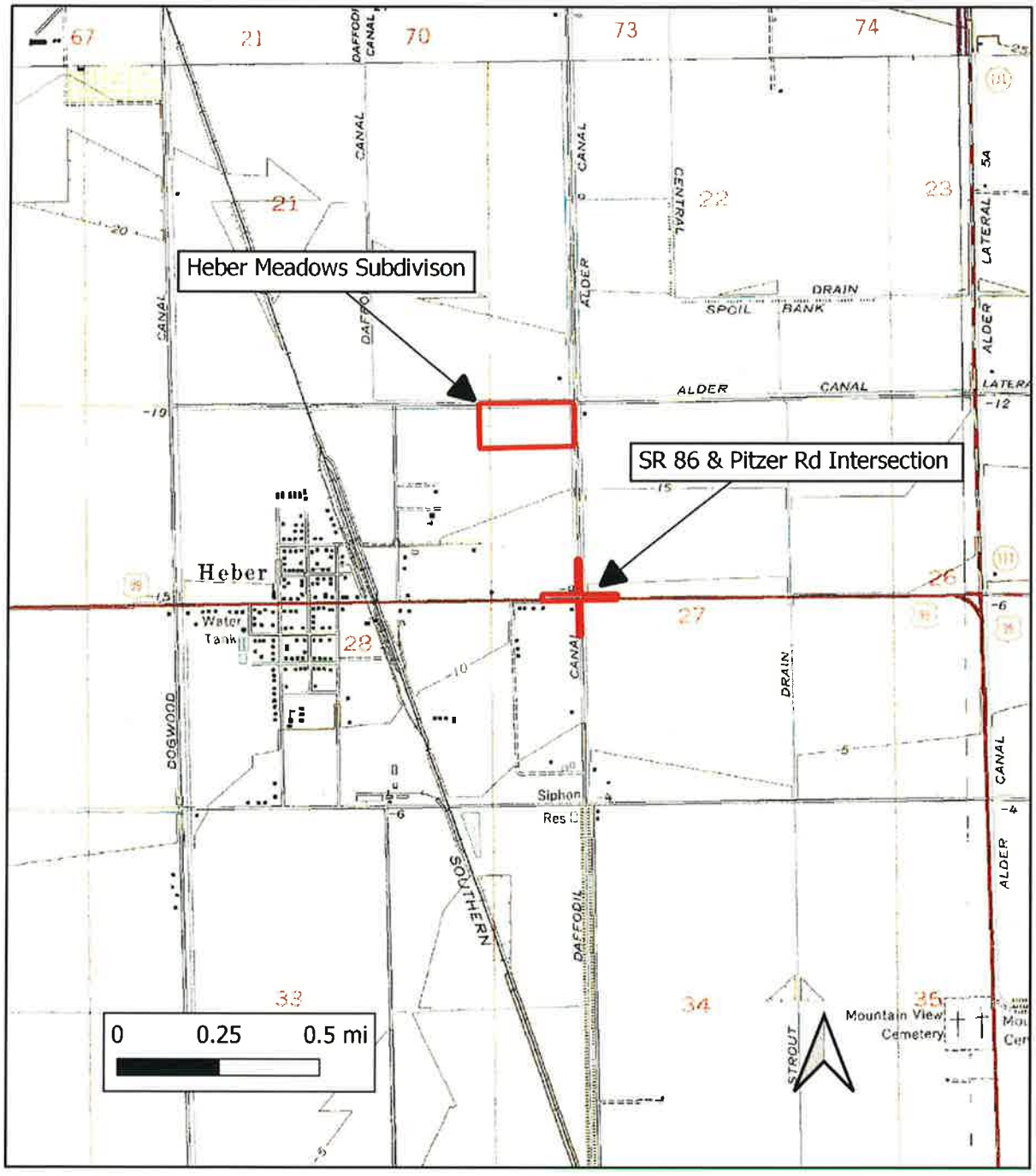

Project Location Map *Heber, CA*

March 9, 2021

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1
Campo, CA, 91906

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Goff:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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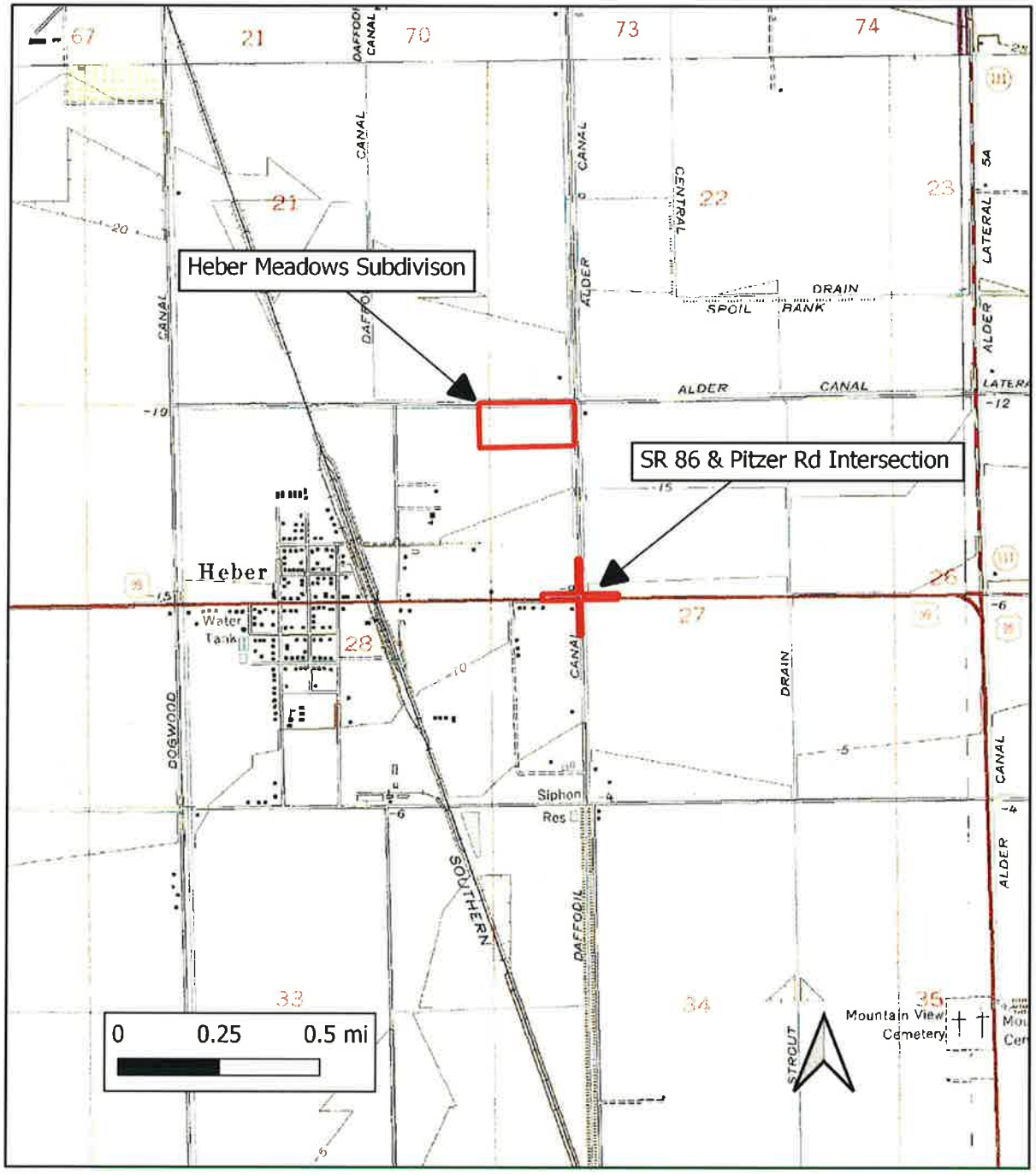
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

March 9, 2021

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
PO Box 365
Valley Center, CA 92082-0365

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Lawson:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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603 Seagaze Dr. #1018
Oceanside, CA 92054

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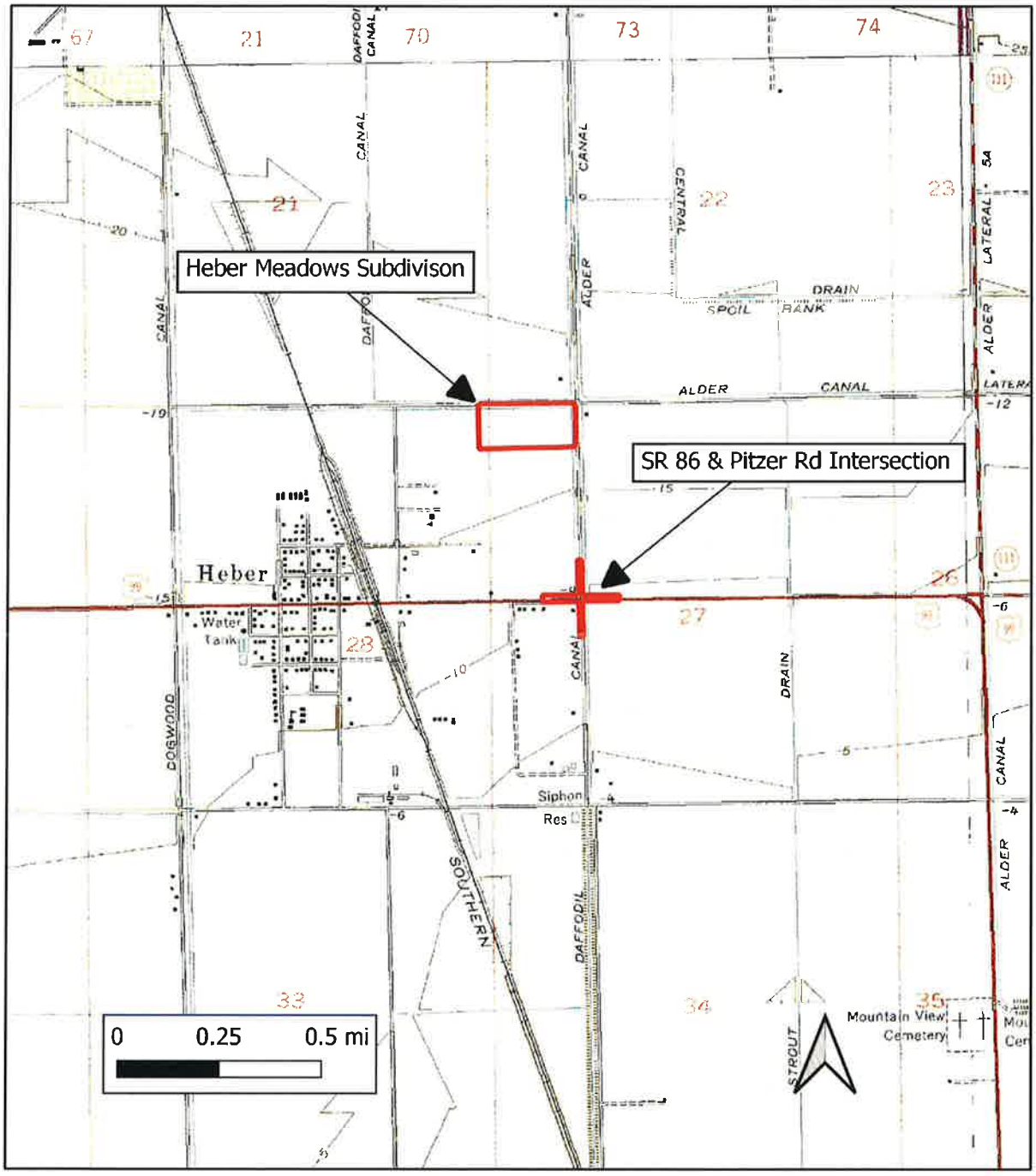

Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2020

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road
Alpine, CA, 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Vice Chairperson Garcia:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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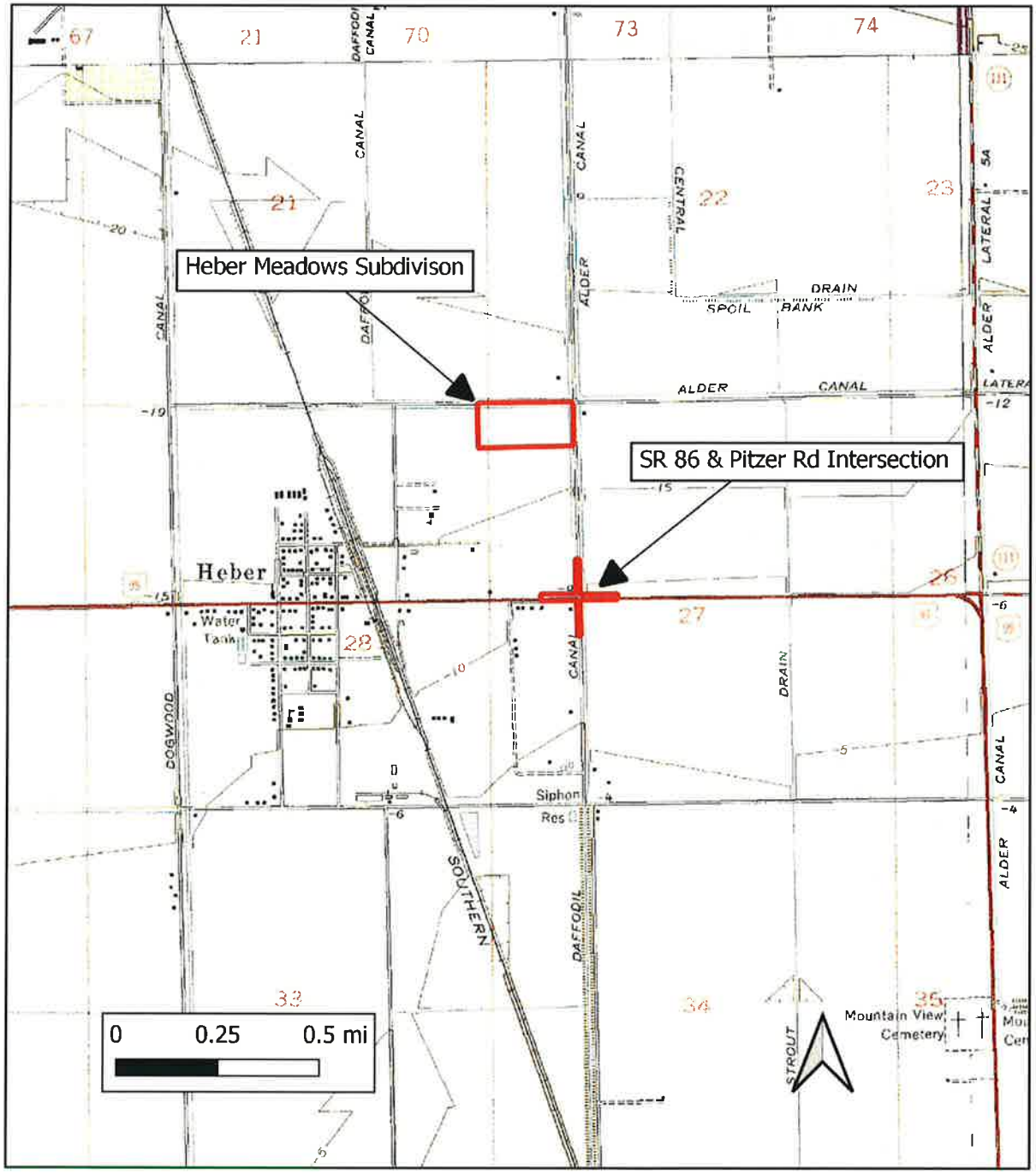
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

RESOURCE CONSULTANTS

March 9, 2021

Ewiiaapaayp Band of Kumeyaay Indians, California
Robert Pinto, Chairperson
4054 Willows Road
Alpine, CA 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Pinto:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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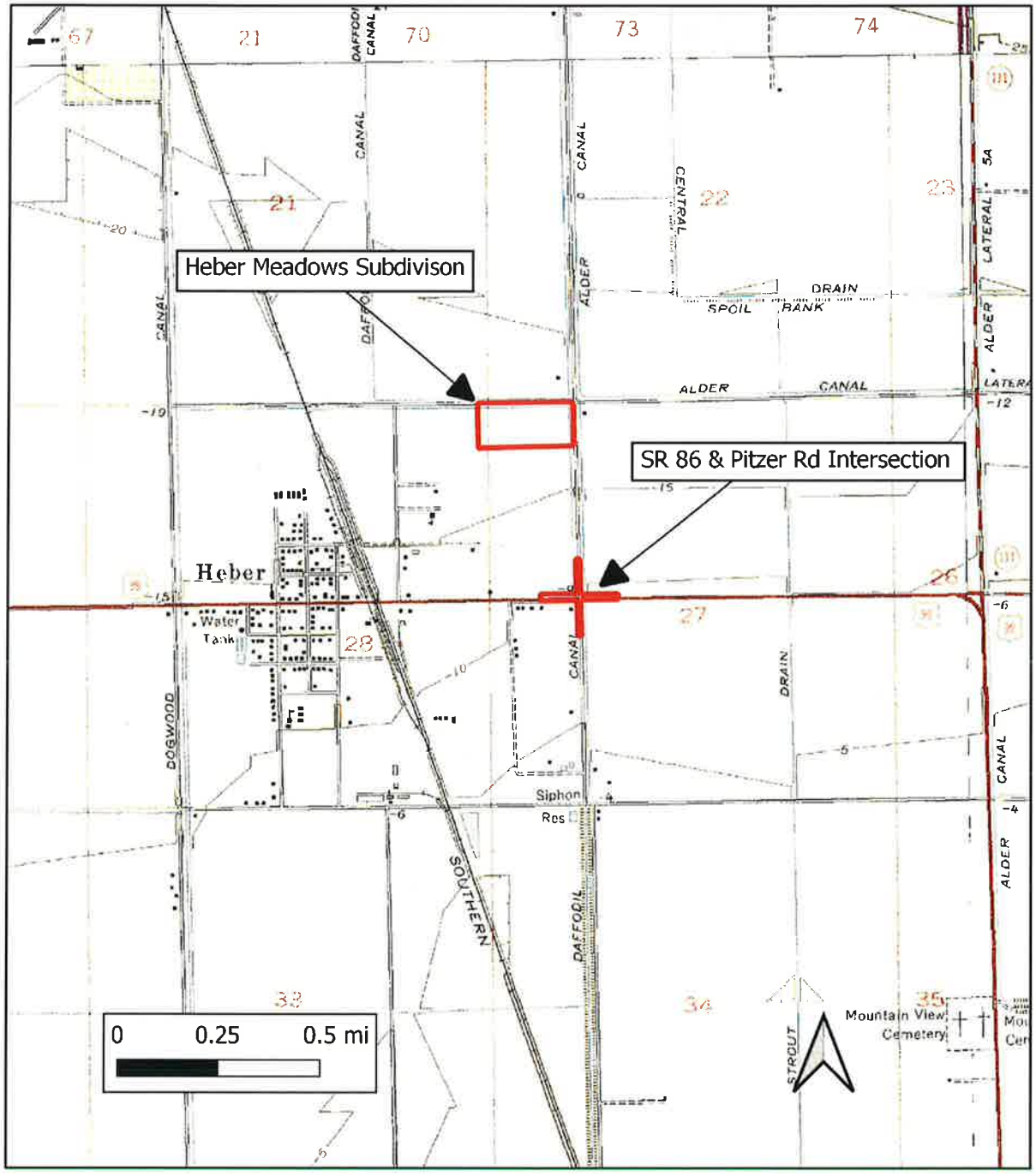
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

RESOURCE CONSULTANTS

March 9, 2021

Quechan Tribe of the Fort Yuma Indian Reservation
Jill McCormick, M.A., Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear HPO McCormick:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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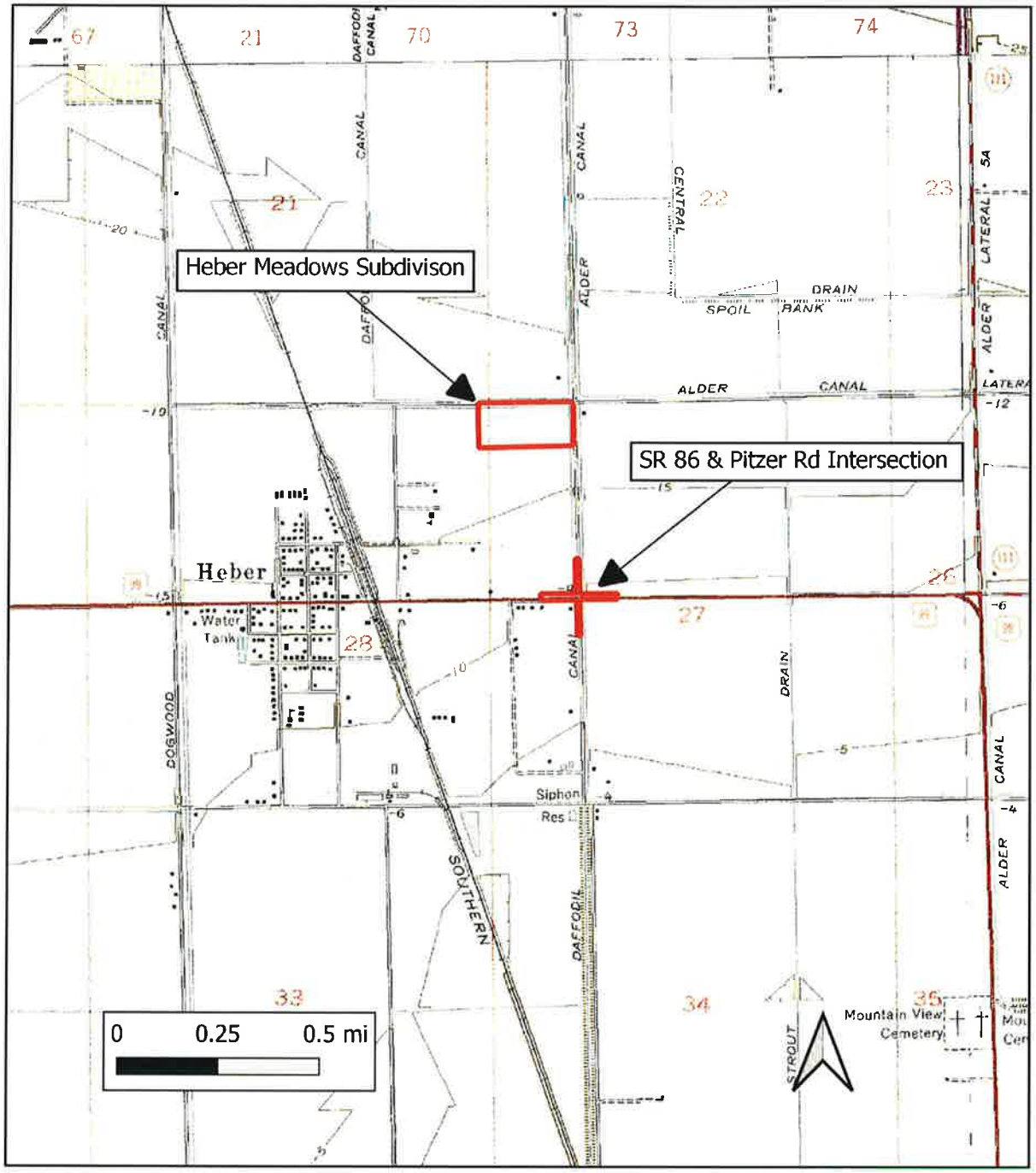

Project Location Map *Heber, CA*

March 9, 2021

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130
Santa Ysabel, CA, 92070

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Perez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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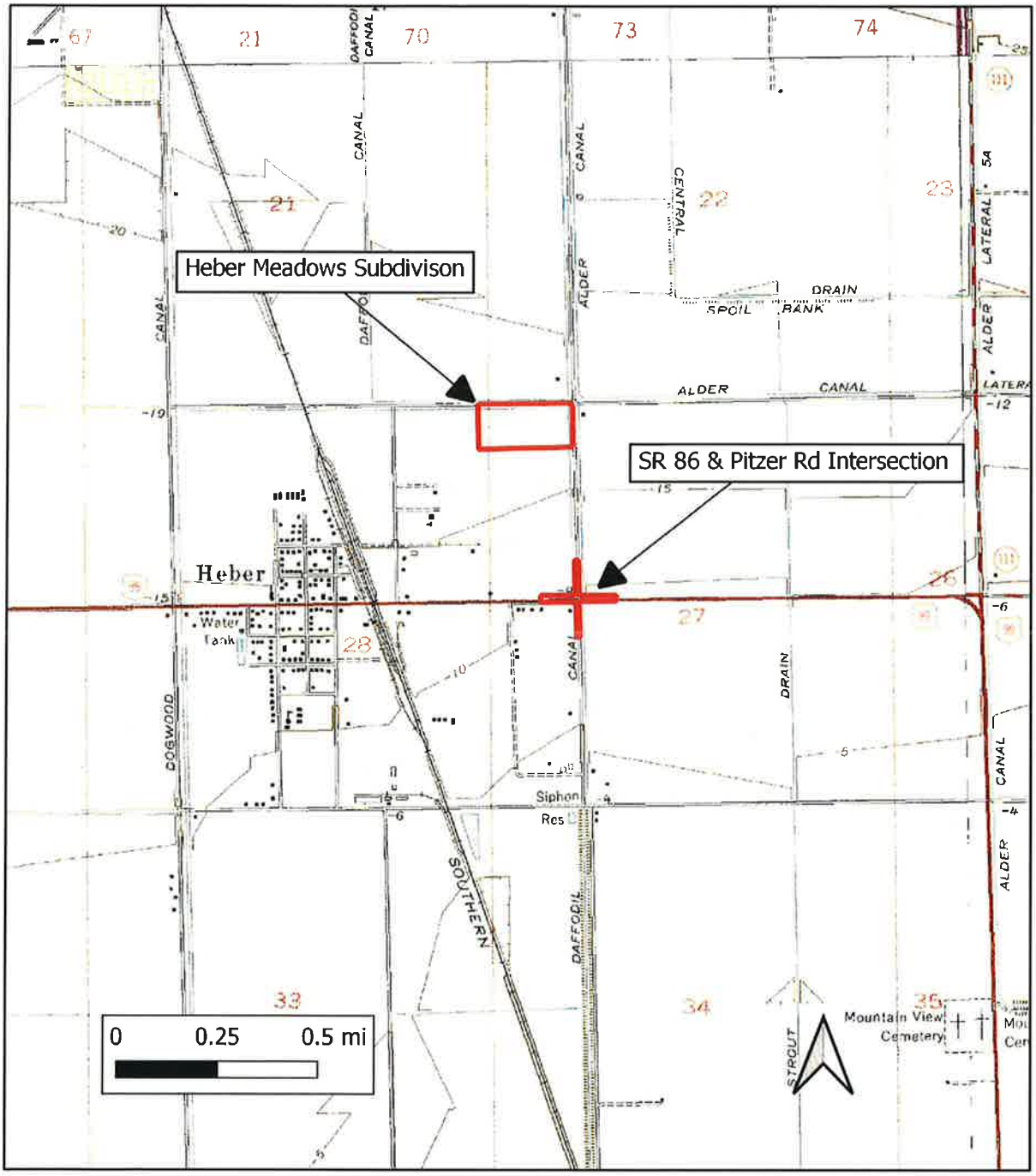
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

RESOURCE CONSULTANTS

March 9, 2021

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd.
Escondido, CA, 92025

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Osuna:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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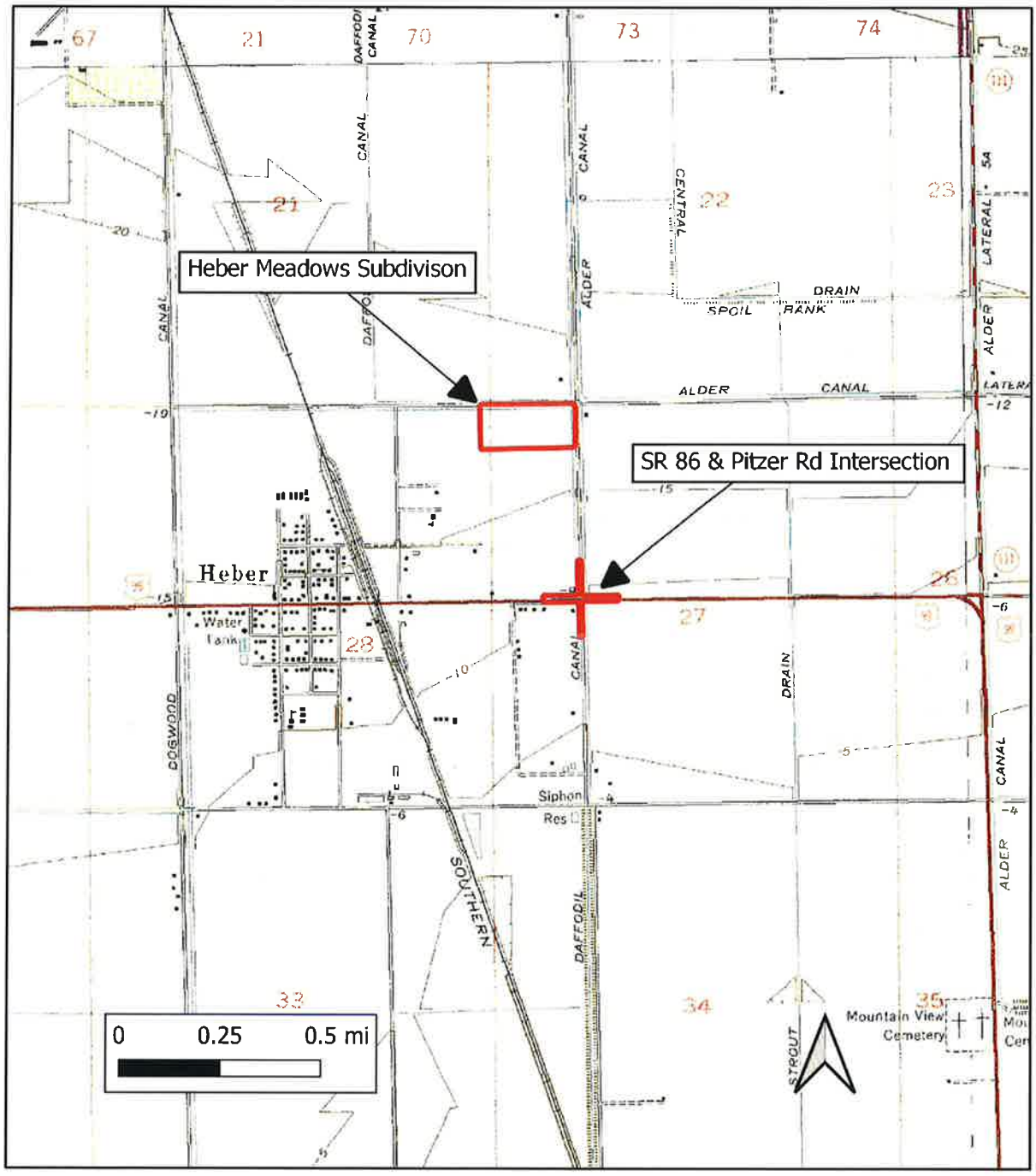
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

March 9, 2021

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612
Jamul, CA, 91935

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Pinto:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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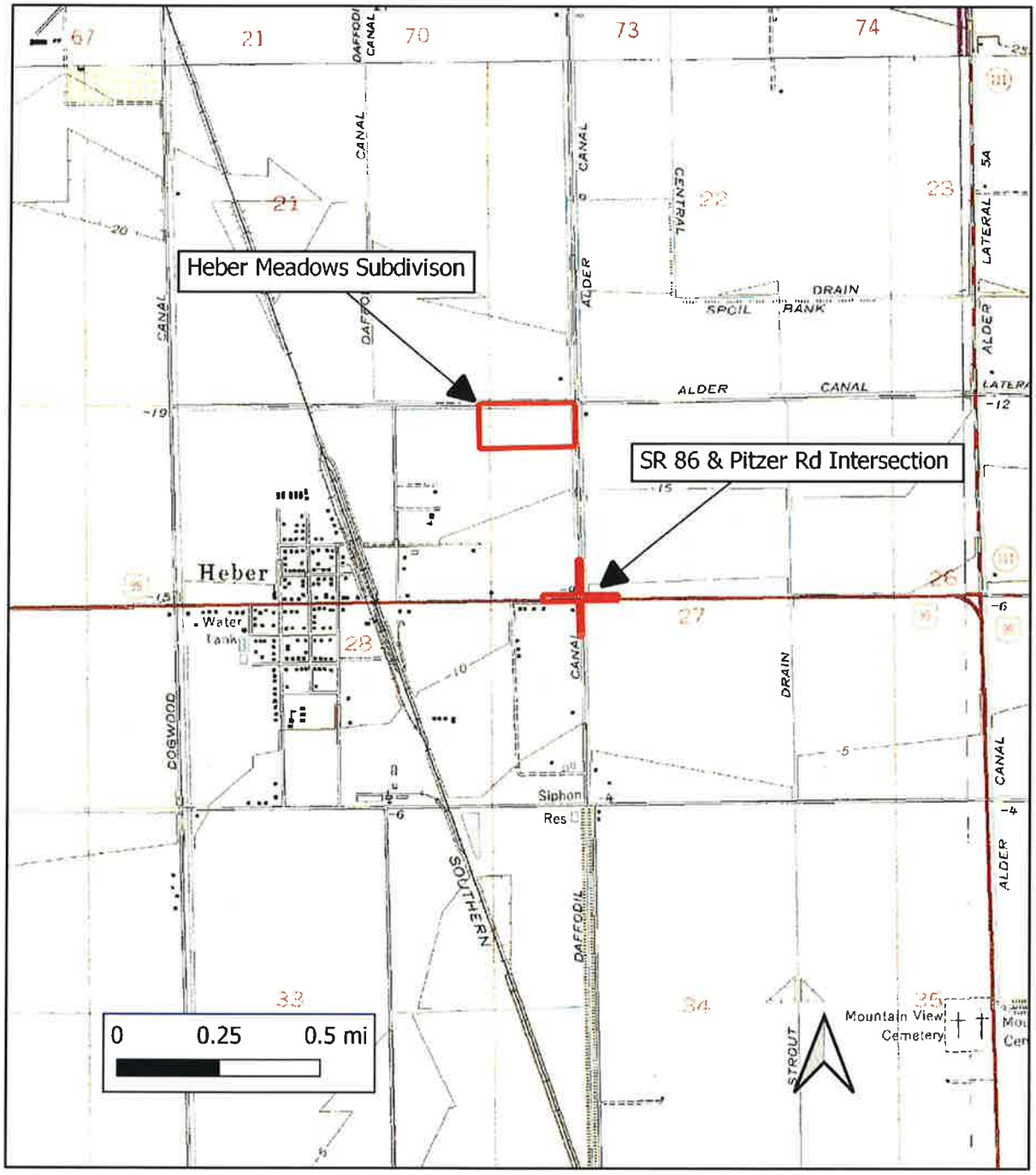

Project Location Map *Heber, CA*

anza

March 9, 2021

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612
Jamul, CA, 91935

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear THPO Cumper:

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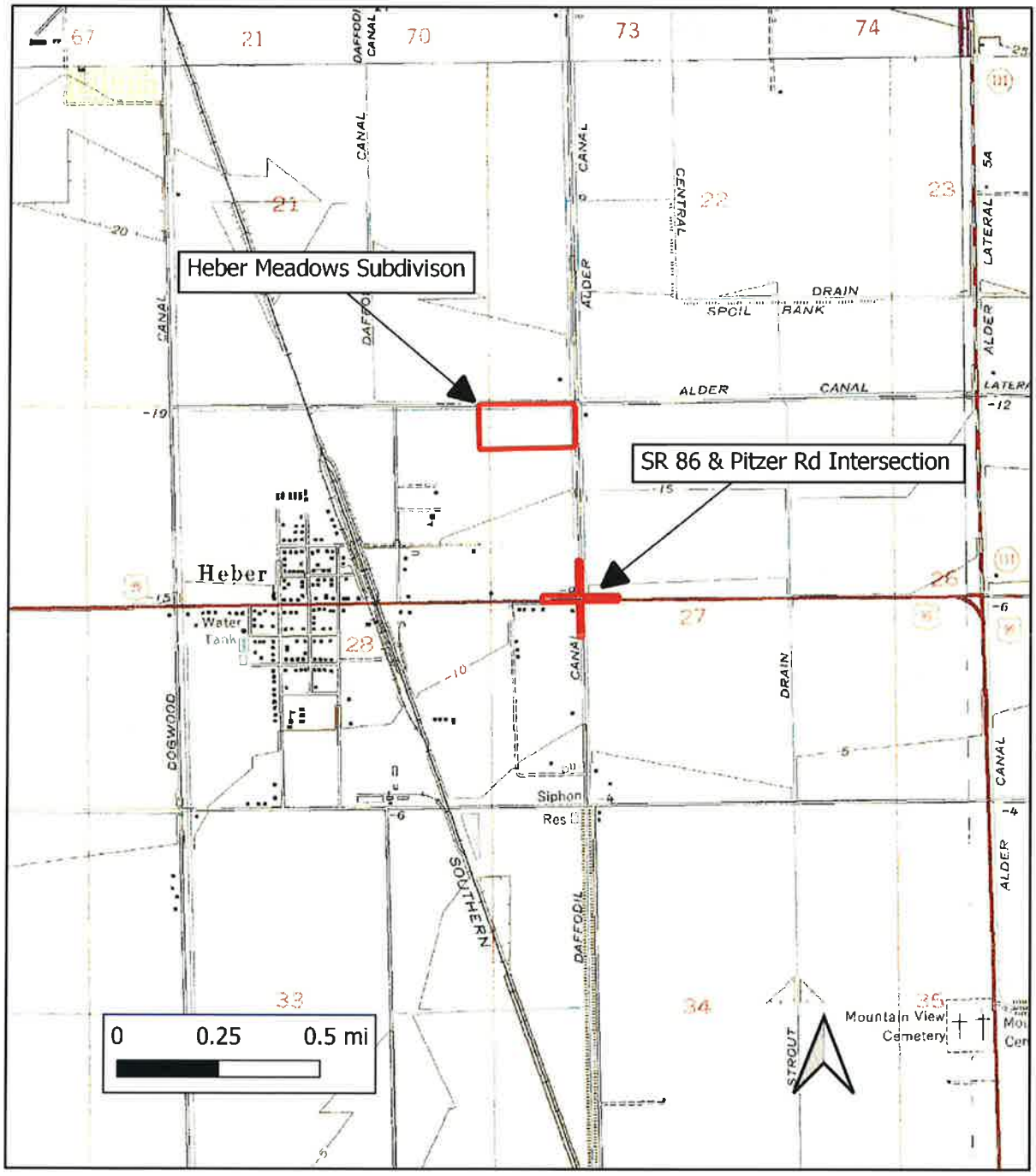

Project Location Map *Heber, CA*

anza

March 9, 2021

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775
Pine Valley, CA, 91962

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Ms. Lucas:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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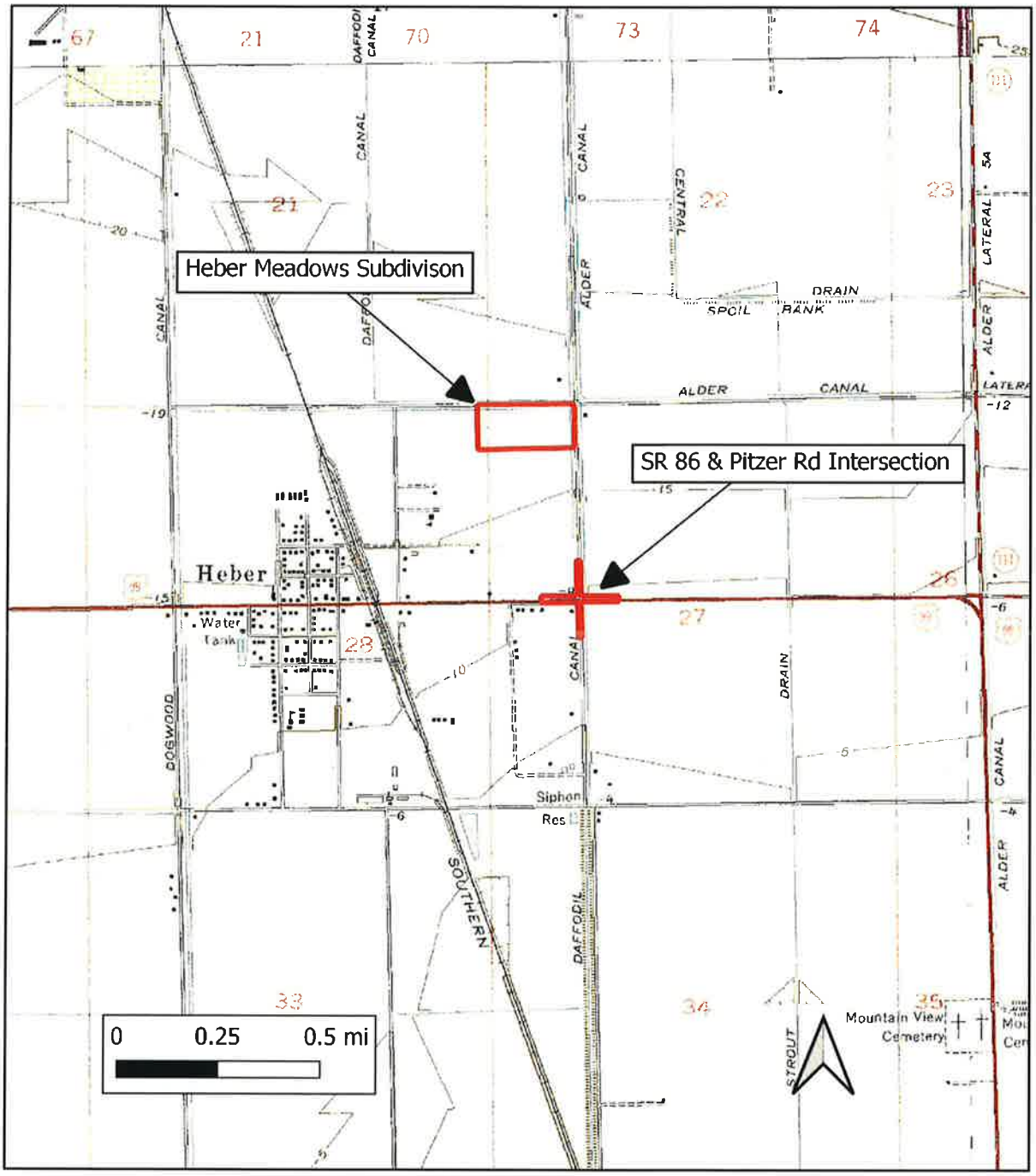

Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2021

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road
Boulevard, CA, 91905

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Parada:

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Oceanside, CA 92054

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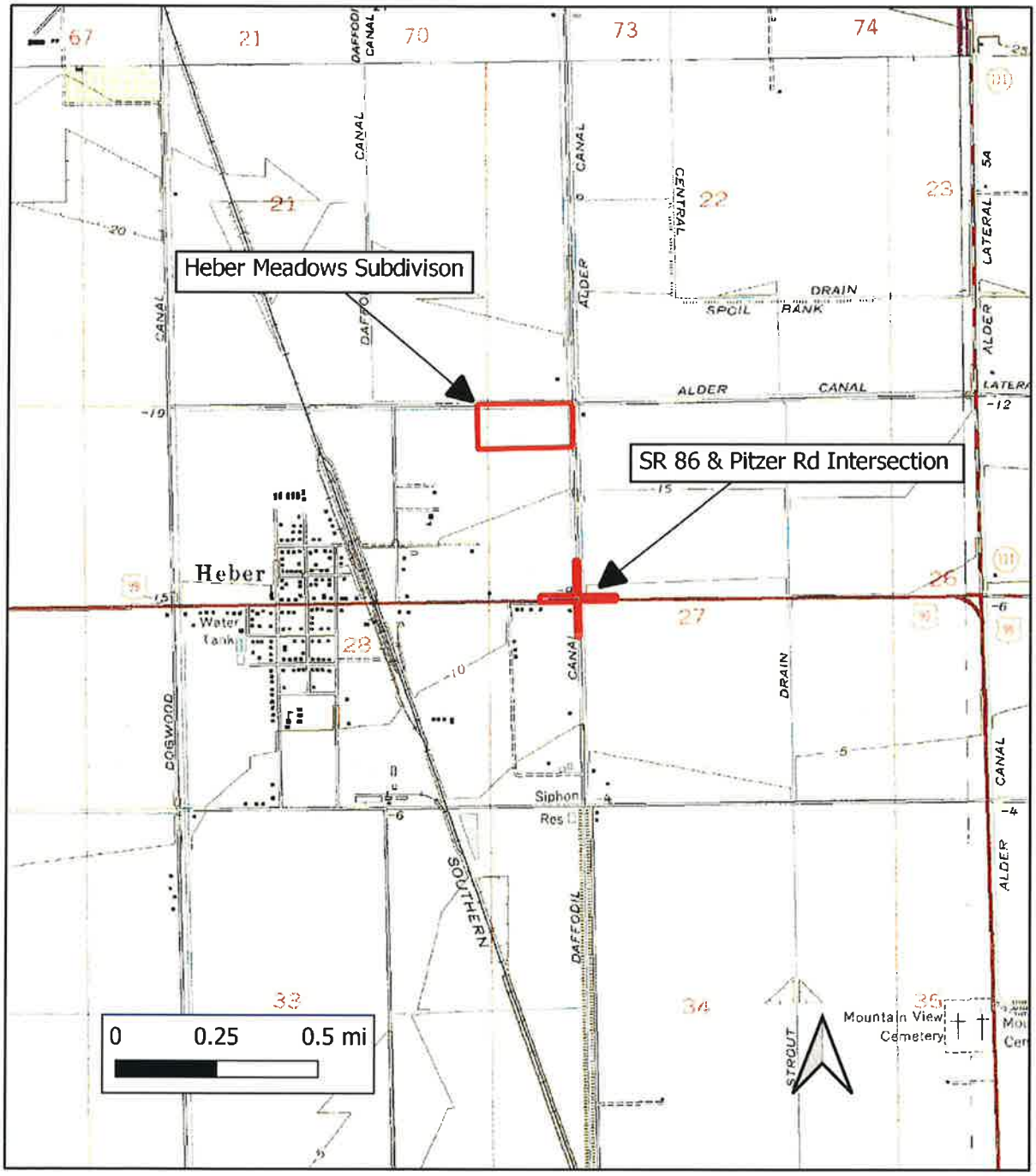

Project Location Map *Heber, CA*

anza

March 9, 2021

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road
Boulevard, CA, 91905

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Administrator Miller:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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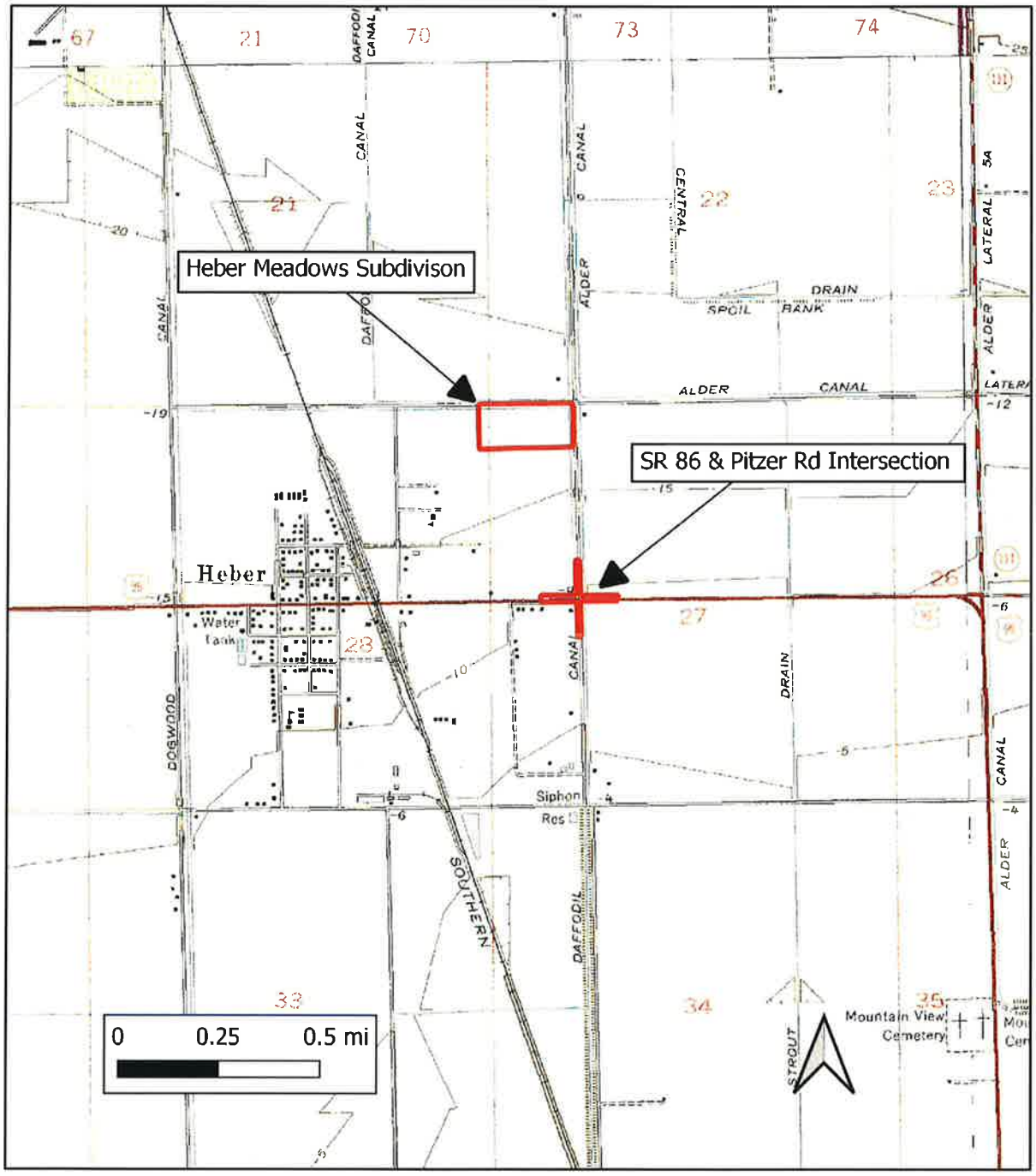
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

March 9, 2021

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270
Santa Ysabel, CA, 92070

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Linton:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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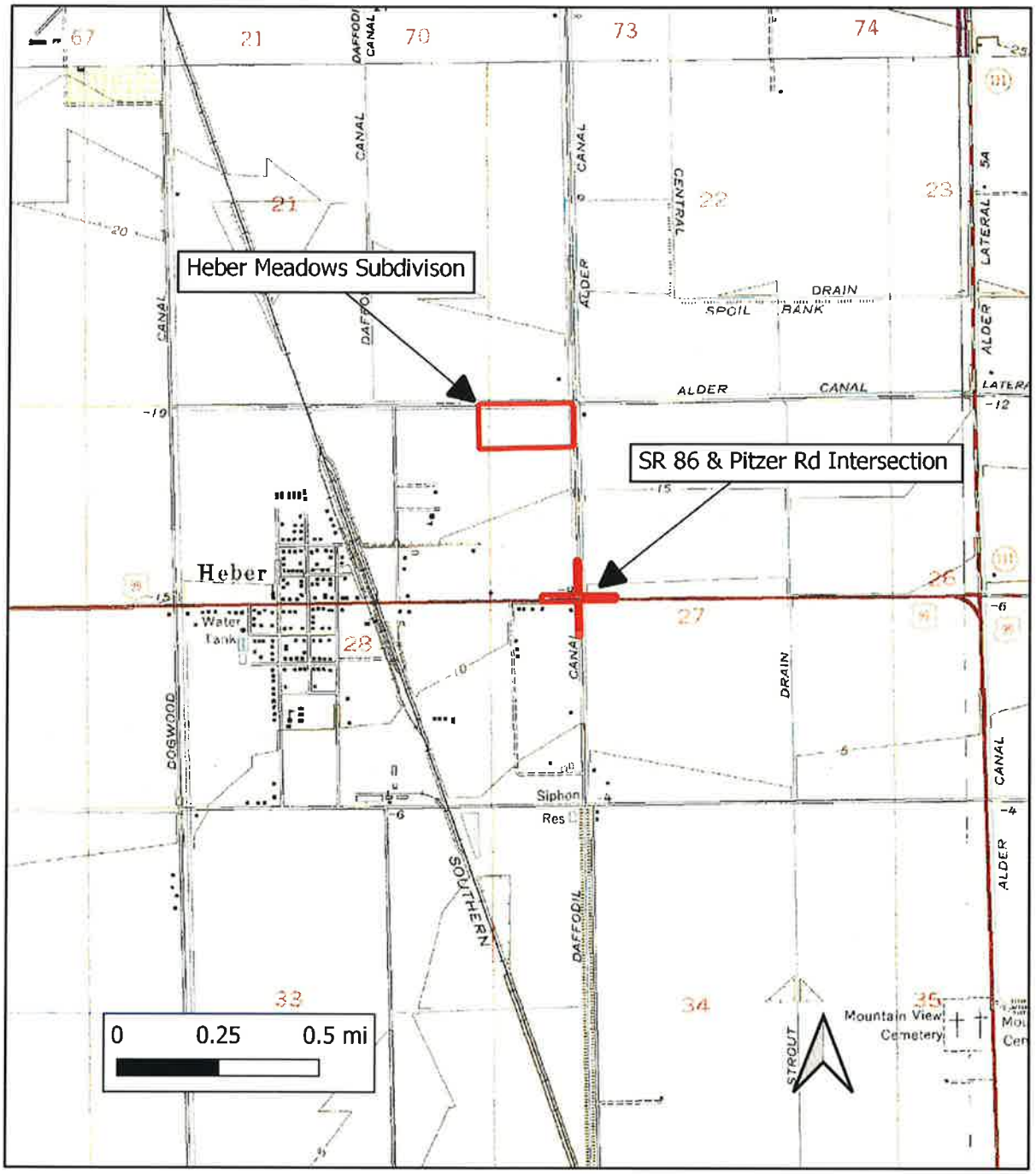


Project Location Map

Heber, CA

anza

March 9, 2021

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA, 92019

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Martinez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

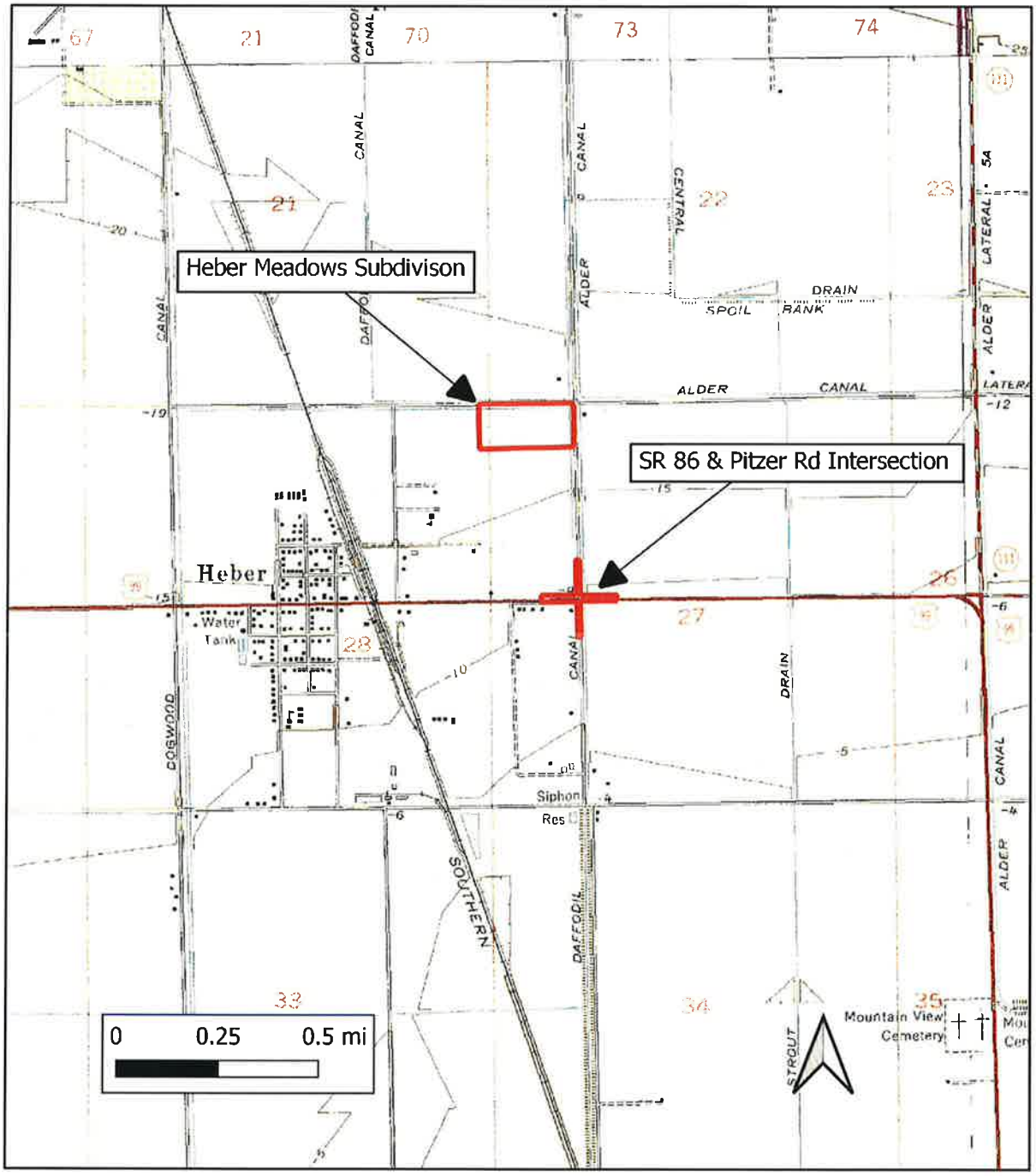
As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Torres-Martinez Desert Cahuilla Indians
Thomas Tortez, Chairperson
P.O. Box 1160
Thermal, CA, 92274

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Tortez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

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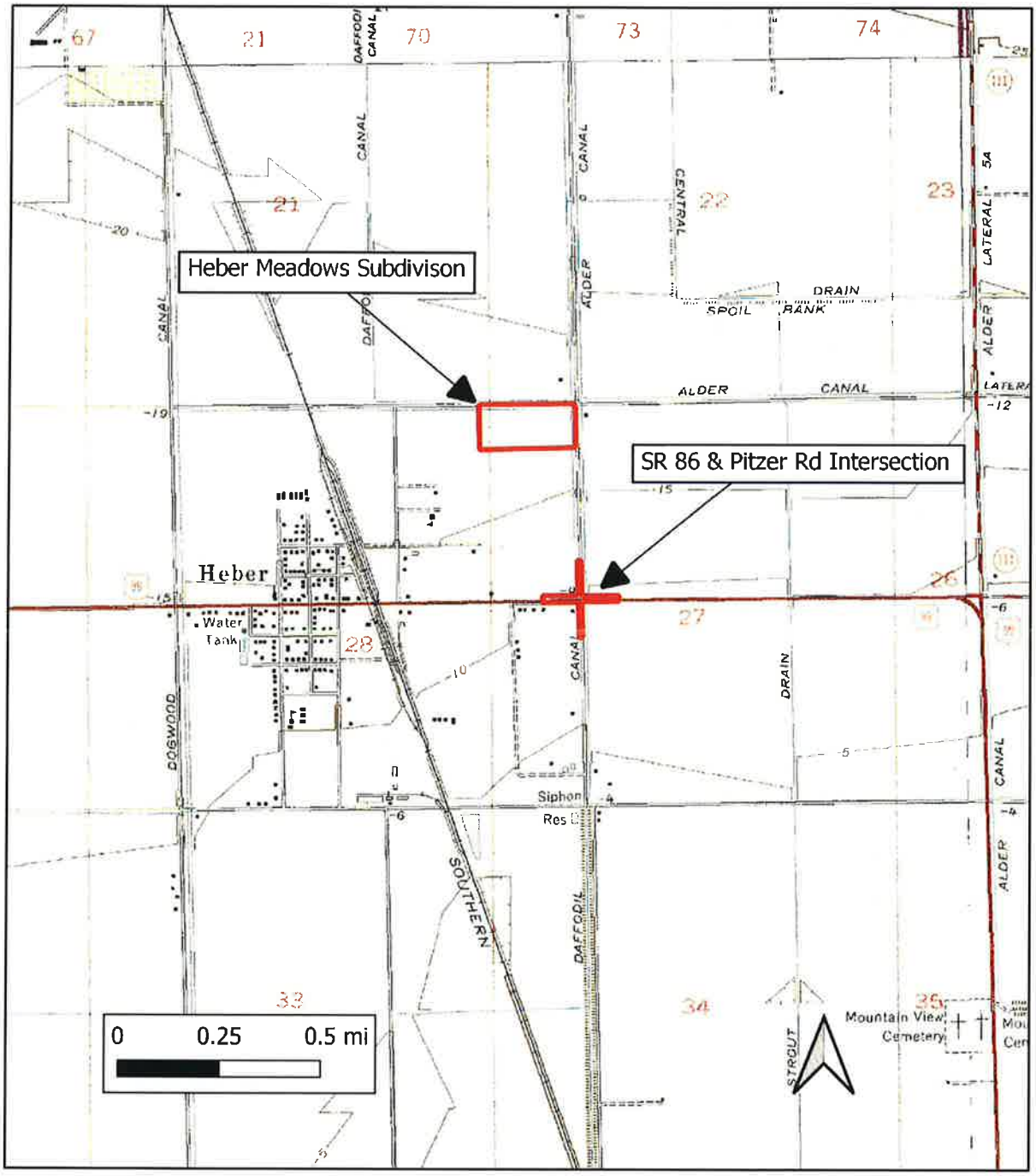
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2021

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road
Alpine, CA, 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Christman:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

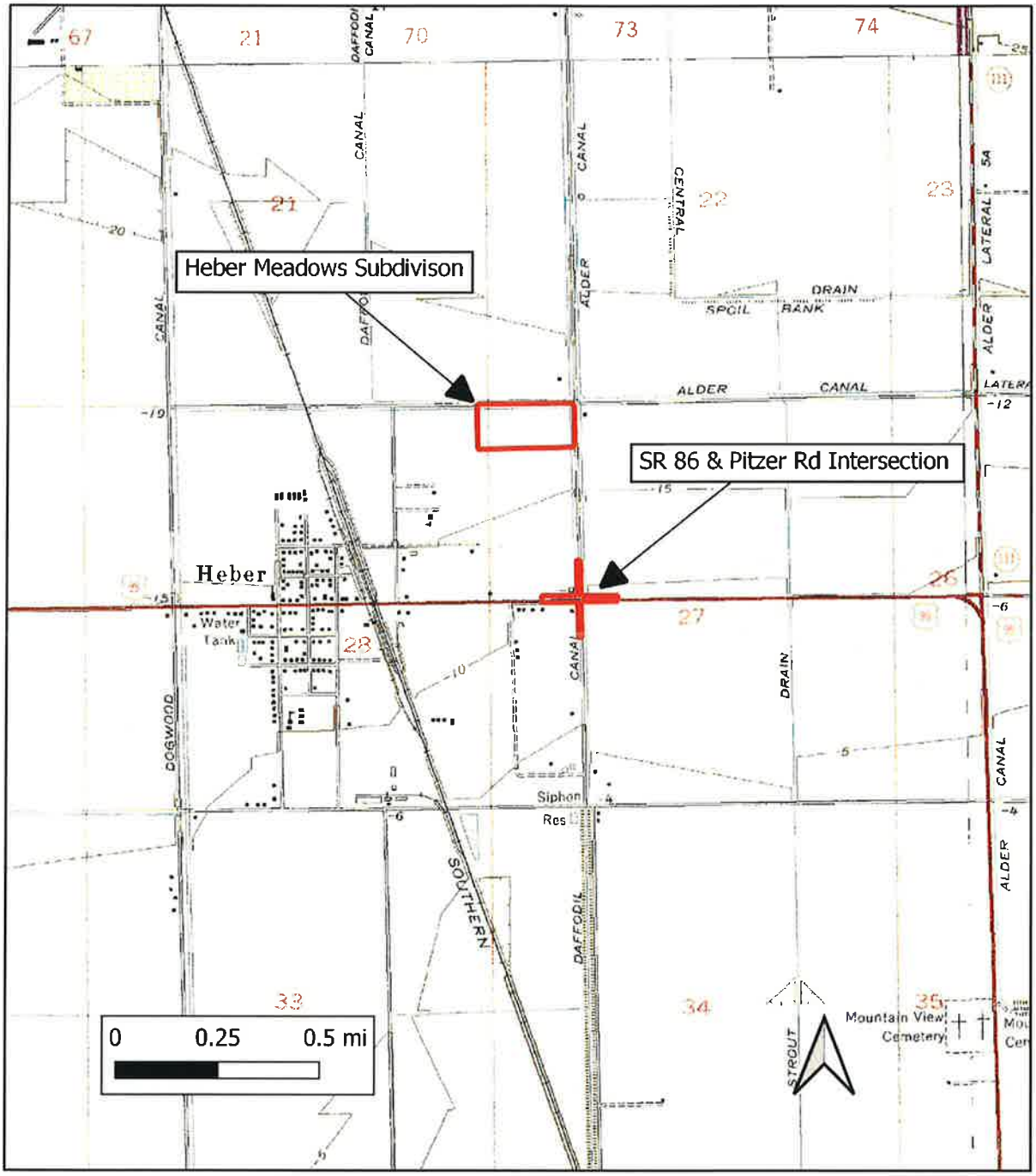
As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

From:	Quechan Historic Preservation Officer
To:	Kevin Hunt
Subject:	Heber Meadows Subdivision and SR 86 & Pitzer Rd. Intersection Improvement Project, Imperial County, CA
Date:	Wednesday, March 17, 2021 1:36:50 PM

This email is to inform you that we have no comments on this project.

Thank you,
H. Jill McCormick, M.A.

Quechan Indian Tribe
Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899
Office: 760-572-2423
Cell: 928-261-0254
E-mail: historicpreservation@quechantribe.com

Virus-free. www.avast.com

Native American Contact Tracking Table- Heber Meadows

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Barona Group of the Capitan Grande ~~Edwin Romero~~ Raymond Welch, Chairperson	1095 Barona Road Lakeside, CA, 92040	~~cloyd@barona-nsn.gov~~ Sue@barona-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Email response 3/18/2021. Forwarded to Councilman Manuel Navarro, who currently handles cultural issues for the tribe. No further response.
Campo Band of Diegueno Mission Indians ~~Ralph Goff~~ Marcus Cuero, Chairperson	36190 Church Road, Suite 1 Campo, CA, 91906	Phone: (619) 478 - 9046 Fax: (619) 478-5818 ~~rgoff@campo-nsn.gov~~ marcuscuero@campo-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Goff no longer Chairman. Spoke with Chairman Marcus Cuero 3/17/2021.
Ewiiaapaayp Band of Kumeyaay Indians Robert Pinto, Chairperson	4054 Willows Road Alpine, CA 91901	wmicklin@leaningrock.net	Letter mailed March 9, 2021	Email March 9, 2021 (letter attached)	No response
Ewiiaapaayp Band of Kumeyaay Indians Michael Garcia, Vice Chairperson	4054 Willows Road Alpine, CA 91901	michaelg@leaningrock.net	Letter mailed March 9, 2021	Email 3/17/2021	No response
Iipay Nation of Santa Ysabel Virgil Perez, Chairperson	P.O. Box 130 Santa Ysabel, CA 92070	Phone: (760) 765 - 0845 Fax: (760) 765-0320	Letter mailed March 9, 2021	n/a	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Inaja-Cosmit Band of Indians Rebecca Osuna, Chairperson	2005 S. Escondido Blvd. Escondido, CA, 92025	Phone: (760) 737 - 7628 Fax: (760) 747-8568 inaja_cosmit@hotmail.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
Jamul Indian Village Erica Pinto, Chairperson	P.O. Box 612 Jamul, CA 91935	Phone: (619) 669 - 4785 Fax: (619) 669-4817 epinto@jiv-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Jamul Indian Village Lisa Cumper, Tribal Historic Preservation Officer	P.O. Box 612 Jamul, CA 91935	Phone: (619) 669 - 4855 lcumper@jiv-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Kwaaymii Laguna Band of Mission Indians Carmen Lucas	P.O. Box 775 Pine Valley, CA, 91962	Phone: (619) 709 - 4207	Letter mailed March 9, 2021	n/a	No response
La Posta Band of Diegueno Mission Indians Gwendolyn Parada, Chairperson	8 Crestwood Road Boulevard, CA 91905	LP13boots@aol.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
La Posta Band of Diegueno Mission Indians Javaughn Miller, Tribal Administrator	8 Crestwood Road Boulevard, CA 91905	Phone: (619) 478 - 2113 Fax: (619) 478-2125 jmiller@LPtribe.net	Letter mailed March 9, 2021	Email 3/17/2021	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Manzanita Band of Kumeyaay Nation Angela Elliott Santos, Chairperson	P.O. Box 1302 Boulevard, CA 91905	(619) 766 – 4930 ljbirdsinger@aol.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
Mesa Grande Band of Diegueno Mission Indians Michael Linton, Chairperson	P.O Box 270 Santa Ysabel, CA 92070	mesagrandeband@msn.com	Letter mailed March 9, 2021	Email 3/17/2021	Email delivery failed. Mailbox was full and not accepting messages. No response
Quechan Tribe of the Fort Yuma Reservation H. Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ 85366	Phone: (760) 572 - 2423 historicpreservation@quechantribe.com	Letter mailed March 9, 2021	N/A	Responded via email 3/17/2021 that the Tribe has no comments on the project.
San Pasqual Band of Diegueno Mission Indians Allen Lawson, Chairperson	P.O. Box 365 Valley Center, CA, 92082	Phone: (760) 749 - 3200 Fax: (760) 749-3876 allenl@sanpasqualtribe.org	Letter mailed March 9, 2021	Email 3/17/2021	No response
Sycuan Band of the Kumeyaay Nation Cody Martinez, Chairperson	1 Kwaaypaay Court El Cajon, CA, 92019	ssilva@sycuan-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Torres-Martinez Desert Cahuilla Indians Thomas Tortez, Chairperson	P.O. Box 1160 Thermal, CA, 92274	Phone: (760) 397 - 0300 Fax: (760) 397-8146 tmchair@torresmartinez.org	Letter mailed March 9, 2021	Email March 9, 2021 (with attached letter)	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Viejas Band of Kumeyaay Indians John Christman, Chairperson	1 Viejas Grade Road Alpine, CA, 91901	Phone: (619) 445 - 3810 Fax: (619) 445-5337 epingleton@viejas-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Email to Tribal Historic Officer Ernest Pingleton No response

Attachment "D"

CULTURAL RESOURCES STUDY
FOR THE
STATE ROUTE 86 AT PITZER ROAD INTERSECTION IMPROVEMENT PROJECT, COMMUNITY OF HEBER, IMPERIAL COUNTY, CALIFORNIA

Prepared for
Ryan Birdseye, Principal
Birdseye Planning Group
1354 York Drive
Vista, CA 92084

Prepared by
Anza Resource Consultants
603 Seagaze Drive, #1018
Oceanside, CA 92054
www.anzaresourceconsultants.com

USGS Quadrangle
Heber, California
Anza Project No. 21-0003

June 2021

EXECUTIVE SUMMARY

Anza Resources Consultants (Anza) was retained by Birdseye Planning Group to prepare a cultural resources study for the State Route 86 at Pitzer Road Intersection Improvement Project (project), located at that intersection in the community of Heber, Imperial County, California.

This cultural resources study includes a cultural resources records search, Sacred Lands File search and Native American scoping, pedestrian survey, recordation and evaluation of a historic built environment resource, and preparation of this technical report in compliance with the cultural resources requirements of the California Environmental Quality Act.

The pedestrian survey identified one CRHR-eligible historic built environment resource within the project site: the Daffodil Canal. This resource has been recommended CRHR-eligible as a contributor to a historic district but project-related impacts to this resource would be less than significant. No further cultural resources work is recommended for this resource.

The cultural resource records search, Native American scoping, and pedestrian survey identified no specific archaeological or Native American resources within or adjacent to the project site and the County of Imperial has identified the area as "zero-to-rare" with regard to prehistoric archaeological sensitivity (see Section 4.2). The Viejas Band of Kumeyaay Indians has identified the project site is within the vicinity of important Native American resources but no additional information has been provided. Anza assumes that government-to-government consultation under AB 52 could further clarify Viejas's position. The project site is heavily disturbed by construction of the existing roads and canal. Based on these results, the archaeological sensitivity of the project site is considered low.

Anza recommends a finding of ***no impacts to archaeological resources*** and **less than significant impacts to historical resources** under CEQA. No further cultural resources study is recommended; however, the following standard measures are recommended to avoid potential impacts from the unanticipated discovery of cultural resources during project related ground disturbing activities.

UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES

If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards for prehistoric or historic archaeology (National Park Service 1997), as appropriate must be contacted immediately to evaluate the find in accordance with CEQA. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation may be warranted.

UNANTICIPATED DISCOVERY OF HUMAN REMAINS

The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a Most Likely Descendant. The Most Likely Descendant shall complete the

inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

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APPENDICES

1. INTRODUCTION

Anza Resources Consultants (Anza) was retained by Birdseye Planning Group to prepare a cultural resources study for the State Route 86 (SR 86) at Pitzer Road Intersection Improvement Project (project), located at that intersection in the community of Heber, Imperial County, California.

The project location is depicted on a portion of the United States Geological Survey (USGS) *Heber, CA* 7.5-minute topographical quadrangle map in Figure 1, and on a Google Satellite aerial background in Figure 2. The project site is located within Sections 27 and 28 of Township 16 South, Range 14 East, San Bernardino Base and Meridian.

This study has been prepared in accordance with the California Environmental Quality Act (CEQA) statutes and guidelines (Section 1.2). This cultural resources study includes a cultural resources records search, Native American scoping, pedestrian survey, recordation and evaluation of a historic built environment resource, and the preparation of this report generally following the Archaeological Resources Management Report (ARMR) guidelines (California Office of Historic Preservation 1990).

1.1 PROJECT DESCRIPTION

The proposed project entails the proposed reconfiguration and control of the SR 86 / Pitzer Road intersection through signalization. Currently, the SR 86 / Pitzer Road intersection is a T-intersection with no north leg. The fourth (north) leg, currently blocked by a Jersey barrier (K-rail), will be provided at this intersection and will provide direct access from SR 86 to the north, connecting to Correll Road. The traffic signal intersection would provide one right-turn lane, one through lane and one left-turn lane in the westbound approach and an exclusive left-turn lane and a shared through/right lane on all remaining approaches.

The existing highway right of way along SR 86 west of Pitzer Road is 100 feet, or 50 feet half-width and east of Pitzer Road the right of way is 80 feet, or 50 feet north and 30 feet south of the centerline. Due to the required pavement widening to accommodate a westbound right turn, westbound left turn and eastbound left turn lane, the project would require 20 feet of right of way acquisition east of Pitzer Road on the north side of SR 86 to accommodate the proposed street widening and street drainage conveyance system. The proposed acquisition area would impact the existing agricultural field and field drainage system.

The existing street Right of Way along Pitzer Road is 53 feet south of SR 86. North of SR 86, title records indicate no recorded easements or grant deeds for street purposes from up to Meridian Street, approximately 720 feet north of SR 86. The project would require 65 feet of right of way acquisition west of Pitzer Road north of SR 86. In addition, due to sight distance requirements, additional acquisition is required for sight corners at the northwest and southwest quadrants of the intersection. The sight corner acquisition at the northwest corner would impact an existing farm implement dealer and at the southwest corner the acquisition would be from a single-family home residence. East of Pitzer Road, Imperial Irrigation District (IID) operates an agricultural irrigation channel (the Daffodil Canal), which will be impacted by the proposed intersection widening. Additionally, IID has senior rights for the easement within the canal area. Therefore, the improvements and subsequent land encroachments will be coordinated with IID during the design process.

1.2 Regulatory Setting

1.2.1 State

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

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

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

In addition, if it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC, Section 21083.2[a], [b], and PRC, Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, the probability is high that it meets any of the following criteria:

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

California Assembly Bill 52 of 2014 (AB 52) took effect July 1, 2015, and expanded CEQA by establishing a formal consultation process for California tribes within the CEQA process. The bill specifies that any project that may affect or cause a substantial adverse change in the significance of a tribal cultural resource would require a lead agency to "begin consultation with a California Native American tribe that is traditional and culturally affiliated with the geographic area of the proposed project." According to the legislative intent for AB 52, "tribes may have knowledge about land and cultural resources that should be included in the environmental analysis for projects that may have a significant impact on those resources." Section 21074 of AB 52 also defines a new category of resources under CEQA called "tribal cultural resources." Tribal cultural resources are defined as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is either listed on or eligible for the California Register of Historical Resources or a local historic register, or if the lead agency chooses to treat the resource as a tribal cultural resource. See also PRC 21074 (a)(1)(A)-(B).

1.3 PERSONNEL

Anza Principal and Senior Cultural Resources Specialist Kevin Hunt requested the cultural resources records search, conducted the Native American scoping, survey, and historic resource evaluation, prepared all GIS, forms, and figures, and was the primary author of this report. Mr. Hunt meets the Secretary of the Interior's Historic Preservation Professional Qualification Standards for history (National Park Service 1997). Principal Investigator Katherine Collins, M.A., Registered Professional Archaeologist (RPA), coauthored this report and served as principal investigator for the study. Ms. Collins meets the Secretary of the Interior's Historic Preservation Professional Qualification Standards for archaeology (National Park Service 1997).

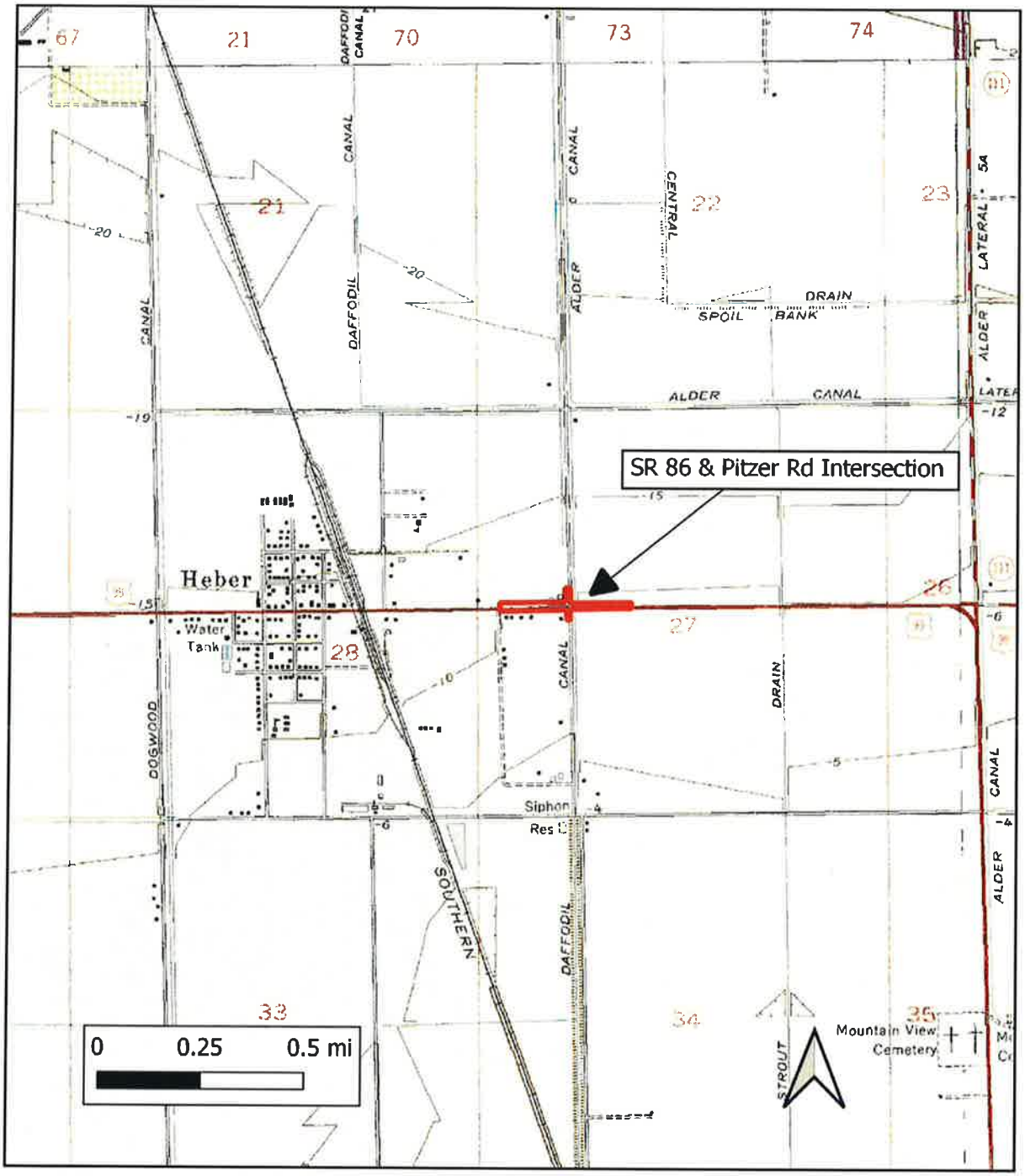
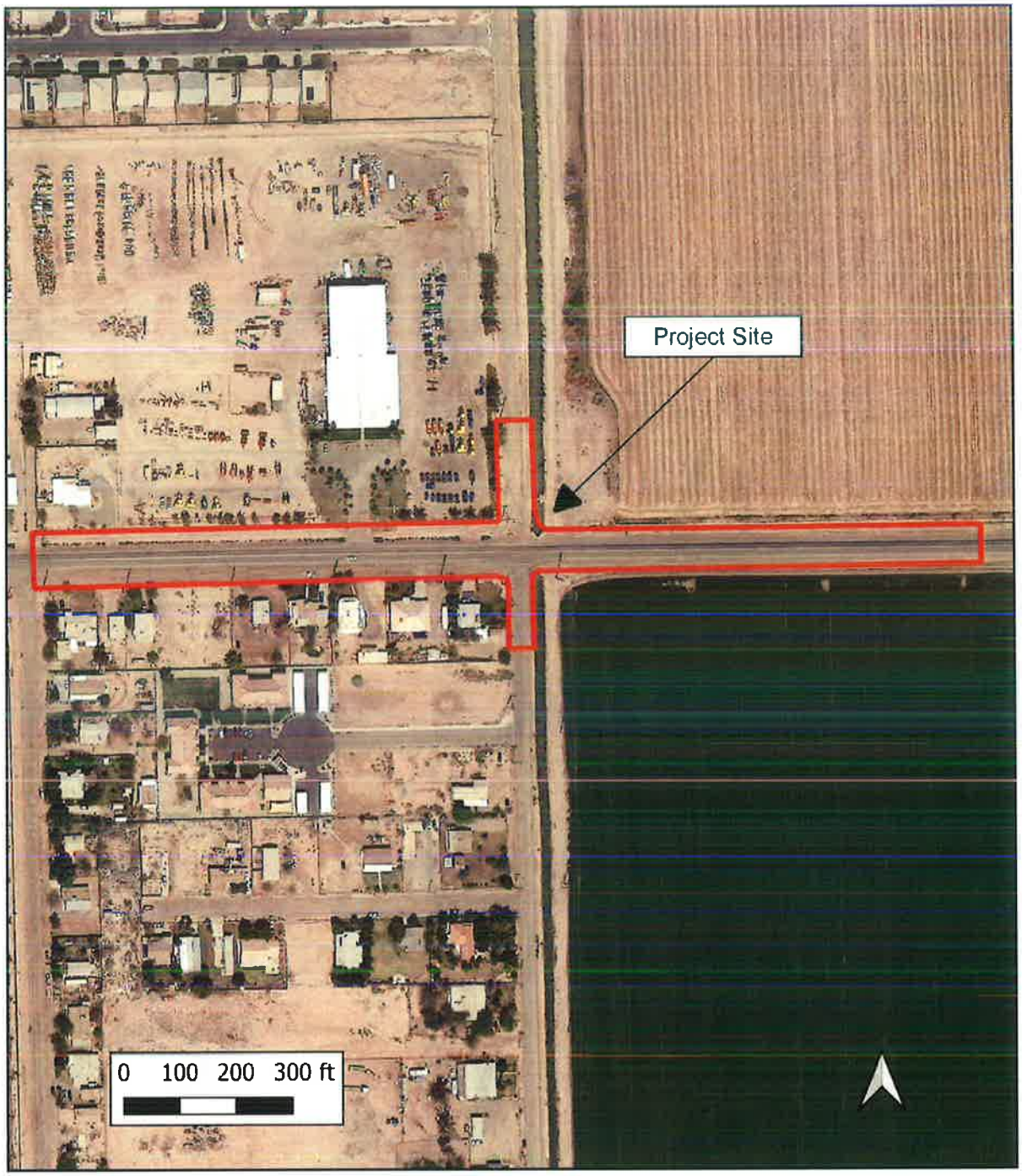


Figure 1. Project Location Map



Google Satellite Image

Figure 2. Aerial Overview of Project Site

2. ENVIRONMENTAL SETTING

The project site is located within the community of Heber, approximately three miles south of Interstate 8 in Imperial County. The project site is located within the Imperial Valley portion of the Salton Trough at an elevation of approximately three meters (10 feet) below mean sea level. The project site, and Imperial Valley in general, is within the Colorado Desert, which receives little rainfall (average 76 mm [3 inches] per year) and maintains high temperatures, particularly during the summer. Nevertheless, the project vicinity is within a predominantly agricultural area supplied with Colorado River water via the All-American Canal system. The Daffodil Canal is within the east edge of the project site. Geologically, the project area is underlain by moderately well drained lacustrine sediments of Pleistocene and Holocene age associated with ancient Lake Cahuilla, which covered the project site during various prehistoric stands. Average monthly low/high temperatures range from approximately 42.5/69.5 degrees Fahrenheit (5.8/20.8 degrees Celsius) in December to 77.8/106.7 degrees Fahrenheit (25.4/41.5) degrees Celsius) in July.

3. CULTURAL SETTING

3.1 ETHNOGRAPHY/HISTORY

The project lies in what generally is described as the Colorado Desert region (Schaefer and Laylander 2007:247). Though it shares similarities with the adjacent Mojave and Sonoran deserts, the Colorado Desert possesses a unique and distinct natural and cultural history.

Although now an arid region, a series of lakes collectively referred to as Lake Cahuilla (Lake LeConte, Blake's Sea) covered much of the Salton Trough throughout the Holocene. Lake Cahuilla was formed by the western diversion of the Colorado River into the Salton Trough when natural sediment barriers blocked the river's flow south to the Gulf of California. After at least three episodes of infilling and recession between A.D. 1200 and the late 1600s, Lake Cahuilla is believed to have receded for the last time around A.D. 1580, with a brief inundation in the late 1600s (Buckles and Krantz 2005; Laylander 1995; Schaefer and Laylander 2007; Waters 1983). The freshwater fish, shellfish, migratory birds, and riparian flora and fauna associated with the lake may have been important factors in human subsistence and settlement patterns during most of the Prehistoric Period.

Southern California's prehistory, including the Colorado Desert, is typically divided into three major periods: Paleoindian (ca. 9500–6500 B.C.), Archaic (ca. 6500 B.C.– 500 A.D.), and Late Prehistoric (500 A.D. –historic contact) (Jones and Klar 2007; Moratto 1984). Paleoindian sites are generally identified by spear points associated with large game hunting and crescentics; Archaic sites by a preponderance of marine shell middens and portable ground stone tools associated with a collecting subsistence strategy; and Late Prehistoric sites with small projectile points for bow and arrow use, often of exotic lithic materials, ceramic pottery, and cremation of the deceased.

The Kumeyaay (also called Tipai, Kamia, or Desert Kumeyaay locally) occupied southern San Diego County and portions of Imperial County including the current project site at the time of Spanish contact (Carrico 1987; Luomala 1978). The Kumeyaay language is considered a member of the Yuman language family. The Kumeyaay people practiced seasonal hunting and gathering with relatively large village centers (Moratto 1984). The easternmost Kumeyaay of the Colorado Desert practiced limited horticulture (Luomala 1978).

Father Eusebio Francisco Kino, a Jesuit missionary, reached the Colorado River in 1702 and was the first recorded Spanish explorer to enter the Colorado Desert. In 1771, Friar Francisco Garcés made trips into the region following Kino's route crossing the Colorado River from the east. Juan Bautista de Anza, a Spanish soldier, led a 1774 expedition accompanied by Garcés that successfully crossed the Colorado River into the Imperial Valley. In 1775, Anza returned accompanied by more than 240 emigrants and soldiers who crossed the Colorado into present-day Imperial County with assistance from the Yuma tribe (Pourade 1971). This group of emigrants established the mission and presidio of San Francisco. Anza's route across Imperial Valley became known as the Desert Trail, which was abandoned by European travelers following the 1781 destruction of Spanish settlements along the Colorado River by Quechan Indians. Among the destroyed were the missions of Puerto de Purisíma Concepción and San Pedro y San Pablo de Bicuñer, which had been established in 1780 (Bean 1968:45). The Desert Trail was not used again until the Mexican period.

European presence in the region expanded during Mexican Period (1822–1848) and American Period (1848–present), decimating and displacing the Kumeyaay. Their numbers were diminished because of European disease, relocation to reservations, and other factors (Carrico 1987). Also, during the Mexican period, the Desert Trail was reestablished by Mexico in 1822. Lieutenant of Engineers Romualdo

Pacheco and several soldiers built and occupied an adobe fort along the route near the present-day city of Imperial in 1825-1826, the only Mexican fort in Alta California. On April 26, 1826, Kumeyaay Indians attacked the fort, killing three soldiers and wounding others, which led Pacheco to abandon the fort and return to San Diego (California Office of Historic Preservation n.d.).

3.1.1 Imperial County

Imperial County was created on August 15, 1907, from the east half of San Diego County and was the last county to be organized within California (O'Dell 1957:8). The County occupies 4,087 square miles and is bordered by Mexico to the south, the Colorado River and Arizona to the east, Riverside County to the north, and San Diego County to the west. Imperial County remained largely undeveloped with few settlers during the Spanish, Mexican, and early American Periods until water from the Colorado River was diverted to this arid basin. Irrigated agriculture was the dominant factor in the settlement and development of Imperial County.

On May 14, 1901, the Alamo Canal, which directed water from the Colorado River at Yuma into Mexico and back into California, delivered the first small flow of water to fields in the Calexico area, with larger flows starting in 1902 (O'Dell 1957:87- 88: Hendricks 1971:6). The successful California Development Company, planning for settlers, named the newly reclaimed desert area Imperial Valley (Hendricks 1971:8; Bright 1998:70). By 1905, the Imperial Valley had 80 miles of canals and 700 miles of distribution canals with an estimated 67,000 irrigated acres. Soon there were 12 water districts in the Imperial Valley that obtained most of their water from the Colorado River. Ten of these districts obtained water from the California Development Company. Agricultural pursuits proved to be very profitable within the first two decades after the start of irrigation. An influx of people with the ever-growing agricultural production also spurred growth of allied industries, including beekeeping and dairy and poultry farming.

Several major floods occurred along the Colorado River and the Alamo Canal between 1904 and 1907. Breaches along the riverbank allowed the water to spill into Imperial Valley. Attempts to stop the flooding failed until early 1907 when the river was diverted back to its natural course (O'Dell 1957:90). The series of floods left a large lake in the middle of the Salton Basin, covering an area 50 by 15 miles and encompassing 285,000 acres. This newly formed body of water was named the Salton Sea. In 1922, legislation was introduced requesting the construction of a dam at Boulder Canyon, which would prevent future large-scale flooding. Hoover Dam was completed by 1936 and the All-American Canal was constructed during the 1930s and completed in 1940.

Many vegetables, fruit, and other crops thrive in the Imperial Valley. Cotton was first grown and ginned in 1909, with 50,000 acres devoted to this crop by 1914 (McGroarty 1914:27). Alfalfa was a major crop in the Imperial Valley and although horses and mules were used for canal construction, hauling freight, and clearing land, production exceeded demand (Anderholt 1989:7). Dairy farming in the valley was one result of surplus alfalfa being too expensive to export. Dairying soon became the "greatest industry in the development of the Imperial Valley" and by the early 1920s there were 2,000 operating dairies (Anderholt 1989:53). Imperial County is also rich in mineral resources, including large deposits of fine clays, gypsum, and marble, among others, with mining being another major industry (Morton 1977).

The community of Paringa and founded by the Imperial Land Company in 1901 as a shipping point for the southern Imperial Valley to the east of present-day Heber (Federal Writers' Project 1954:462). Following completion of the Southern Pacific Railroad, in 1903 the town was relocated west and renamed Heber after a president of the California Development Company. Dowd (1956:23) states that the original name of the town established in 1903 was Bradtmoore, but later changed to Heber.

3.1.2 The All-American Canal

The Imperial Irrigation District (IID) was formed in 1911, by which time the leaders of Imperial Valley were already desirous of a canal entirely within the United States that would deliver water from the Colorado River to Imperial Valley (Dowd 1956:88). The existing Alamo (or Imperial) Canal, which was completed in 1901, passed through Mexico on its way back into the valley and therefore was not entirely within U.S. control for volume or pricing. In 1905, exceptional winter floods on the Gila River passed into the Colorado River and overflowed the Alamo Canal system (Imperial Irrigation District 1977). The flood was not controlled until 1907, by which time the bottom of the ancient Lake Cahuilla basin, or Salton Sink, was refilled enough to create the Salton Sea.

The 80-mile-long All-American Canal was completed in 1940 providing a reliable irrigation and drinking water source for the valley. From the Imperial Dam on the Colorado River where water is diverted and conveyed by gravity through the All-American Canal to its three major distribution canals: The East Highline, Central Main, and Westside Main canals (CH2M Hill 2001). Per CH2M Hill (2001), "These three canals serve as the main arteries of a system consisting of approximately 1,667 miles of canals and laterals that distribute irrigation water within IID's service area."

The East Highline Canal generally serves the portion of IID's service area east of the Alamo River, the Central Main Canal serves the area between the Alamo River and the New River, and the Westside Main Canal serves the area west of the New River. This distribution system was in place and supplied water by the Alamo Canal prior to completion of the All-American Canal, with most local canals pre-dating completion of the All-American. The Daffodil Canal, adjacent to the project site, is part of the Central Main Canal system. In addition to providing water to IID's distribution network, the 123-mile Coachella Canal branches off from the All-American Canal to deliver water to the Coachella Valley. The system, as a whole, irrigates more than 600,000 acres of land in Imperial and Coachella valleys with Colorado River water (Bureau of Reclamation no date [n.d.]).

4. BACKGROUND RESEARCH

4.1 CALIFORNIA HISTORICAL RESOURCE INFORMATION SYSTEM

Anza requested a records search of the California Historical Resources Information System (CHRIS) at the South Coastal Information Center (SCIC) located at San Diego State University. The search was requested to identify previous cultural resources studies and previously recorded cultural resources within a one-mile radius of the project site. A CHRIS search was conducted on February 25, 2021, that included a review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list. The records search also included a review of all available historic USGS 7.5-, 15-, and 30-minute quadrangle maps. A summary of the records search results is presented in Appendix A.

4.1.1 Previous Studies

The SCIC records search identified 23 cultural resources studies that were conducted within a one-mile radius of the project site (Table 1). Six of the studies are mapped at SCIC as including at least portions of the project site (SD-00063, SD-00066, SD-00123, SD-00192, SD-00272, SD-00368). None of the six previous studies that included portions of the project site identified cultural resources within the project site.

Table 1. Previous Cultural Resource Studies within a One-Mile Radius of the Project Site

Report Number	Author	Year	Title	Proximity to Project Site
IM-00063	Von Werlhof, Jay and Shrilee Von Werlhof	1976	Archaeological Examination of a Proposed Geothermal Testing Site Near Heber, California	**Includes APE**
IM-00066	Von Werlhof, Jay and Shrilee Von Werlhof	1976	Archaeological Record Search of the Heber, California, Region	**Includes APE**
IM-00115	Von Werlhof, Jay and Shrilee Von Werlhof	1977	Archaeological Examination of the Heber Anomoly Report Prepared for VTN Consolidated, Inc.	Approximately 0.4 mile north
IM-00123	VTN Consolidated, Inc.	1977	Draft Environmental Impact Report for the Heber Geothermal Demonstration Project	**Includes APE**
IM-00185	Von Werlhof, Jay and George E. Collins	1979	Archaeological Examinations of Proposed Geothermal Facilities Near Heber, CA	Approximately 0.45 mile south
IM-00192	VTN Consolidated, Inc.	1979	Draft Master Environmental Impact Report for a 500-Megawatt Geothermal Development at Heber, Imperial County, California	**Includes APE**
IM-00199	Walker, Carol, Charles Bull, and Jay Von Werlhof	1979	Cultural Resource Study of a Proposed Electric Transmission Line from Jade to the Sand Hills, Imperial County, California	Approximately 1 mile south

Report Number	Author	Year	Title	Proximity to Project Site
IM-00233	Walker, Carol, Charles Bull, and Jay Von Werlhof	1981	Cultural Resource Study of a Proposed Electric Transmission Line from Jade to the Sand Hills, Imperial County, California	Approximately 1 mile south
IM-00272	Sanchez, Miguel	1982	Draft Environmental Impact Report - Current Land Use Plan, Heber Planning Unit	**Includes APE**
IM-00368	Imperial County Planning Department	1987	Chevron Geothermal Company of California Supplemental Project Information for the Auxiliary Production Facility Heber Geothermal Unit, Imperial County	**Includes APE**
IM-00441	ENSR Consulting and Engineering	1990	Environmental Assessment/Initial Study for the Placement of Fiber Optic Facilities Between Salton Microwave Station and Calexico California	Approximately 1 mile west
IM-00536	Burkenroad, David	1979	Phase One Regional Studies APS/SDG&E Interconnection Project Transmission System Environmental Study Cultural Resources: History	Approximately 1 mile south
IM-00537	Wirth Associates, Inc.	1979	Phase One Regional Studies APS/SDG&E Interconnection Project Transmission System Environmental Study Cultural Resources: Archaeology	Approximately 1 mile south
IM-00538	Imperial County	1979	Proposed Workscope Phase II Cultural Resources Studies APS-SDG&E Transmission Interconnect Project, Miguel to Sand Hills, Sand Hills to Pvngs	Approximately 1 mile south
IM-00547	Cultural Systems Research, Inc.	1982	Draft Archaeological Research Design and Data Recovery Program for Cultural Resources within the Mountain Springs (Jade) to Sand Hills Portion of the APS/SDG&E Interconnection Project 500Kv Transmission Line	Approximately 1 mile south
IM-00595	CSRI	1982	Mountain Springs (Jade) to Sand Hills Data Recovery Preliminary Report	Approximately 1 mile south
IM-01080	Von Werlhof, Jay	1999	Archaeological Examinations of the Heber Facilities Sewer and Water Improvements Project	Approximately 1 mile west
IM-01095	Garnsey, Michael	2007	Cultural Resources Study for the Proposed Mosaic Project, Imperial County, California	Approximately 0.8 mile southwest
IM-01102	ESA	2008	Draft - Calexico Mega Park - Environmental Impact Report	Approximately 0.95 mile east
IM-01239	Tang, Bai and Michael Hogan	2007	Historical/Archaeological Resources Survey Report - World Meridian Project, Assessor's Parcel No. 054-024-02, near the Community of Heber, Imperial County, California	Adjacent to northeast

Report Number	Author	Year	Title	Proximity to Project Site
IM-01306	Wirth Associates, Inc	1980	APS/SDG&E Interconnection Project Environmental Study Phase II Corridor Studies - Native American Cultural Resources Appendices	Approximately 0.7 mile south
IM-01313	Wirth Associates, Inc	1980	APS/SDG&E Interconnection Project (Phase II Corridor Studies) - Cultural Resources: Archaeology	Approximately 0.9 mile south
IM-01727	Roberts, Ted, and Lauren DeOliveira	2019	Phase I Cultural Resources Report for the Heber 1 Expansion Project, Imperial County, California	Approximately 0.9 mile south

Source: SCIC, March 2021

4.1.2 Previously Recorded Resources

Two cultural resources are previously recorded within one mile of the project site (Table 2). Neither of these resources is within or adjacent to the project site. Both resources are historic built environment: the Niland to Calexico Railroad and the Alder Canal. Neither resource appears to have been evaluated for NRHP or CRHR listing.

Table 2. Previously Recorded Cultural Resources within One-Mile of the Project Site

Primary Number	Trinomial	Description	NRHP/CRHR Eligibility Status	Recorded Year (By Whom)	Proximity to Project Site
P-13-008682	CA-IMP-008166	Niland to Calexico Railroad	Insufficient information	2011 (C. Ehringer); 2009 (IVC Museum); 2005 (Craft and Wise); 2003 (K. Collins)	Approximately 0.5-mile west
P-13-009015		Alder Canal	Insufficient information	2009 (C. Dolan and J. Toenjes, EDAW, Inc.)	Approximately 0.5-mile north

Source: SCIC, March 2021

4.2 Final Program EIR for the County of Imperial General Plan

In Section III, F (Environmental Analysis, Cultural Resources) this EIR includes a discussion and figure on the distribution and sensitivity of prehistoric archaeological resources in Imperial County (County of Imperial 1993: III-144 through III-147). This section states "...the intensive use of Imperial Valley for irrigation agriculture since the beginning of this [twentieth] century has impacted any resources that may have existed on land that is now farmland or under the Salton Sea." The Sensitivity Map for Cultural Resources shows the project APE within an area labeled "zero to rare."

4.3 Historic Period Maps

Anza reviewed historic period topographical maps online to confirm the APE's land use history. Maps reviewed in include the 2012 U.S. Geological Survey (USGS) *Heber, California* (1:24,000), which showed State Route 86 (SR 86), Pitzer Road, and the Daffodil Canal; 1957 U.S. Geological Survey (USGS) *Heber, California* (1:24,000 which showed U.S. Highway 99 (now SR 86), the Pitzer Road alignment, one building

on the southeast corner of the intersection, and the Daffodil Canal; 1943 *Heber, California* (1:62,500), which showed U.S. Highway 99, the Pitzer Road alignment, no buildings at the intersection, and the Daffodil Canal; 1940 *Heber, California* (1:62,500), which showed U.S. Highway 99, the Pitzer Road alignment, no buildings at the intersection, and the Daffodil Canal; and 1915 *El Centro, California* (1:125,000), which was unclear in the project vicinity but shows a canal in the location of the Daffodil Canal. A 1953 aerial photograph depicts U.S. Highway 99 paved, a dirt road in the Pitzer Road alignment, and the Daffodil Canal is visible (Historicaerials.com 2021).

4.4 Native American Scoping

Anza requested a review of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) on February 23, 2021. The NAHC sent a response on March 9, 2021, stating that a search of the SLF was completed with positive results (i.e., sacred lands or resources important to Native Americans are recorded within the vicinity of the project APE; Attachment B). The letter recommended that Anza contact the Torres-Martinez Desert Cahuilla Indians and the Ewiiaapaayp Band of Kumeyaay Indians for more information.

On March 9, 2021, Anza mailed letters to the NAHC-listed contacts describing the project and asking if they had knowledge regarding cultural resources of Native American origin within or near the APE (Attachment B). Anza also emailed the letter to Cultural Resources Director Michael Mirelez of the Torres-Martinez Desert Cahuilla Indians and Chairperson Robert Pinto of the Ewiiaapaayp Band of Kumeyaay Indians on March 9, 2021, to encourage dialogue.

On March 17, 2021, Quechan Indian Tribe Historic Preservation Officer H. Jill McCormick responding via email stating that the tribe had no comments regarding the project.

On March 17, 2021, Anza sent emails to remaining contacts with copies of the letters attached and providing an additional opportunity to comment or ask questions regarding the proposed undertaking.

On April 14, 2021, the Viejas Band of Kumeyaay Indians (Viejas) responded via email. Viejas stated that the project site has cultural significance or ties to Viejas and "cultural resources have been located within or adjacent to the APE-DE of the proposed project." Viejas requested that a Kumeyaay cultural monitor be on site for ground disturbing activities and to inform them of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. Viejas also stated that if a tribe closer to the project site requests to provide Native American monitoring Viejas would defer to them.

No responses have been received as of June 1, 2021. All Native American scoping correspondence is presented in Attachment B.

5. FIELDWORK

5.1.1 Survey Methods

On March 10, 2021, Anza Principal and Senior Cultural Resources Specialist Kevin Hunt conducted a pedestrian survey of the project APE. Transects were spaced five meters apart and oriented east-west along SR 86 and north-south on Pitzer Road. Mr. Hunt examined all areas of exposed ground surface for prehistoric artifacts (e.g., chipped stone tools and production debris, stone milling tools, ceramics), historic debris (e.g., metal, glass, ceramics), or soil discoloration that might indicate the presence of a cultural midden. Mr. Hunt recorded the characteristics of the project APE and survey conditions using a notepad and digital camera. Copies of the field notes and digital photographs are digitally stored online.

5.1.2 Results

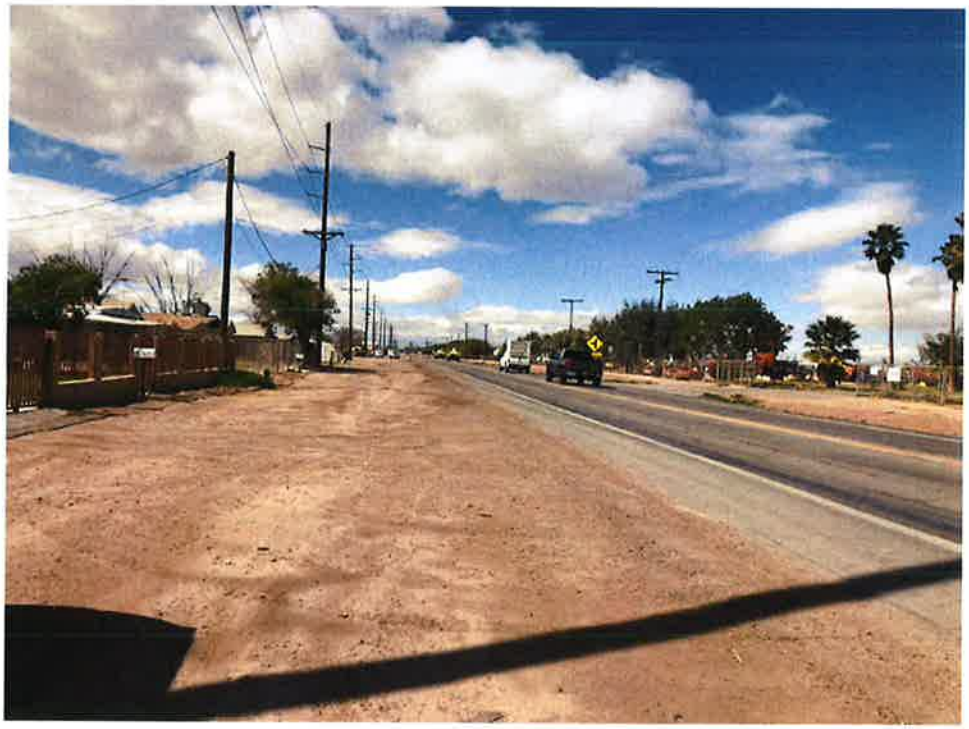
The project site is nearly entirely within County of Imperial/Caltrans right-of-way, except a portion at the northwest corner of the intersection that impinges on the Daffodil Canal and possibly private property. SR 86 and Pitzer Road are both paved in asphalt, with bare dirt or gravel covered shoulders resulting in the project site being approximately 50 percent paved (Photographs 1-4). Exposed sediments observed were light to medium brown silt, with some imported gravel. Ground visibility within the unpaved portions of the APE was good to excellent (between 90-100 percent), with occasional disturbed grasses, weeds, and infrequent patches of gravel the only limitations. The New Holland Agriculture Tractor Supply is to the northwest of the project site intersection. Single-family residences are to the southwest of the intersection. The Daffodil Canal and agricultural fields are to the east of the intersection.

The cultural resources survey was negative for archaeological resources. One historic built environment resource, the Daffodil Canal, was identified within the project site and is discussed in the next section (Photographs 5-6).

Photograph 1. View of northeast side of project site from SR 86, facing west.

Photograph 2. View of project site from Pitzer Road, facing southeast.

Photograph 3. View of northwest portion of project site on Pitzer Road, facing west.



Photograph 4. View of southwest portion of project site on Pitzer Road, facing west.

Photograph 5. View of Daffodil Canal, north side of project site, facing north.

Photograph 6. View of Daffodil Canal, south side of project site, facing south.

6. DISCUSSION

One historic period resource, the Daffodil Canal, was identified within the project site during the survey. Despite at least seven previous cultural resources studies that included at least portions of the canal, this resource was not previously recorded and does not appear to have been previously evaluated for CRHR or NRHP eligibility. The Daffodil Canal is discussed below and State of California Department of Parks and Recreation Series 520 forms are presented in Appendix C.

6.1 DAFFODIL CANAL

As described in Section 3.1.2, the Daffodil Canal is a part of the All-American Canal system that provides irrigation and drainage for Imperial Valley agriculture, as well as drinking water. The Daffodil Canal pre-dates the All-American Canal and is visible on the 1915 *El Centro, California* (1:125,000) USGS map, presumably constructed as part of the distribution system originally fed by the Alamo Canal, which was completed in 1901. The Daffodil Canal is visible on the 1906 *Reconnaissance Map of the Salton Sink California* (1:500,000) produced by USGS (Douglas et al. 1906).

The Daffodil Canal is earth-lined and has wood and steel gates with concrete walls (Photographs 5 and 6). The canal is approximately 24 feet wide, with some variation due to erosion, road crossings, and gates. The canal is piped under SR 86 and runs south to north on the east side of Pitzer Road in the vicinity of the project.

Anza Resource Consultants inspected an approximately 0.17-mile-long segment of the Daffodil Canal. Complete recordation of this resource was beyond the scope of the current project, but some assessments can be made based on field inspection and historic map and literature review. The Daffodil Canal was most likely completed in 1902, based on historic maps and the stated acreage of irrigated lands in 1902 provided by Dowd (1956). Its original length is difficult to determine but all available imagery shows the Daffodil Canal originating at the Central Main Canal at Jasper Road and Pitzer Road and continuing north of the current project site. The 1940 (1955 ed.) and 1943 (1945 ed.) *Brawley, CA* 1:62,500-scale maps depict the Daffodil Canal continuing north from Heber through El Centro to approximately halfway between El Centro and Imperial. Since at least 1957, the Daffodil Canal becomes the Heber Drain near the center of Section 16. The Heber Drain currently terminates just south of Interstate 8 near El Centro.

The Built Environment Resource Directory (BERD) for Imperial County (Office of Historic Preservation 2021) does not list the Daffodil Canal or the greater All-American Canal System a resource; however, the Westside Main Canal is listed as constructed in 1902 and NRHP Status Code 2S2: Individual property determined eligible for NR[HP] by a consensus through Section 106 process. Listed in the CR[HR]. The Dogwood Canal, which runs parallel to and approximately one mile west of the Daffodil Canal in the vicinity of the project, is also identified as Status Code 2S2 in the BERD.

The All-American Canal (AAC) was evaluated for NRHP/CRHR eligibility as part of IID and the Bureau of Reclamation's (2002) "Imperial Irrigation District Water Conservation and Transfer Project and Draft Habitat Conservation Plan Draft Environmental Impact Report/Environmental Impact Statement." IID and Bureau of Reclamation found the AAC eligible for listing on the NRHP and CRHR under Status Code 3D: Appears eligible for NR as a contributor to a NR eligible district through survey evaluation (California Office of Historic Preservation 2003).

7. CRHR ELIGIBILITY EVALUATION AND IMPACT ASSESSMENT

This section describes the application of CRHR eligibility criteria, as detailed in Section 1.2.1., and potential project related impacts to CRHR eligible or listed resources.

7.1 DAFFODIL CANAL CRHR ELIGIBILITY EVALUATION

The Daffodil Canal is part of the All-American Canal system via the Central Main Canal, and prior to that was part of the Alamo Canal system that began large-scale irrigation of Imperial County. The reliable distribution of water for drinking and irrigation was the single greatest factor for the development and growth of Imperial County from circa 1900 until today. As such, the Daffodil Canal meets CRHR Criterion 1 for its contribution to events important in California and national history as part of the All-American Canal System. . The All-American Canal has been previously evaluated and recommended NRHP eligible as a contributor to an NRHP-eligible (and therefore CRHR-eligible) district (Status Code 3D). There is no individual wholly responsible or singularly identified with the creation of the canal system and the Daffodil Canal does not meet CRHR Criterion 2. Instead, this development was accomplished through multiple private and local and federal governmental efforts, with interests that mostly aligned. The Daffodil Canal is a simple earth-lined, concrete and wood-gated, gravity-fed canal with no special construction methods or features. The Daffodil Canal does not embody the distinctive characteristics of a type, period, or method of construction, nor represent the work of a master, and it does not meet CRHR Criterion 3. The Daffodil Canal retains no significant data potential and does not meet CRHR Criterion 4. The Daffodil Canal appears CRHR eligible under Criterion 1 as a contributor to a CRHR-eligible district (Status Code 3D), the All-American Canal system.

Anza Resource Consultants inspected an approximately 0.17-mile-long segment of the Daffodil Canal. Complete recordation of this resource was beyond the scope of the current project. However, the analysis completed was sufficient to recognize the Daffodil Canal as part of the NRHP/CRHR-eligible All-American Canal system and demonstrate its eligibility under CRHR Criterion 1.

7.2 IMPACT ASSESSMENT

The Daffodil Canal is recommended eligible for CRHR listing as a contributor to a historic district (Status Code 3D). Its CRHR-eligibility is based on its association with the All-American Canal system and the development of Imperial County, an important event in history (Criterion 1). The construction would encroach the Daffodil Canal, like requiring northward extension of the piped segment under SR 86 as much as 50 feet. The gate may or may not also require relocation. The proposed impact would not cause an adverse change to the significance of the resource. As such, project related impacts to this resource would be less than significant. The Daffodil Canal will continue serving its intended function as it has since its construction and the continued operation, maintenance, and upgrades to this resource only further reinforce its importance in the agricultural development of Imperial County.

8. MANAGEMENT RECOMMENDATIONS

The cultural resource records search, Native American scoping, and pedestrian survey identified one CRHR-eligible historic built environment resource within the project site: the Daffodil Canal. This resource has been recommended CRHR-eligible as a contributor to a historic district but project-related impacts to this resource would be less than significant. No further cultural resources work is recommended for this resource.

The cultural resource records search, Native American scoping, and pedestrian survey identified no specific archaeological or Native American resources within or adjacent to the project site and the County of Imperial has identified the area as "zero-to-rare" with regard to prehistoric archaeological sensitivity (see Section 4.2). The Viejas Band of Kumeyaay Indians has identified the project site is within the vicinity of important Native American resources but no additional information has been provided. Anza assumes that government-to-government consultation under AB 52 could further clarify Viejas's position. The project site is heavily disturbed by construction of the existing roads and canal. Based on these results, the archaeological sensitivity of the project site is considered low.

Anza recommends a finding of ***no impacts to archaeological resources*** and **less than significant impacts to historical resources** under CEQA. No further cultural resources study is recommended; however, the following standard measures are recommended to avoid potential impacts from the unanticipated discovery of cultural resources during project related ground disturbing activities.

8.1 UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES

If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of the Interior's Historic Preservation Professional Qualification Standards for archaeology (National Park Service 1997), as appropriate must be contacted immediately to evaluate the find in accordance with CEQA. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation may be warranted.

8.2 UNANTICIPATED DISCOVERY OF HUMAN REMAINS

The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a Most Likely Descendant. The Most Likely Descendant shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

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Moratto, Michael J.

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National Park Service

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Pourade, Richard F.

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Singer, Eugene

n.d. "Ancient Lake Cahuilla." Excerpted from *Geology of the Imperial Valley, a Monograph by Eugene Singer*. Electronic document accessed August 27, 2019, at: http://www.sci.sdsu.edu/salton/AncientLakeCahuilla.html.

Appendix A:
Records Search Summary

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
nick@scic.org

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Company: Anza Resource Consultants

Company Representative: Kevin Hunt

Date Processed: 2/25/2021

Project Identification: Heber Meadows Subdivision and SR 86 and Pitzer Rd Intersection

Search Radius: 1 mile

Historical Resources: JL

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: JL

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: JL

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: N/A

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of SHRC Approved CHRIS IC Records Search Elements	
RSID:	2851
RUSH:	no
Hours:	1.5
Spatial Features:	25
Address-Mapped Shapes:	no
Digital Database Records:	32
Quads:	1
Aerial Photos:	0
PDFs:	Yes
PDF Pages:	1418

This is not an invoice. Please pay from the monthly billing statement

Appendix B:
Native American Scoping

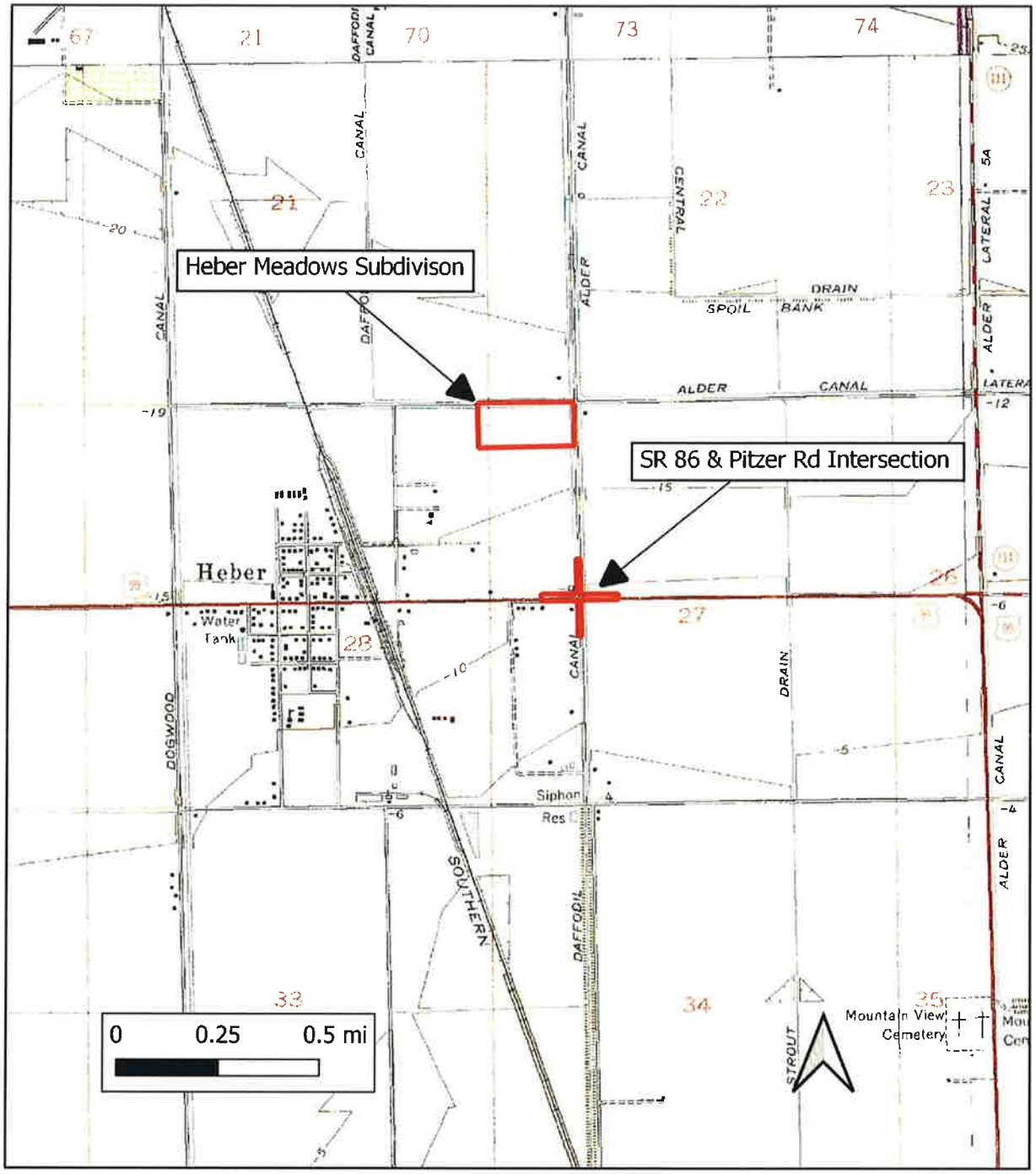
Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100 West Sacramento, CA 95691
916-373-3710 916-373-5471 – Fax nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project
County: Imperial
USGS Quadrangle Name: Heber, CA
Township: 16S Range: 14E Section(s): 27 and 28
Company/Firm/Agency: Anza Resource Consultants
Street Address: 603 Seagaze Dr. #1018
City: Oceanside Zip: 92054
Phone: 760-207-9736
Fax: N/A
Email: kevin@anzaresourceconsultants.com
Date: 2/23/2021

Project Description:
The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to CEQA and the County of Imperial is the lead CEQA agency.



Heber, CA

Project Location Map

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

March 9, 2021

Kevin Hunt
Anza Resource Consultants

Via Email to: kevin@anzaresourceconsultants.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Heber Meadows Subdivision and SR 86 Pitzer Rd Intersection Improvement Project, Imperial County

Dear Mr. Hunt:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

      All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was positive. Please contact the Ewiiaapaayp Band of Kumeyaay Indians and the Torres-Martinez Desert Cahuilla Indians on the attached list for more information.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Imperial County
3/9/2021

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Diegueno
Pine Valley, CA, 91962 — Kwaaymii
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County.

Native American Heritage Commission
Tribal Consultation List
Imperial County
3/9/2021

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com
Diegueno

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com
Quechan

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org
Diegueno

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov
Kumeyaay

Torres-Martinez Desert Cahuilla Indians
Thomas Tortez, Chairperson
P.O. Box 1160
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
tmchair@torresmartinez.org
Cahuilla

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
Diegueno

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This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County.

RESOURCE CONSULTANTS

March 9, 2021

Barona Group of the CapitanGrande
Edwin Romero, Chairperson
1095 Barona Road
Lakeside, CA, 92040

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Romero:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

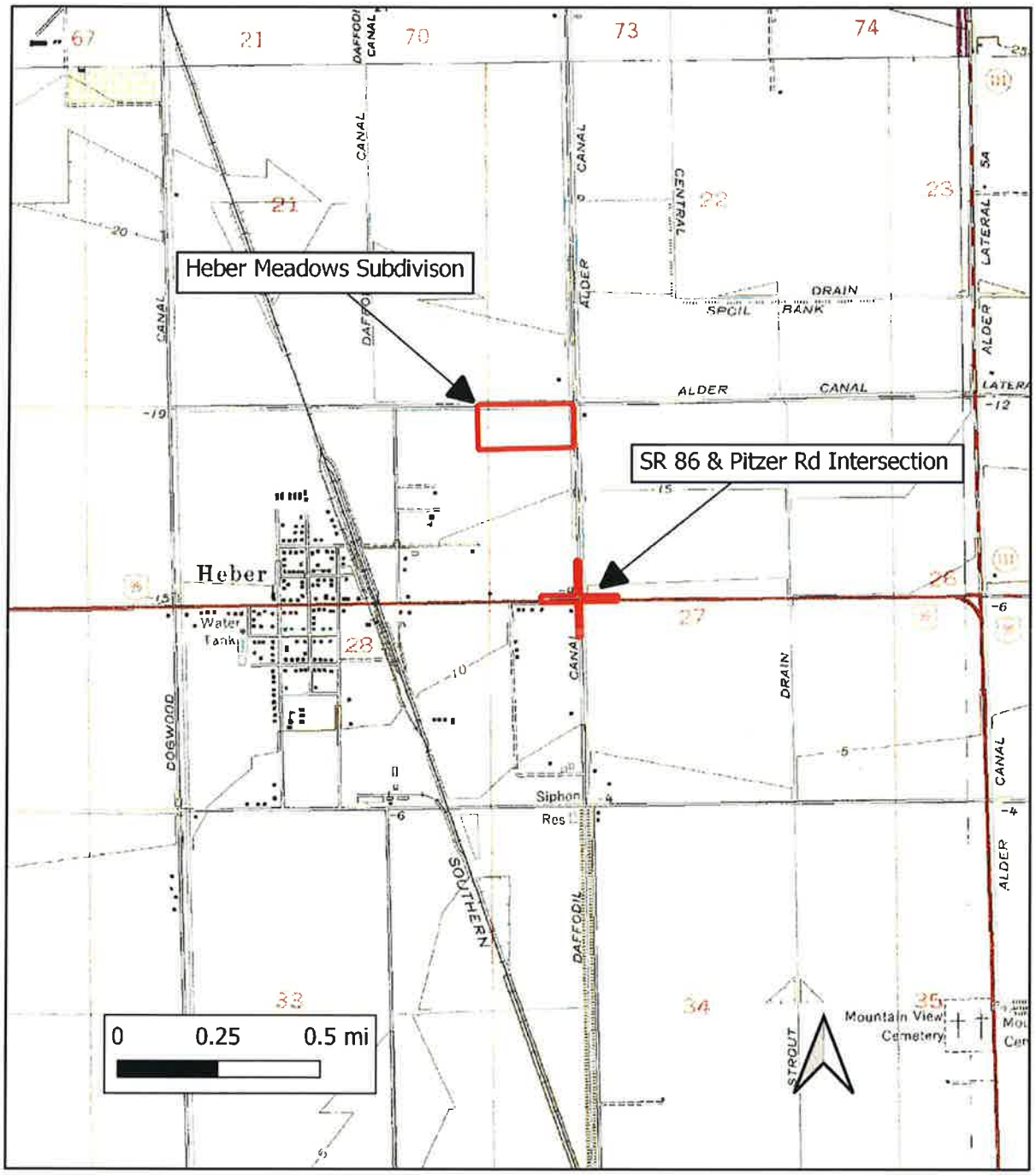
As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

March 9, 2021

Manzanita Band of Kumeyaay Indians
Angela Elliott Santos, Chairperson
PO Box 1302
Boulevard, CA 91905-1302

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Santos:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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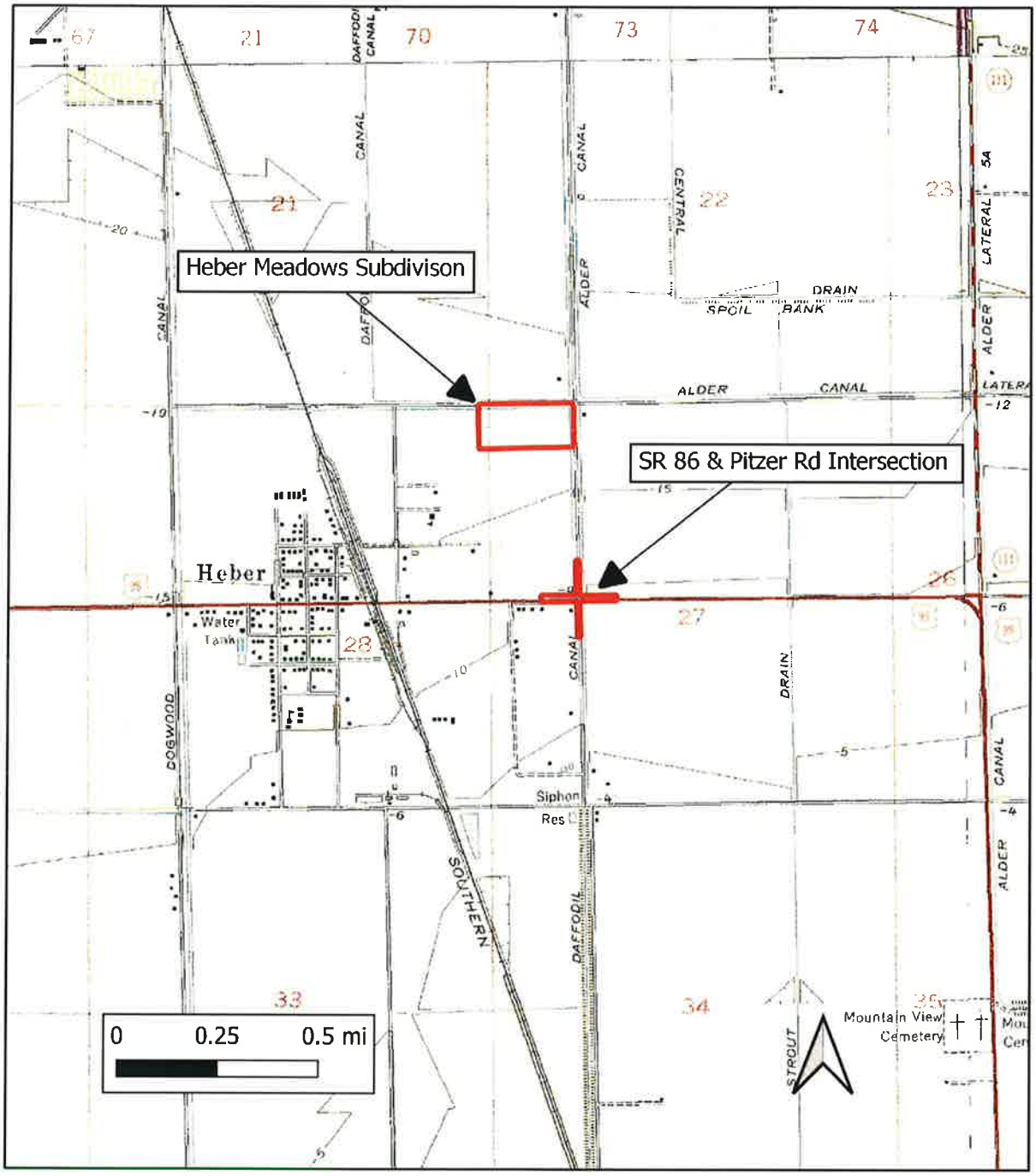
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

RESOURCE CONSULTANTS

March 9, 2021

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1
Campo, CA, 91906

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Goff:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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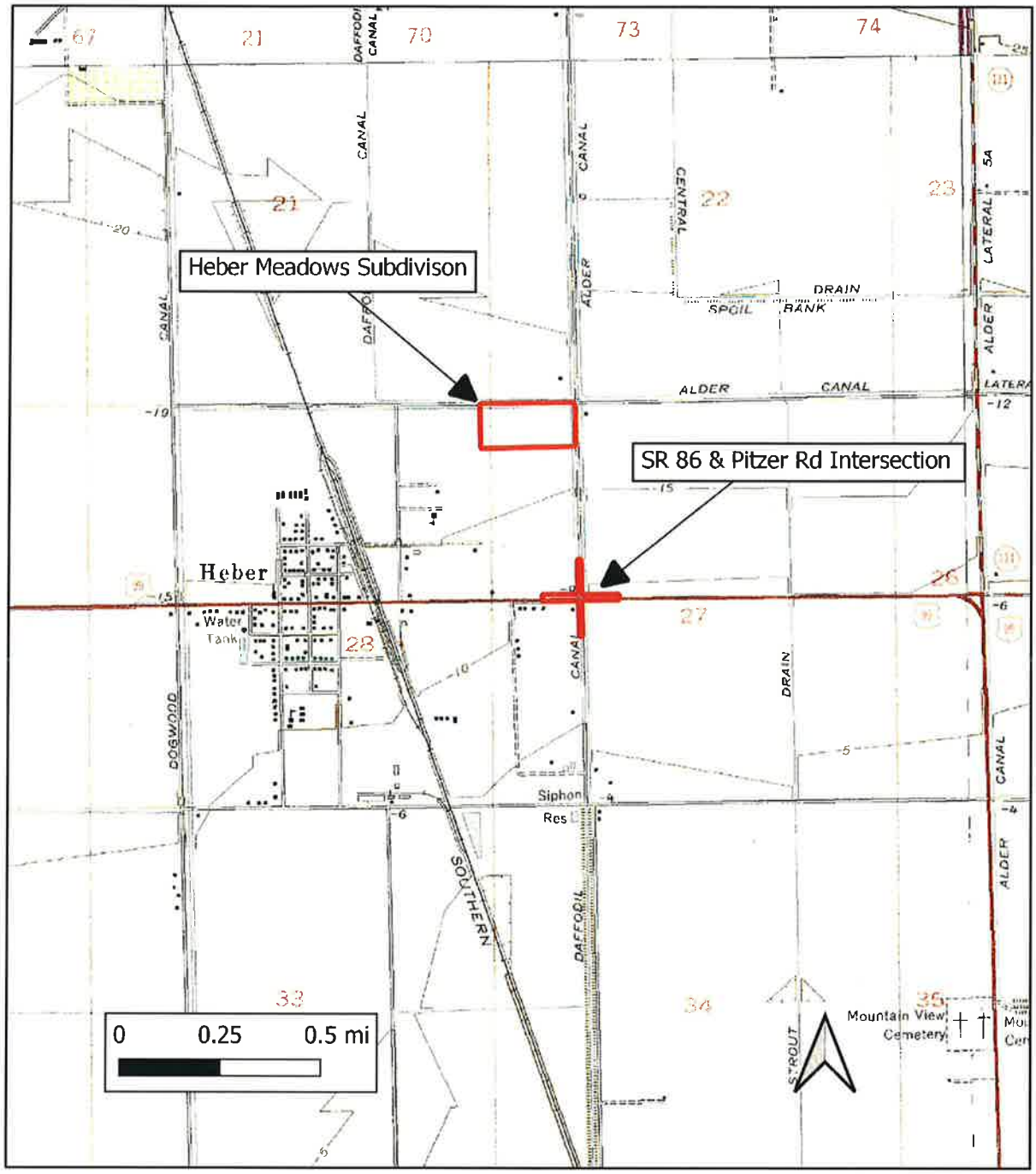

Project Location Map *Heber, CA*

anza

RESOURCE CONSULTANTS

March 9, 2021

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
PO Box 365
Valley Center, CA 92082-0365

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Lawson:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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603 Seagaze Dr. #1018
Oceanside, CA 92054

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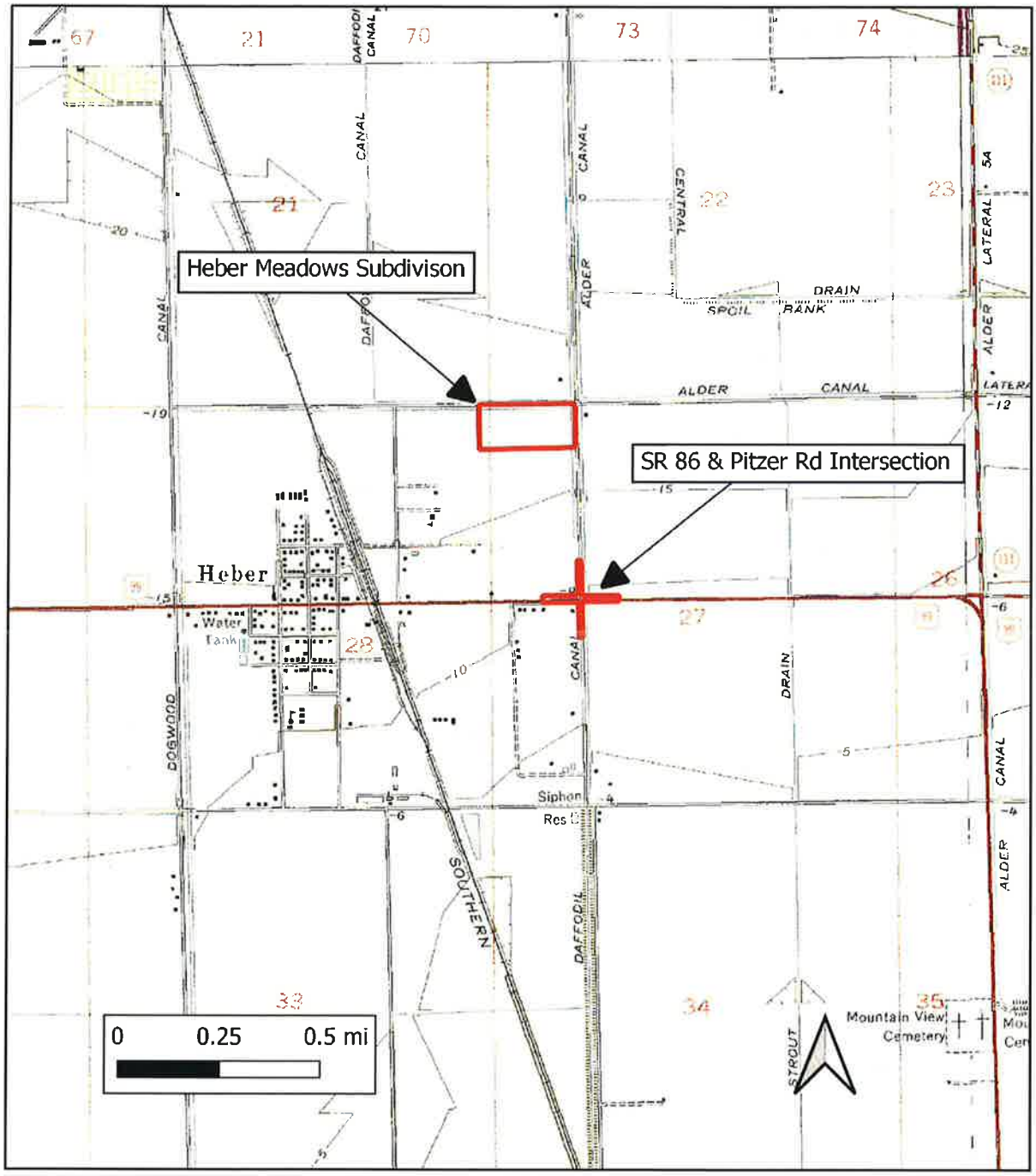

Project Location Map *Heber, CA*

anza

RESOURCE CONSULTANTS

March 9, 2020

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road
Alpine, CA, 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Vice Chairperson Garcia:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Oceanside, CA 92054

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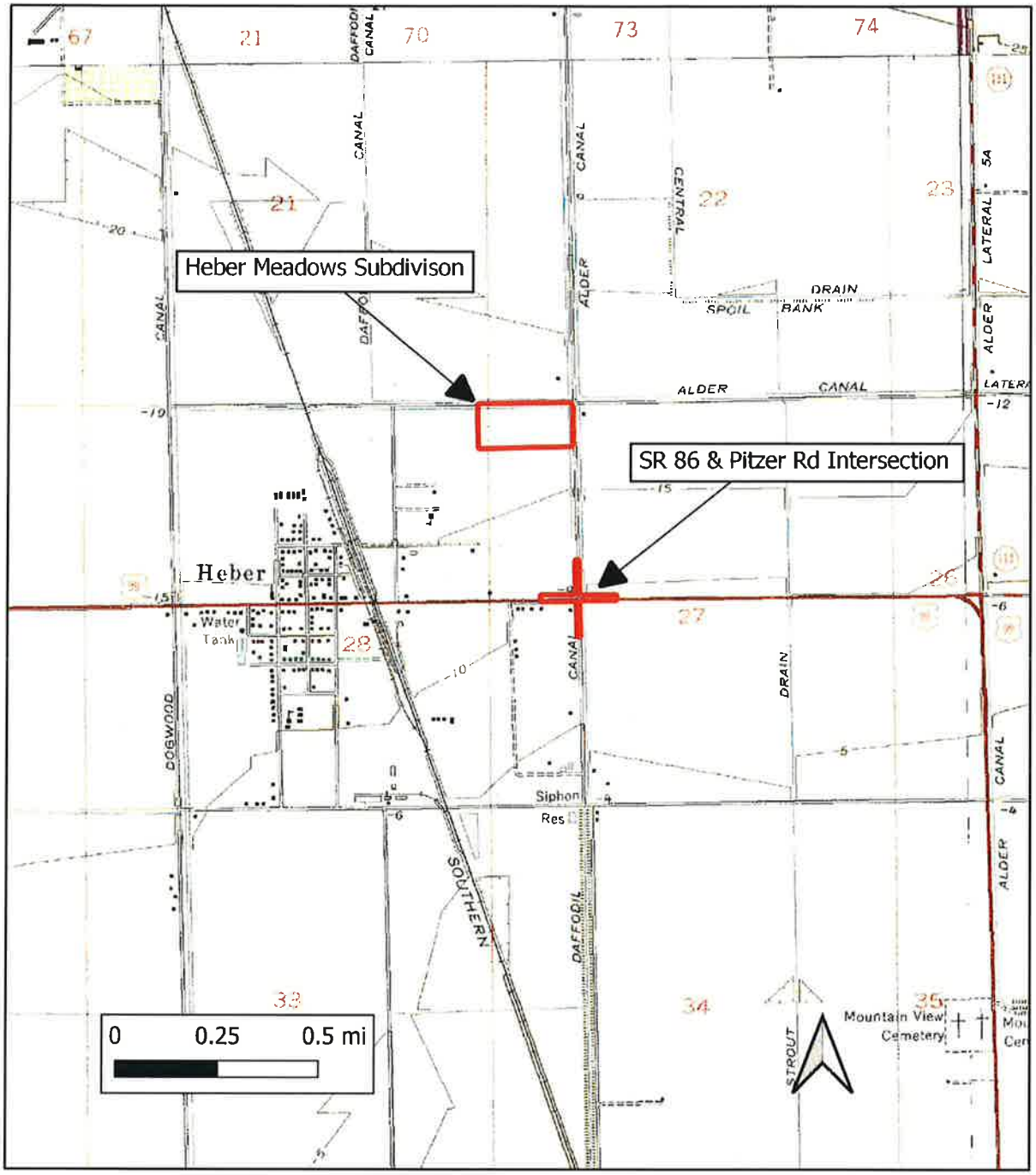

Project Location Map *Heber, CA*

anza

March 9, 2021

Ewiiaapaayp Band of Kumeyaay Indians, California
Robert Pinto, Chairperson
4054 Willows Road
Alpine, CA 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Pinto:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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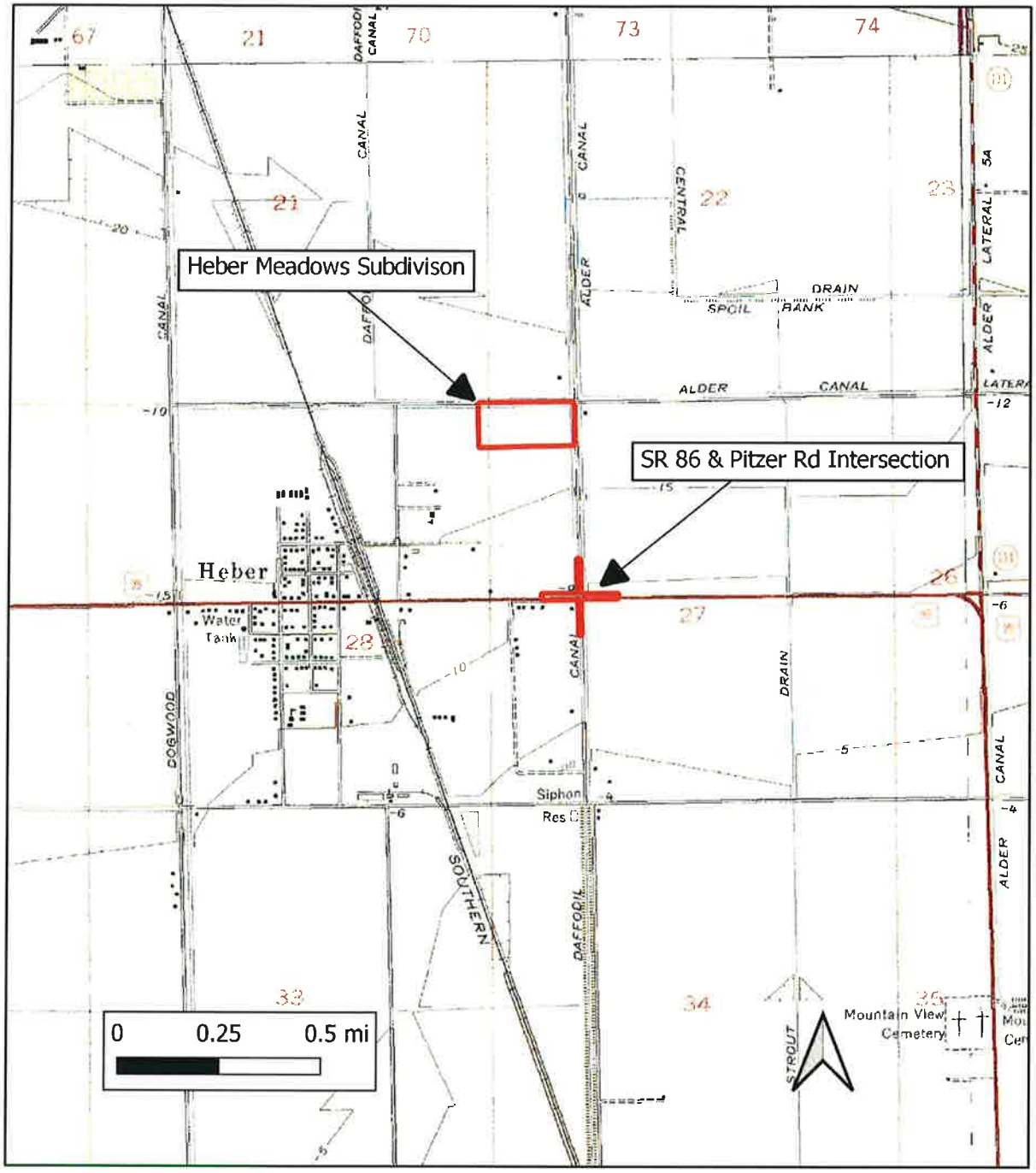

Project Location Map

Heber, CA

anza

March 9, 2021

Quechan Tribe of the Fort Yuma Indian Reservation
Jill McCormick, M.A., Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear HPO McCormick:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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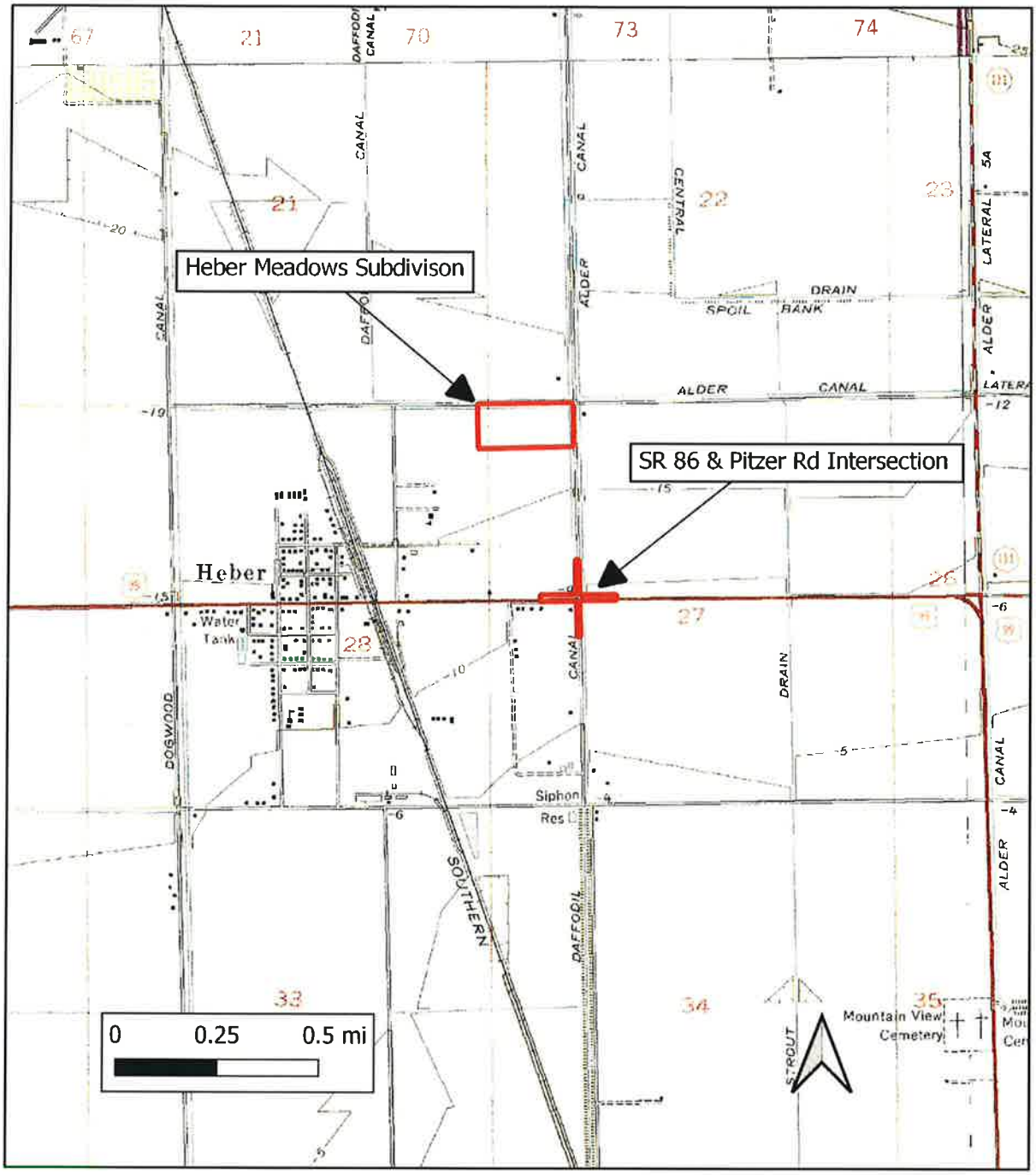
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130
Santa Ysabel, CA, 92070

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Perez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

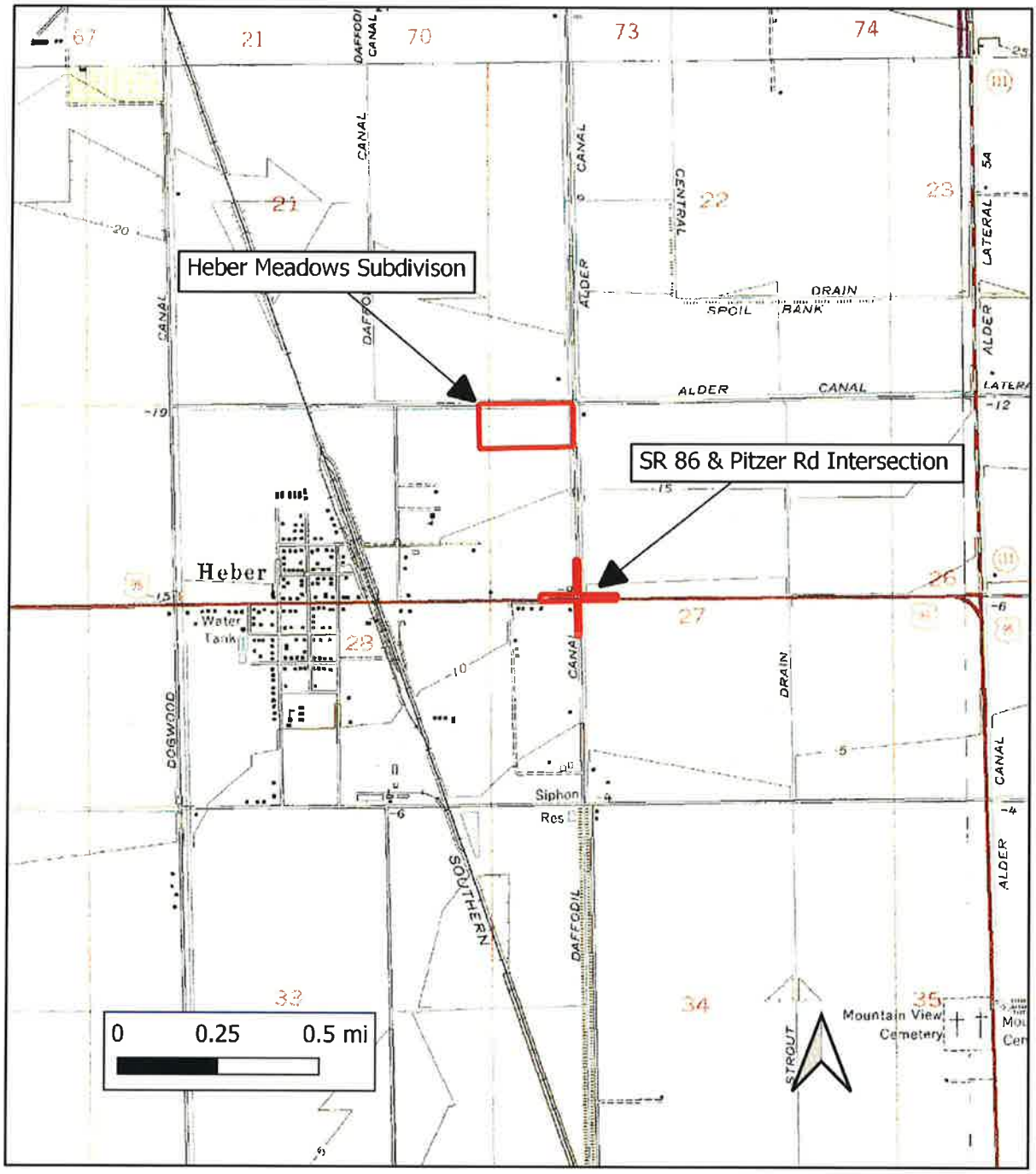
As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd.
Escondido, CA, 92025

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Osuna:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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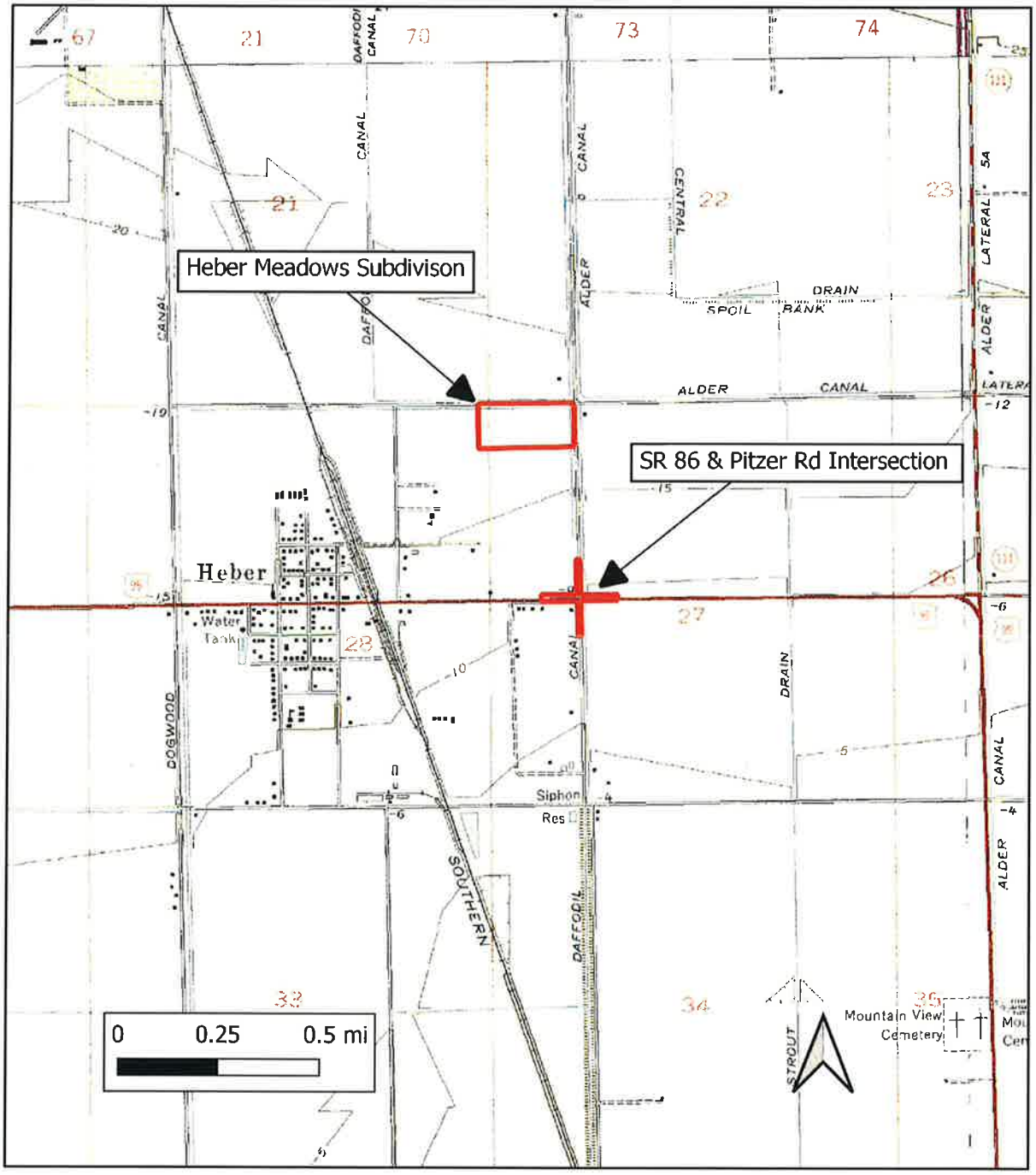

Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2021

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612
Jamul, CA, 91935

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Pinto:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

As part of the process of identifying cultural resources issues for this project, Anza contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project area. The Sacred Lands File search was positive (i.e., sacred lands or resources important to Native Americans are within the vicinity of the project).

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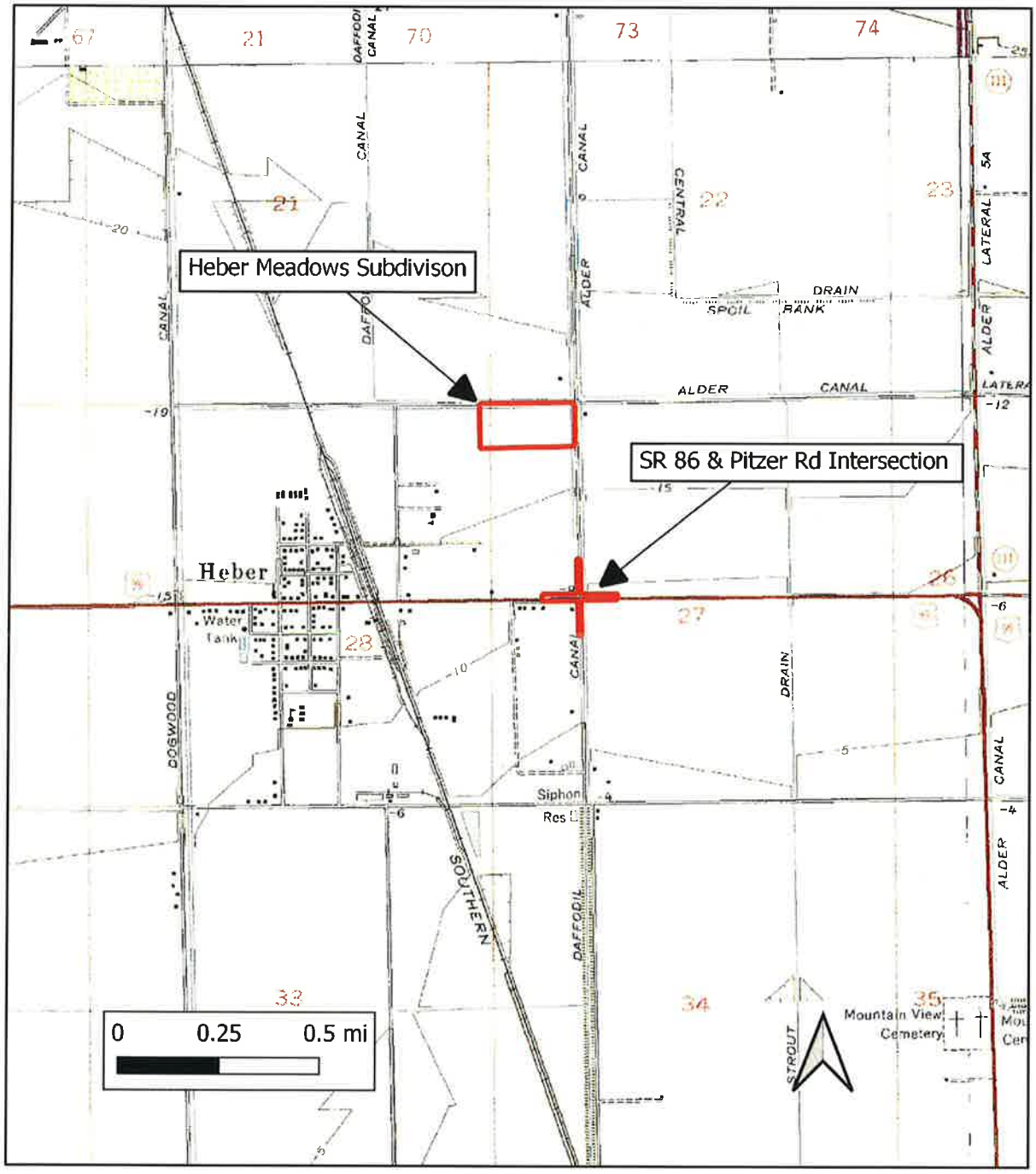
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612
Jamul, CA, 91935

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear THPO Cumper:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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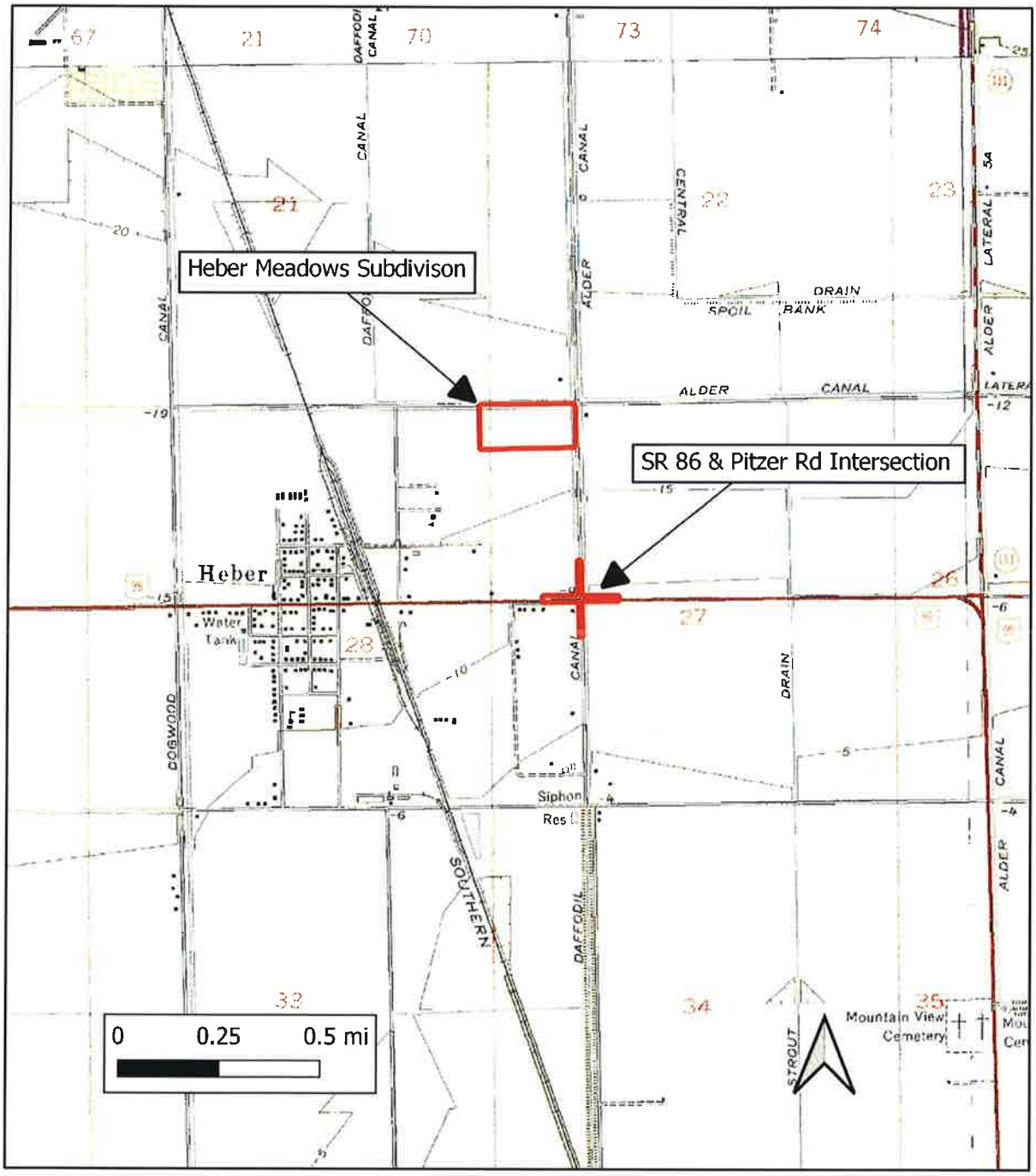
Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775
Pine Valley, CA, 91962

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Ms. Lucas:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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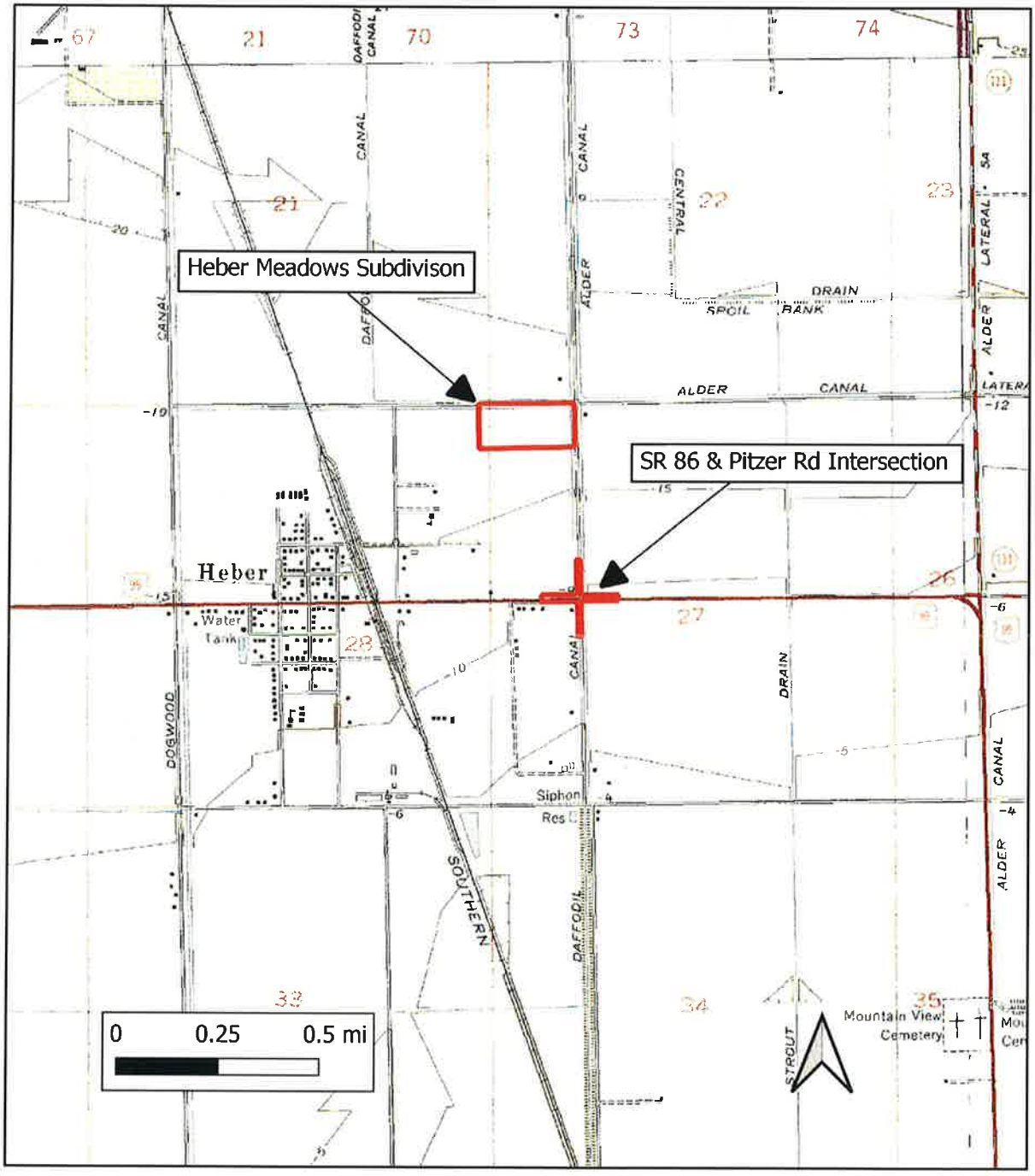
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road
Boulevard, CA, 91905

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Parada:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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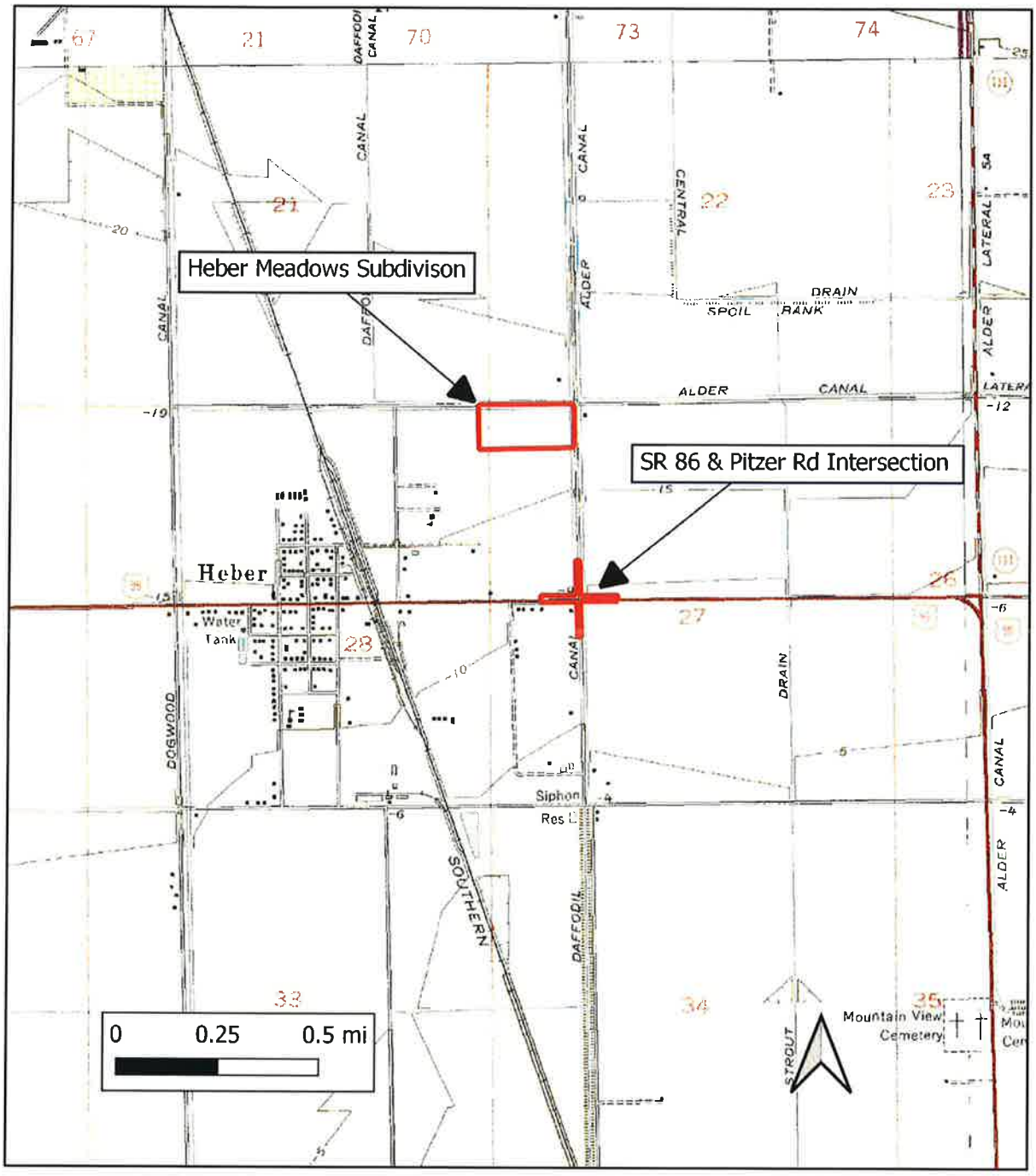
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road
Boulevard, CA, 91905

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Administrator Miller:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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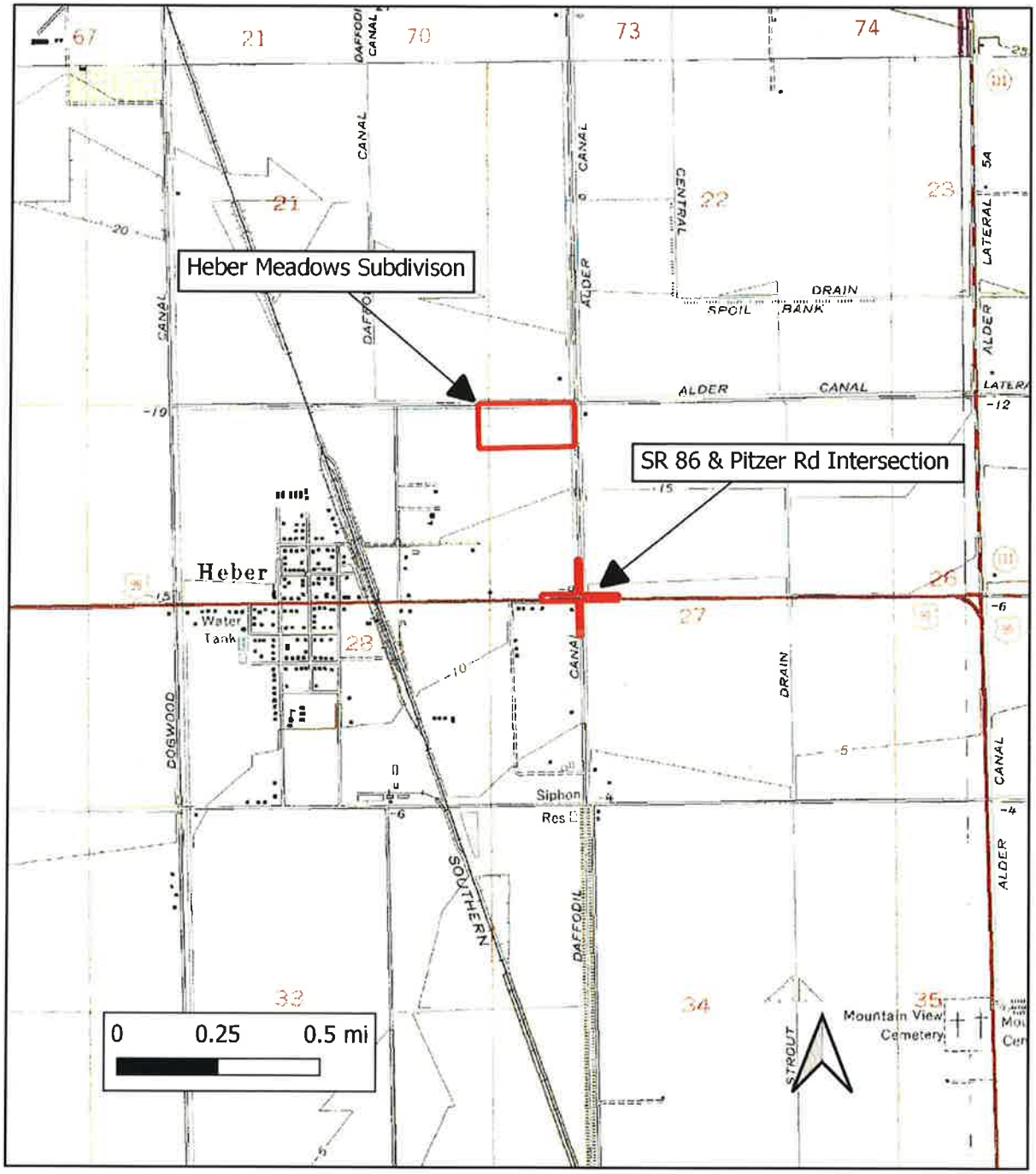
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

March 9, 2021

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270
Santa Ysabel, CA, 92070

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Linton:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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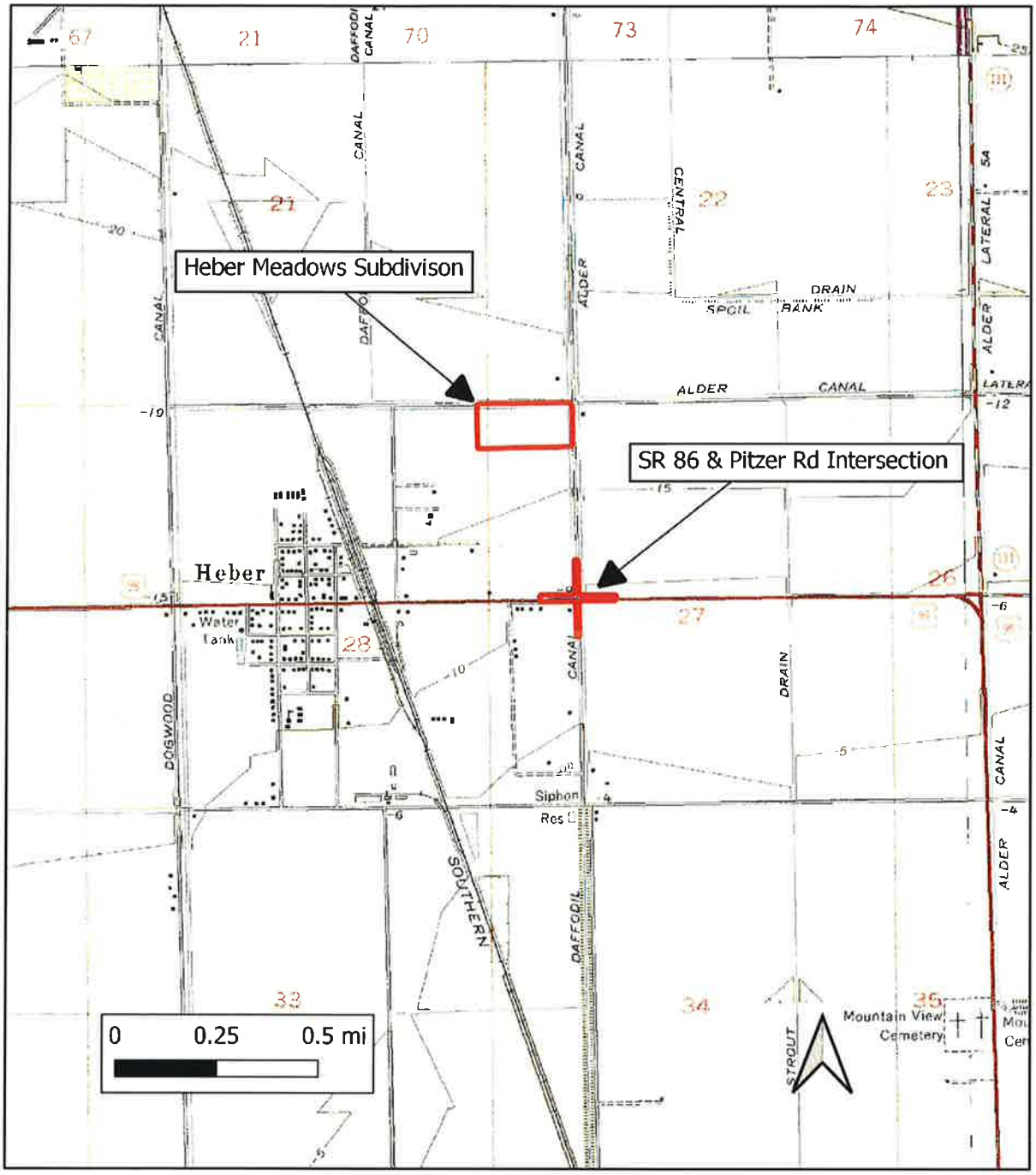
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

RESOURCE CONSULTANTS

March 9, 2021

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA, 92019

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Martinez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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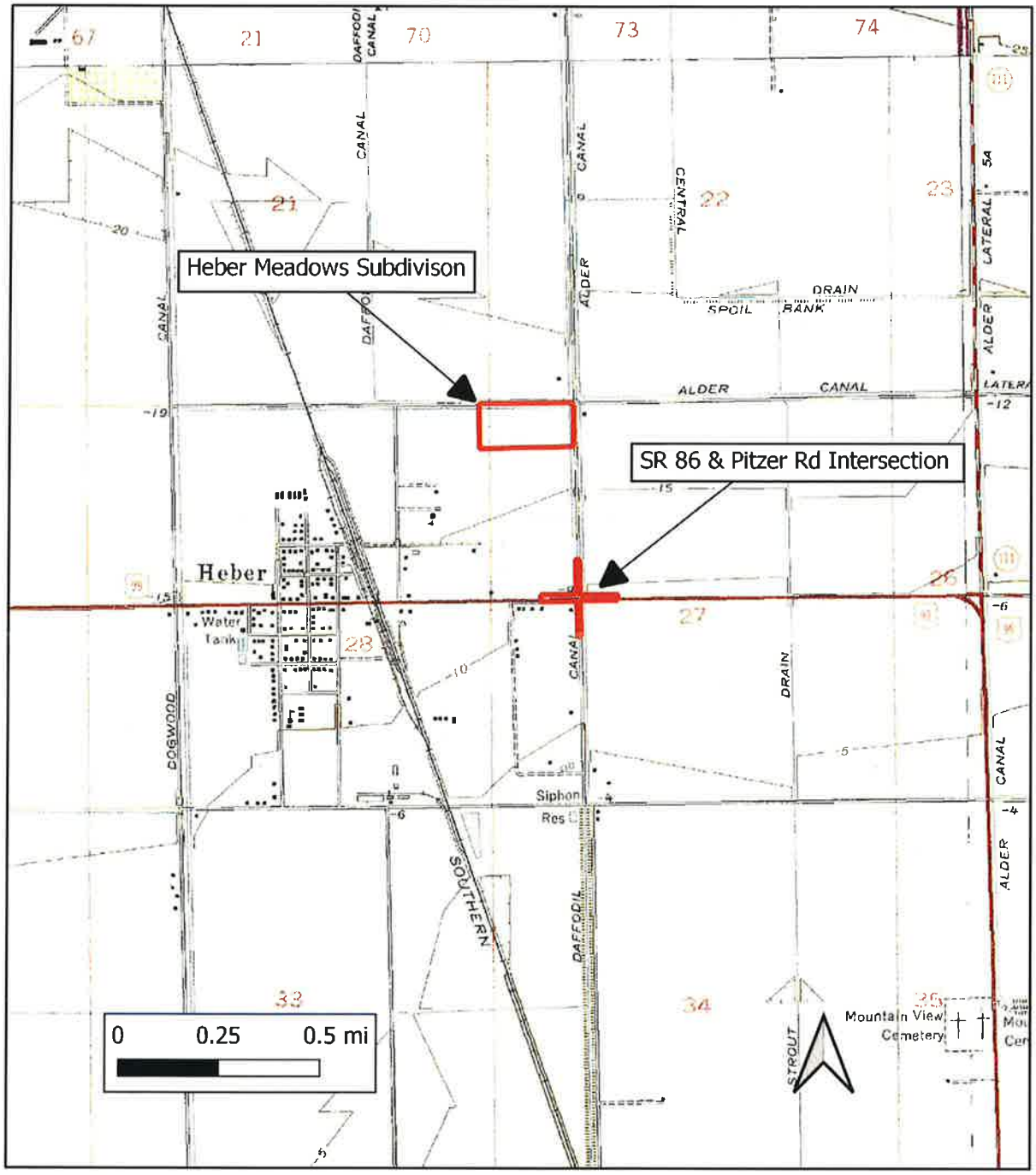
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map

Heber, CA

anza

RESOURCE CONSULTANTS

March 9, 2021

Torres-Martinez Desert Cahuilla Indians
Thomas Tortez, Chairperson
P.O. Box 1160
Thermal, CA, 92274

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Tortez:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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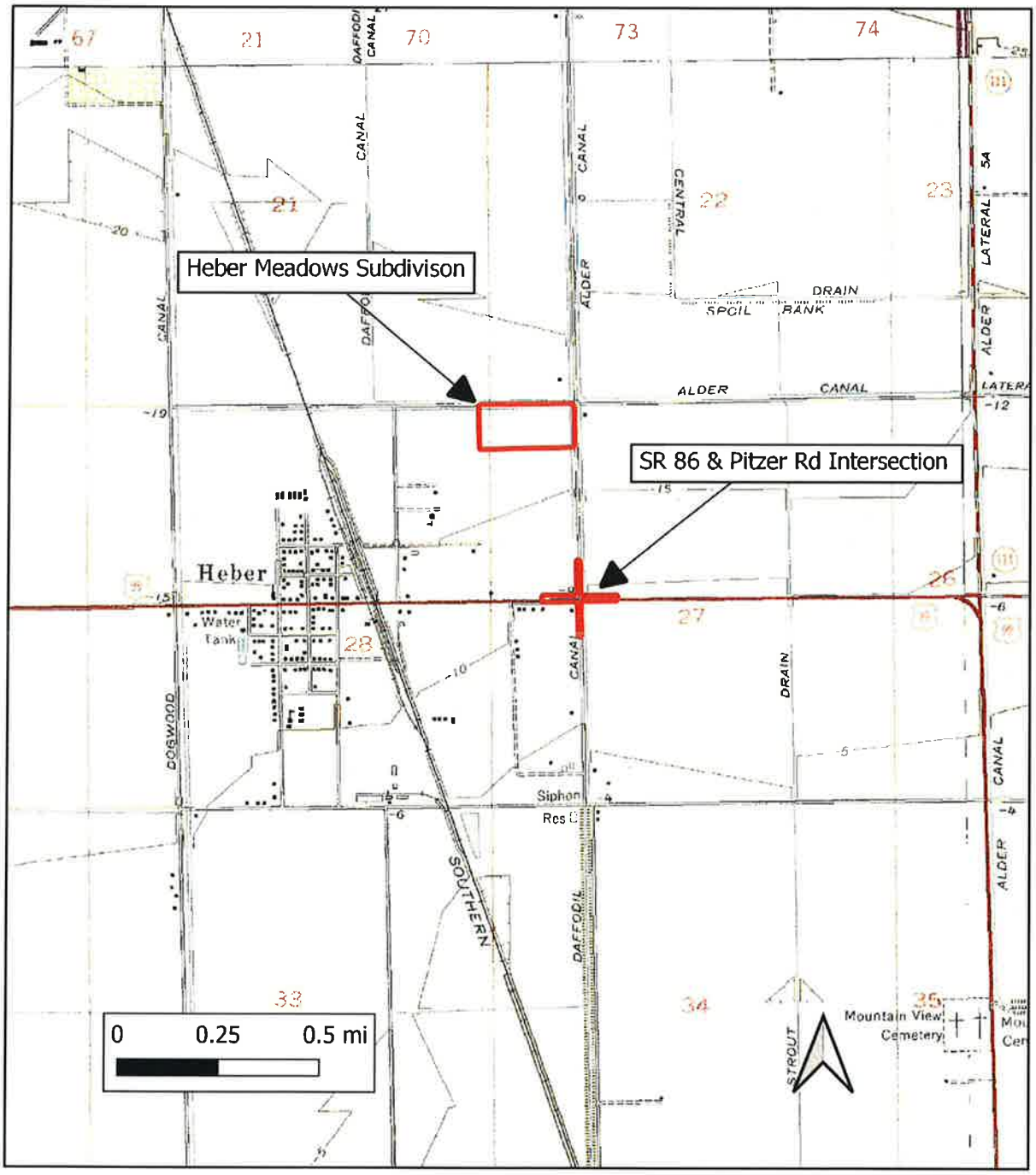
If you have knowledge of cultural resources that may exist within or near the project area, please contact me at kevin@anzaresourceconsultants.com or by telephone at (760) 207-9736. Thank you for your assistance.

Sincerely,

Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

Enclosure: Project Location Map



Project Location Map *Heber, CA*

anza

March 9, 2021

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road
Alpine, CA, 91901

RE: Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project, Imperial County, California

Dear Chairperson Christman:

Anza Resource Consultants (Anza) has been retained to prepare a cultural resources study for the Heber Meadows Subdivision and SR 86 & Pitzer Rd Intersection Improvement Project (project; see attached figure). The proposed project entails the subdivision of 16.22 acres at 185 Willowbrook Way (APN 054-601-016-000) for future development, and the associated improvement of the intersection of State Route 86 and Pitzer Road. The project is subject to the California Environmental Quality Act (CEQA) and the County of Imperial is the lead CEQA agency.

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Kevin Hunt, Principal
Anza Resource Consultants
603 Seagaze Dr. #1018
Oceanside, CA 92054

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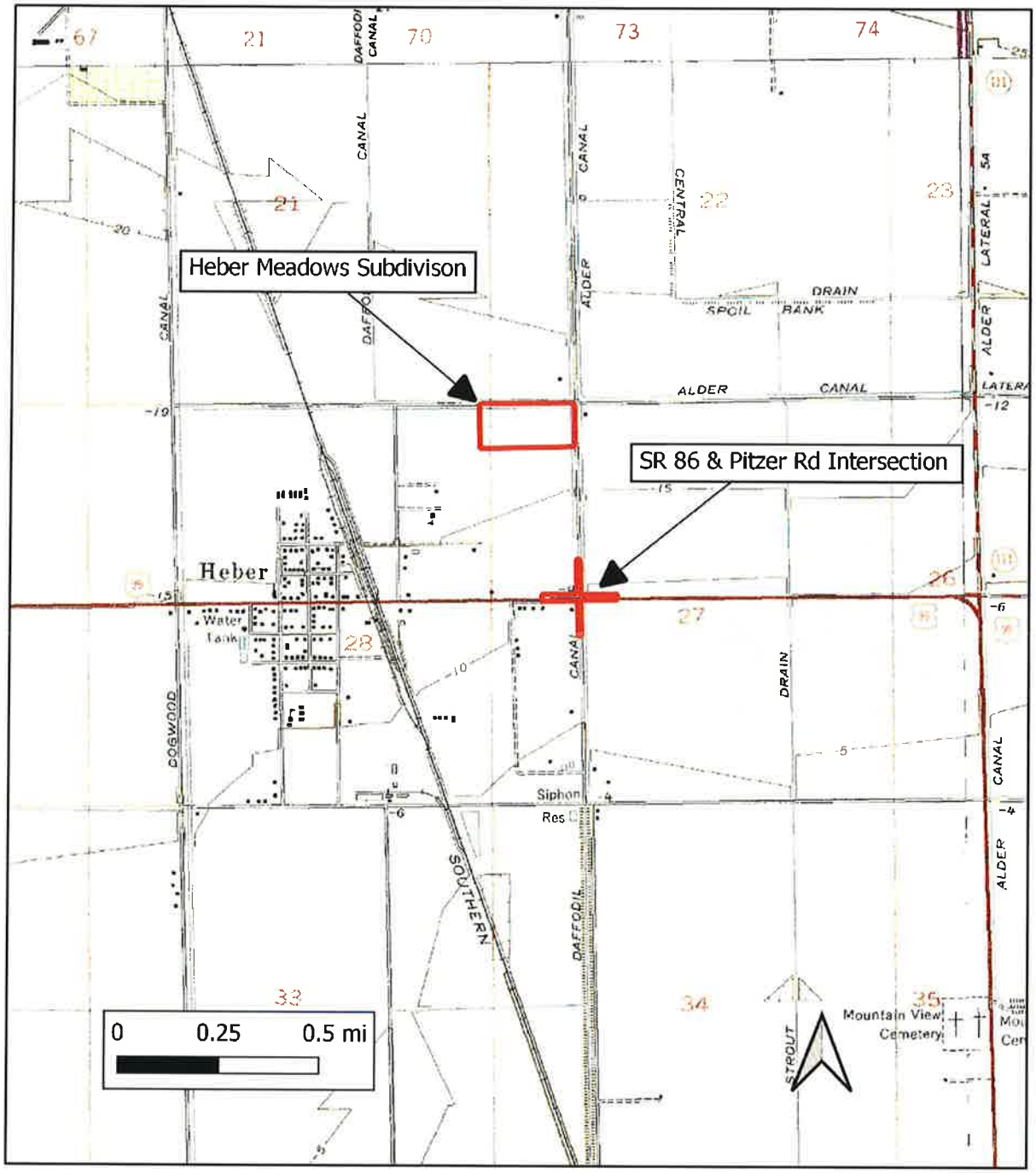


Project Location Map

Heber, CA

anza

From: Quechan Historic Preservation Officer
To: Kevin Hunt
Subject: Heber Meadows Subdivision and SR 86 & Pitzer Rd. Intersection Improvement Project, Imperial County, CA
Date: Wednesday, March 17, 2021 1:36:50 PM

This email is to inform you that we have no comments on this project.

Thank you,
H. Jill McCormick, M.A.

Quechan Indian Tribe
Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899
Office: 760-572-2423
Cell: 928-261-0254
E-mail: historicpreservation@quechantribe.com

Virus-free. www.avast.com

From: Ray Teran
To: Kevin Hunt
Cc: Ernest Pingleton
Subject: Heber Meadows Subdivision Project
Date: Wednesday, April 14, 2021 1:06:29 PM

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

If you wish to utilize Viejas cultural monitors, please call Ernest Pingleton at 619-655-0410 or email, epingleton@viejas-nsn.gov, for contracting and scheduling. Thank you.

If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

Ray Teran
Viejas Tribal Government
Resource Management Director
619-659-2312
rteran@viejas-nsn.gov

Native American Contact Tracking Table- Heber Meadows

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Barona Group of the Capitan Grande ~~Edwin Romero~~ Raymond Welch, Chairperson	1095 Barona Road Lakeside, CA, 92040	~~cloyd@barona-nsn.gov~~ Sue@barona-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Email response 3/18/2021. Forwarded to Councilman Manuel Navarro, who currently handles cultural issues for the tribe. No further response.
Campo Band of Diegueno Mission Indians ~~Ralph Goff~~ Marcus Cuero, Chairperson	36190 Church Road, Suite 1 Campo, CA, 91906	Phone: (619) 478 - 9046 Fax: (619) 478-5818 ~~rgoff@campo-nsn.gov~~ marcuscuero@campo-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Goff no longer Chairman. Spoke with Chairman Marcus Cuero 3/17/2021.
Ewiiaapaayp Band of Kumeyaay Indians Robert Pinto, Chairperson	4054 Willows Road Alpine, CA 91901	wmicklin@leaningrock.net	Letter mailed March 9, 2021	Email March 9, 2021 (letter attached)	No response
Ewiiaapaayp Band of Kumeyaay Indians Michael Garcia, Vice Chairperson	4054 Willows Road Alpine, CA 91901	michaelg@leaningrock.net	Letter mailed March 9, 2021	Email 3/17/2021	No response
Iipay Nation of Santa Ysabel Virgil Perez, Chairperson	P.O. Box 130 Santa Ysabel, CA 92070	Phone: (760) 765 - 0845 Fax: (760) 765-0320	Letter mailed March 9, 2021	n/a	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Inaja-Cosmit Band of Indians Rebecca Osuna, Chairperson	2005 S. Escondido Blvd. Escondido, CA, 92025	Phone: (760) 737 - 7628 Fax: (760) 747-8568 inaja_cosmit@hotmail.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
Jamul Indian Village Erica Pinto, Chairperson	P.O. Box 612 Jamul, CA 91935	Phone: (619) 669 - 4785 Fax: (619) 669-4817 epinto@jiv-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Jamul Indian Village Lisa Cumper, Tribal Historic Preservation Officer	P.O. Box 612 Jamul, CA 91935	Phone: (619) 669 - 4855 lcumper@jiv-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Kwaaymii Laguna Band of Mission Indians Carmen Lucas	P.O. Box 775 Pine Valley, CA, 91962	Phone: (619) 709 - 4207	Letter mailed March 9, 2021	n/a	No response
La Posta Band of Diegueno Mission Indians Gwendolyn Parada, Chairperson	8 Crestwood Road Boulevard, CA 91905	LP13boots@aol.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
La Posta Band of Diegueno Mission Indians Javaughn Miller, Tribal Administrator	8 Crestwood Road Boulevard, CA 91905	Phone: (619) 478 - 2113 Fax: (619) 478-2125 jmiller@LPtribe.net	Letter mailed March 9, 2021	Email 3/17/2021	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Manzanita Band of Kumeyaay Nation Angela Elliott Santos, Chairperson	P.O. Box 1302 Boulevard, CA 91905	(619) 766 – 4930 ljbirdsinger@aol.com	Letter mailed March 9, 2021	Email 3/17/2021	No response
Mesa Grande Band of Diegueno Mission Indians Michael Linton, Chairperson	P.O Box 270 Santa Ysabel, CA 92070	mesagrandeband@msn.com	Letter mailed March 9, 2021	Email 3/17/2021	Email delivery failed. Mailbox was full and not accepting messages. No response
Quechan Tribe of the Fort Yuma Reservation H. Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ 85366	Phone: (760) 572 - 2423 historicpreservation@quechantribe.com	Letter mailed March 9, 2021	N/A	Responded via email 3/17/2021 that the Tribe has no comments on the project.
San Pasqual Band of Diegueno Mission Indians Allen Lawson, Chairperson	P.O. Box 365 Valley Center, CA, 92082	Phone: (760) 749 - 3200 Fax: (760) 749-3876 allenl@sanpasqualtribe.org	Letter mailed March 9, 2021	Email 3/17/2021	No response
Sycuan Band of the Kumeyaay Nation Cody Martinez, Chairperson	1 Kwaaypaay Court El Cajon, CA, 92019	ssilva@sycuan-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	No response
Torres-Martinez Desert Cahuilla Indians Thomas Tortez, Chairperson	P.O. Box 1160 Thermal, CA, 92274	Phone: (760) 397 - 0300 Fax: (760) 397-8146 tmchair@torresmartinez.org	Letter mailed March 9, 2021	Email March 9, 2021 (with attached letter)	No response

Native American Contact	Mailing Address	Phone Number or Email Address	Initial Outreach	Follow- Up	Results
Viejas Band of Kumeyaay Indians John Christman, Chairperson	1 Viejas Grade Road Alpine, CA, 91901	Phone: (619) 445 - 3810 Fax: (619) 445-5337 epingleton@viejas-nsn.gov	Letter mailed March 9, 2021	Email 3/17/2021	Email to Tribal Historic Officer Ernest Pingleton No response

Appendix C:
Resource Record for Daffodil Canal

State of California ♦ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

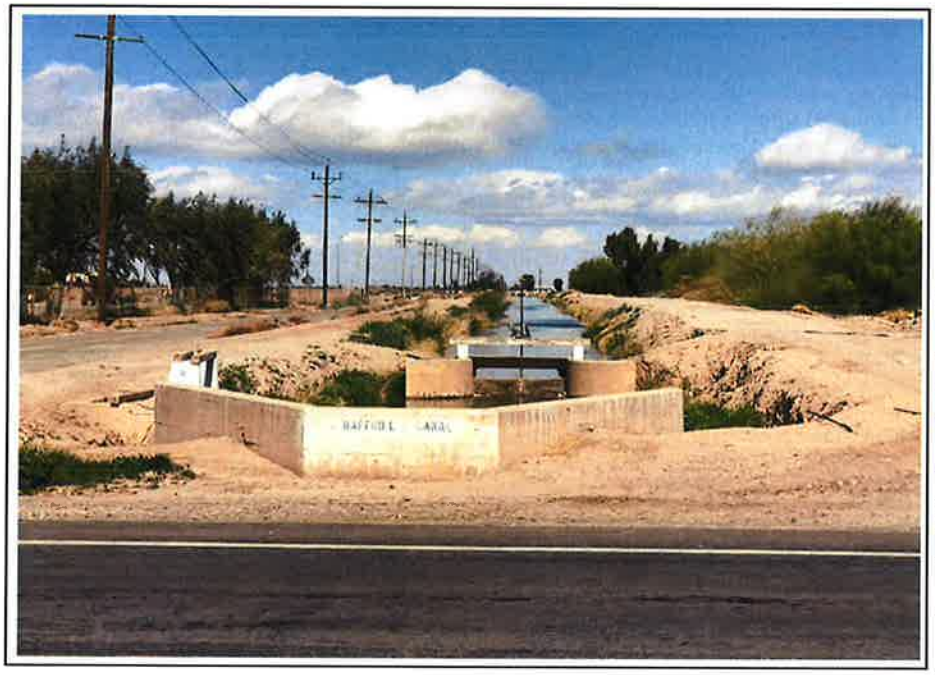
Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 **of** 5 ***Resource Name or #:** Daffodil Canal
P1. Other Identifier: Daffodil Canal of Central Main Branch of All-American Canal System; Heber Drain

*P2. **Location:** ☐ **Not for Publication** ☑ **Unrestricted**
*a. **County** Imperial **and**
*b. **USGS 7.5' Quad** Heber, CA **Date** 2018 **T** 16S ; **R** 14E ; **Sec** 34,27,22,& 21; S.B. **B.M.**
*b. **USGS 7.5' Quad** El Centro, CA **Date** 2018 **T** 16S ; **R** 14E ; **Sec** 16 & 9; S.B. **B.M.**
c. Address City Zip
d. UTM: South end (start) Zone 11N, 639007 mE/ 3620000 mN
Turn 1 Zone 11N, 638927 mE/ 3623180 mN
Turn 2 Zone 11N, 638902 mE/ 3623210 mN
Turn 3 Zone 11N, 638117 mE/ 3623199 mN
Turn 4 Zone 11N, 638030 mE/ 3625983 mN
Turn 5 Zone 11N, 638006 mE/ 3626005 mN
North end (terminus) Zone 11N, 637980 mE/ 3627099 mN
e. Other Locational Data: Alignment inspected at State Route 86 crossing, just east of Pitzer Road in Heber.

***P3a. Description:** Approximately 4.92-mile-long irrigation canal that branches off the Central Main Canal at Jasper Road and Pitzer Road, changes name to Heber Drain in Section 16, terminating just south of Interstate 8. Canal is dirt-lined, constructed prior to 1906, likely in 1902. Canal has been continuously maintained since its construction. The Daffodil Canal is part of the All-American Canal System via the Central Main Canal. Approximately 0.17 mile of the Daffodil Canal near State Route 86 was inspected for this project. Canal is approximately 24 feet wide.

***P3b. Resource Attributes:** HP20. Canal/Aqueduct



***P4. Resources Present:** ☐ Building ☑ Structure ☐ Object ☐ Site ☐ District ☑ Element of District ☐ Other (Isolates, etc.)
P5b. Description of Photo: View of Daffodil Canal from SR 86, facing north.
***P6. Date Constructed/Age and Source:** ☑ Historic ☐ Prehistoric ☐ Both
c.1902 (historic maps and references)
***P7. Owner and Address:**
Imperial Irrigation District
333 E Barioni Blvd
Imperial, CA 92251
***P8. Recorded by:**
Kevin Hunt
Anza Resource Consultants
633 Seagaze Drive, #1018
Oceanside CA 92054
***P9. Date Recorded:**
March 10, 2021
***P10. Survey Type:** (Describe)
Pedestrian
***P11. Report Citation:**
Hunt, Kevin, and Katherine Collins. June 2021. Cultural Resources Study for the State Route 86 at Pitzer Road Intersection Improvement Project, Community of Heber, Imperial County, California.

***Attachments:** ☐NONE ☑Location Map ☐Continuation Sheet ☑Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♿ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** Daffodil Canal ***NRHP Status Code** 3D

B1. Historic Name: Daffodil Canal

B2. Common Name: Daffodil Canal and Heber Drain (northern end)

B3. Original Use: irrigation canal B4. Present Use: irrigation canal

***B5. Architectural Style:** utilitarian (open earth-lined canal)

***B6. Construction History:** The canal was most likely constructed in 1902, when the Central Main Canal was completed that brought irrigation water to this portion of Imperial Valley (i.e., the area east of the Alamo River and west of the New River). Available maps prior to 1940 are unclear regarding the northern extent of the canal but the Daffodil Canal is visible on the 1906 *Reconnaissance Map of the Salton Sink California* 1:500,000-scale map and the 1915 *El Centro, CA* 1:125,000-scale map. The 1940 (1955 ed.) and 1943 (1945 ed.) *Brawley, CA* 1:62,500-scale maps depict the Daffodil Canal continuing north from Heber through El Centro. to approximately halfway between El Centro and Imperial. Since at least 1957, the Daffodil Canal becomes the Heber Drain near the center of Section 16. The Heber Drain currently terminates just south of Interstate 8 near El Centro. The Daffodil Canal is earth-lined, with concrete headwalls and concrete, steel, and wood gates of unknown construction dates but appearing relatively new.

***B7. Moved?** ☑No ☐Yes ☐Unknown **Date:** **Original Location:**

***B8. Related Features:** The Daffodil Canal is a part of the Central Main Canal system, which in turn was originally part of the Alamo Canal system and then the All-American Canal system. The Daffodil Canal changes names to the Heber Drain north of Heber but south of El Centro.

B9a. Architect: b. Builder:

***B10. Significance: Theme** Agricultural Development **Area** Imperial County

Period of Significance ca.1900-present **Property Type** Canal **Applicable Criteria** A/1

The irrigation of Imperial Valley was the single most important accomplishment for the agricultural and subsequently overall development of the region. The Daffodil Canal is not individually responsible for this; rather, it was part of the Alamo Canal system and then became part of the All-American Canal system that provides drinking water and agricultural irrigation and drainage to the valley. Access to reliable water is responsible for all subsequent development of the Imperial Valley and agriculture remains its primary product. As such, the Daffodil Canal meets NRHP/CRHR Criterion A/1 as part of the All-American Canal system and previous Alamo Canal system. The All-American Canal has been previously evaluated and recommended NRHP eligible as a contributor to an NRHP-eligible district (Status Code 3D). There is no individual wholly responsible or singularly identified with the creation of the canal system (does not meet NRHP/CRHR Criterion B/2). Instead, this development was accomplished through multiple private and local and federal governmental efforts, with interests that mostly aligned. The Daffodil Canal is a simple earth-lined, concrete and wood-gated, gravity-fed canal with no special construction methods or features. The Daffodil Canal does not meet NRHP/CRHR Criterion C/3. The Daffodil Canal retains no significant data potential and does not meet NRHP/CRHR Criterion D/4. The Daffodil Canal appears NRHP/CRHR eligible under Criterion A/1 as a contributor to an NRHP/CRHR-eligible district (Status Code 3D).

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

Douglas et al. 1906. 1906 Reconnaissance Map of the Salton Sink California. USGS.
Dowd, M.J. 1956. *IID – The First 40 Years.* Imperial Irrigation District (IID), El Centro, California.
Imperial Irrigation District. 1977. *Imperial Valley, California. From Desert Wasteland to Agricultural Wonderland: The Story of Water and Power.* Imperial Irrigation District, El Centro, California.
IID and Bureau of Reclamation. 2002. Imperial Irrigation District Water Conservation and Transfer Project and Draft Habitat Conservation Plan Draft Environmental Impact Report/Environmental Impact Statement.
JRP Historical Consulting, Inc., and Caltrans. 2000. Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures.

B13. Remarks:

***B14. Evaluator:** Kevin Hunt, Anza Resource Consultants

***Date of Evaluation:** 6/1/2021

(This space reserved for official comments.)

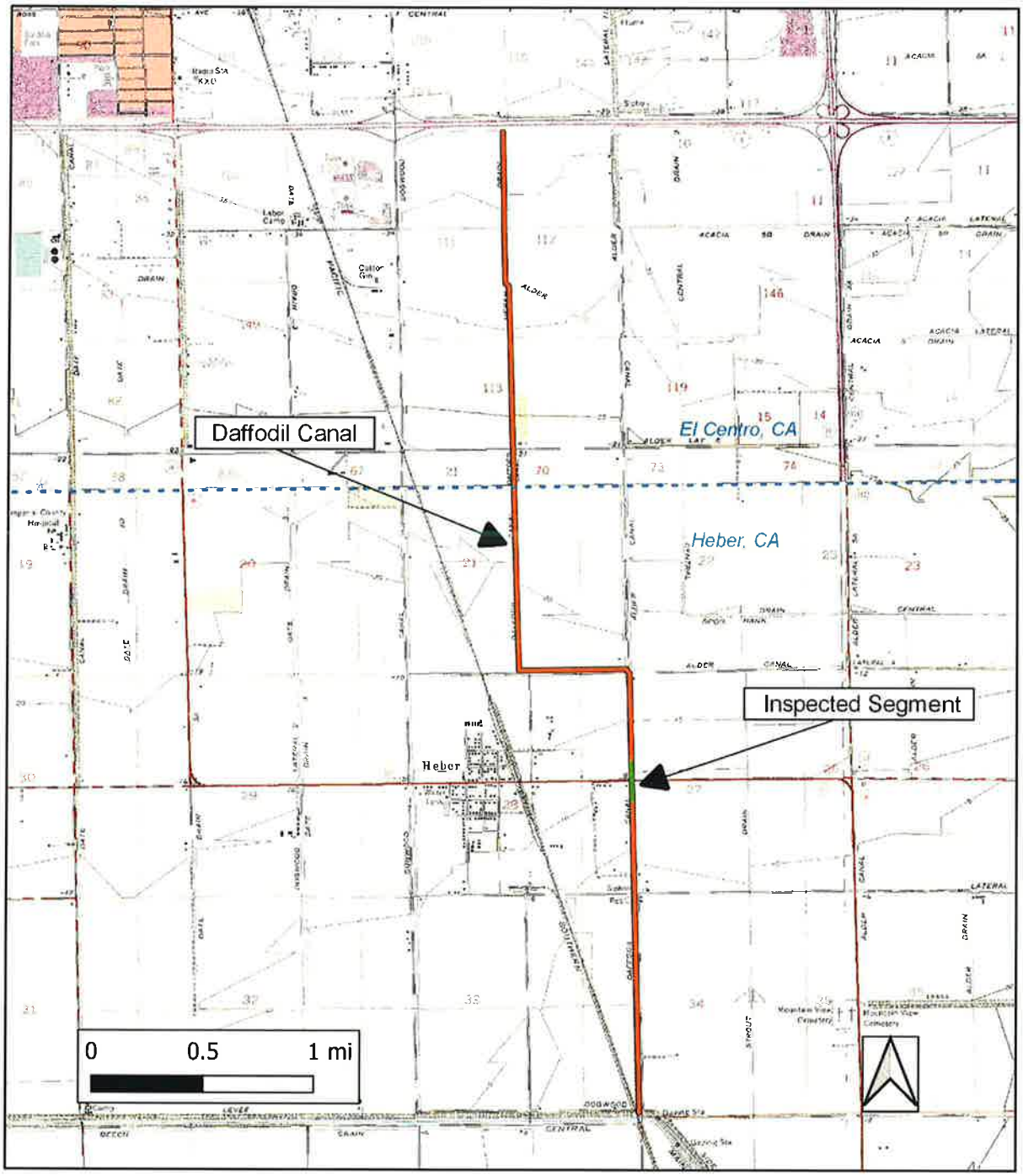
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

*Resource Name or # Daffodil Canal

*Map Name: El Centro, CA & Heber, CA *Scale: 1:24,000 (shown at 1:40,000) *Date of map: 1957 (1980 ed.) & 1957 (1981 ed.)



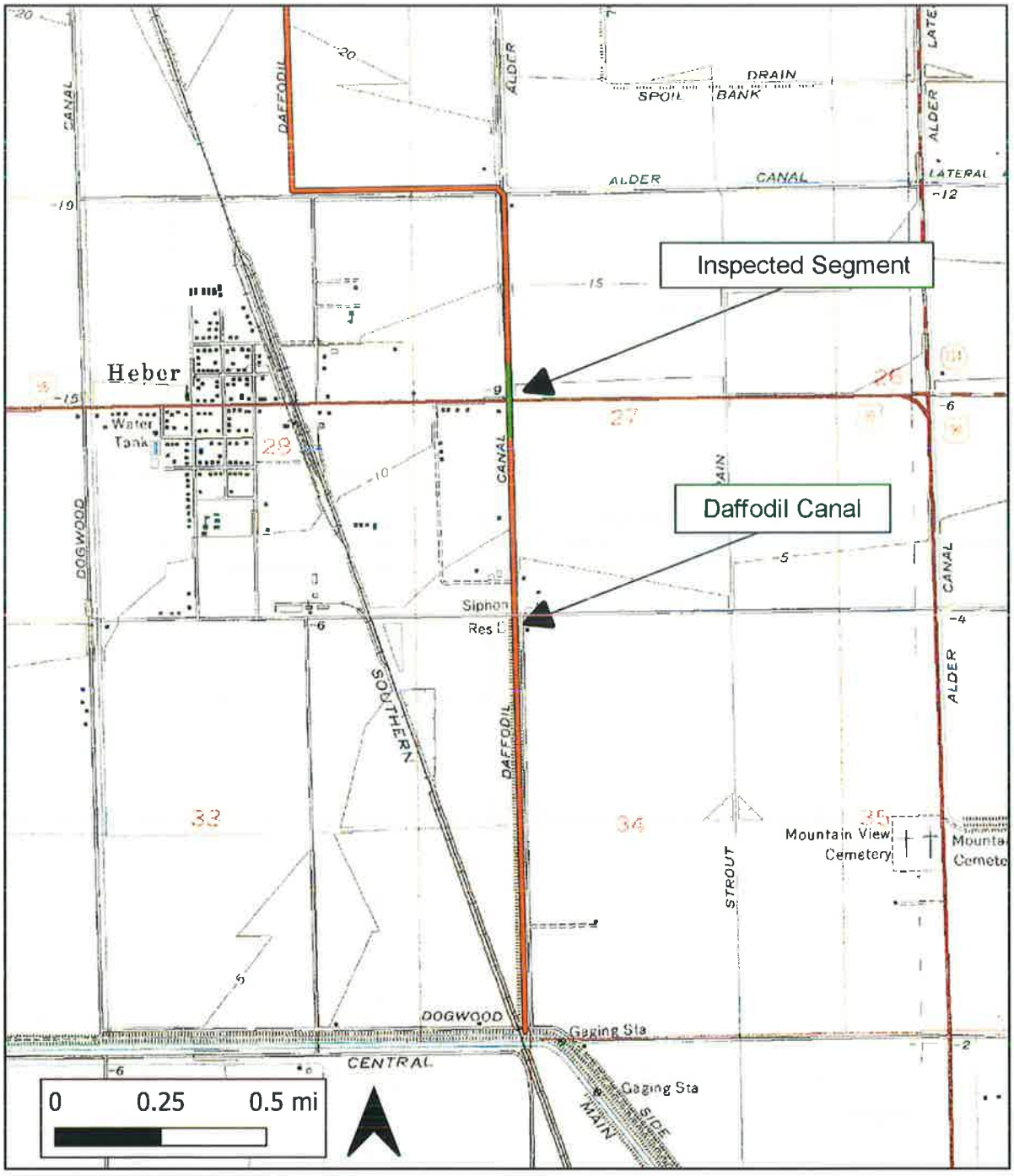
* Required information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

*Resource Name or # Daffodil Canal (southern portion)

*Map Name: Heber, CA *Scale: 1:24,000 *Date of map: 1957 (1981 ed.)



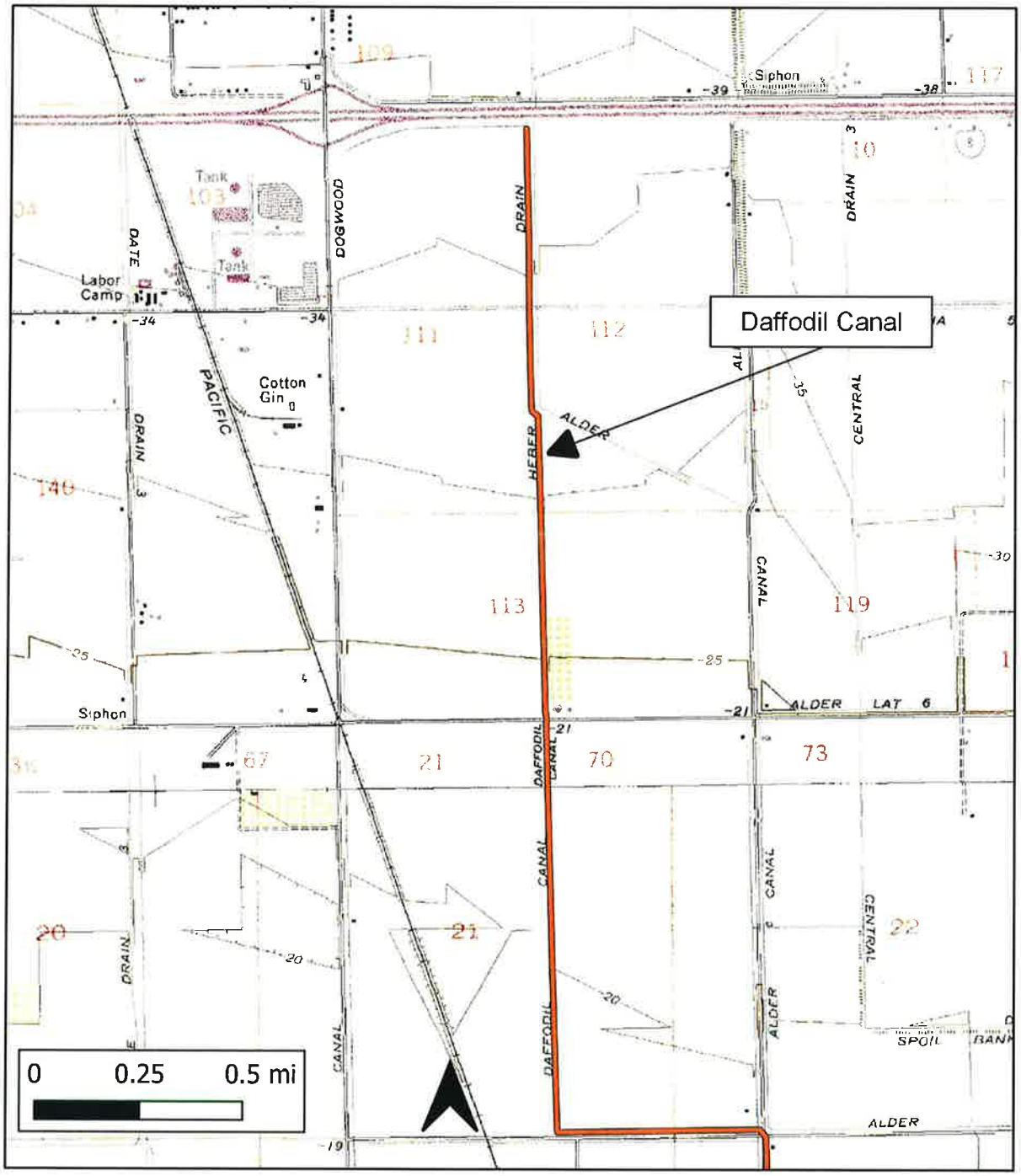
* Required information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Page 5 **of** 5 ***Resource Name or #** Daffodil Canal (northern portion including Heber Drain)

***Map Name:** El Centro, CA & Heber, CA ***Scale:** 1:24,000 ***Date of map:** 1957 (1980 ed.) & 1957 (1981 ed.)



* Required information

Attachment "E"

Geotechnical Report

Proposed Heber Meadows Apartments
SWC Correll Road and Pitzer Road
Heber, California

Prepared for:

Heber Meadows I, LP
6339 Paseo del Lago
Carlsbad, CA 92011

LANDMARK
Geo-Engineers and Geologists

Prepared by:

Landmark Consultants, Inc.
780 N. 4th Street
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(760) 370-3000

December 2020

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December 23, 2020

Mr. David Davis
Heber Meadows I, LP
6339 Paseo del Lago
Carlsbad, CA 92011

Geotechnical Report
Proposed Heber Meadows Apartments
SWC Correll Road and Pitzer Road
Heber, California
LCI Report No. LE20178

Dear Mr. Davis:

This geotechnical report is provided for design and construction of the proposed Heber Meadows apartment complex on a 16.5 acre parcel located at the southwest corner of Correll Road and Pitzer Road in northeastern Heber, California. Our geotechnical exploration was conducted in response to your request for our services. The enclosed report describes our soil engineering site evaluation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

Based on the geotechnical conditions encountered at the points of exploration, the project site appears suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 370-3000.

Respectfully Submitted,
Landmark Consultants, Inc.

Jeffrey O. Lyon, PE
CEO/Principal Engineer

Steven K. Williams, PG, CEG
Senior Engineering Geologist

TABLE OF CONTENTS

Appendices

APPENDIX A: Vicinity and Site Maps
APPENDIX B: Subsurface Soil Logs and Soil Key
APPENDIX B: Cone Penetration Test (CPT) Logs and Key to CPT Interpretations
APPENDIX C: Laboratory Test Results
APPENDIX D: Liquefaction Analysis

EXECUTIVE SUMMARY

This executive summary presents ***selected*** elements of our findings and professional opinions. This summary ***may not*** present all details needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are ***best related through reading the full report***, and are best evaluated with the active participation of the engineer of record who developed them. The findings of this study are summarized below:

- Clay soils (CL/CH) of medium expansion (EI = 82) predominate the near surface soils at the project site.

- Foundation designs should mitigate expansive soil conditions by either the removal and replacement of the upper 3.0 feet of clay soils with non-expansive soil or design of foundations to resist expansive forces, such as flat plate structural mats, grade-beam stiffened floor slabs, or post-tensioned floor slabs. A combination of the methods described above may also be used.

- Design soil bearing pressure = 1,500 psf with standard increases allowed by the California Building Code. Differential movement of 1.0 to 1.5 inches can be expected for slab on grade foundations placed on clay soils.

- The risk of liquefaction induced settlement is low. Liquefaction may occur in isolated silt and sand layers encountered at depths of 8 to 50 feet below ground surface. Potential liquefaction induced settlements of ¼ to 1 inch have been estimated for the project site. There is a very low risk of ground rupture and/or sand boil formation should liquefaction occur.

- The native soils are aggressive to concrete and steel. Concrete mixes for concrete placed in contact with native soils shall have a maximum water cement ratio of 0.45 and a minimum compressive strength of 4,500 psi (minimum of 6 sacks Type V cement per cubic yard). All concrete should be thoroughly vibrated to remove rock pockets and minimize air voids.

- All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934). Hold-down straps at the foundation perimeter and pressurized water lines below or within the foundations are not allowed.

- The clay soils are non-absorptive and are not well suitable for infiltration at stormwater basins.

- Pavement structural sections should be designed for clay subgrade soils (R-Value = 5) and an appropriate Traffic Index (TI) selected by the civil designer.

Section 1
INTRODUCTION

1.1 Project Description

This report presents the findings of our geotechnical exploration and soil testing for the proposed Heber Meadows apartment complex located on a 16.5 acre parcel at the southwest corner of Correll Road and Pitzer Road in northeastern Heber, California (See Vicinity Map, Plate A-1). The proposed development will consist of twenty (20) 2-story housing units, five (5) community buildings, and associated tenant parking constructed in four phases. A site plan for the proposed development was provided by the client.

The structures are planned to consist of slabs-on-grade foundations and wood-frame construction. Footing loads at exterior bearing walls are estimated at 1 to 5 kips per lineal foot. Column loads are estimated to range from 10 to 50 kips. If structural loads exceed those stated above, we should be notified so we may evaluate their impact on foundation settlement and bearing capacity. Site development will include building pad preparation, underground utility installation including trench backfill, concrete foundation construction, street and parking lot construction, and concrete driveway and sidewalk placement.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the subsurface soil at selected locations within the site for evaluation of physical/engineering properties and liquefaction potential during seismic events. Professional opinions were developed from field and laboratory test data and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction. The scope of our services consisted of the following:

- Field exploration and in-situ testing of the site soils at selected locations and depths.
- Laboratory testing for physical and/or chemical properties of selected samples.
- Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- Engineering analysis and evaluation of the data collected.
- Preparation of this report presenting our findings and professional opinions regarding the geotechnical aspects of project design and construction.

This report addresses the following geotechnical parameters:

- Subsurface soil and groundwater conditions
- Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- Liquefaction potential and its mitigation
- Expansive soil and methods of mitigation
- Aggressive soil conditions to metals and concrete

Professional opinions with regard to the above parameters are provided for the following:

- Site grading and earthwork
- Building pad and foundation subgrade preparation
- Allowable soil bearing pressures and estimated settlements
- Concrete slabs-on-grade
- Lateral earth pressures
- Excavation conditions and buried utility installations
- Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- Seismic design parameters
- Pavement structural sections

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions, storm water infiltration, groundwater mounding, or landscape suitability of the soil.

1.3 Authorization

Ms. Heidi Mather, Authorized Agent for Heber Meadows I, LLC provided authorization by written agreement to proceed with our work on December 2, 2020. We conducted our work in general accordance with our written proposal dated September 23, 2019.

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

Subsurface exploration was performed on November 17, 2020 using Kehoe Testing and Engineering, Inc. of Huntington Beach, California to advance eight (8) electric cone penetrometer (CPT) soundings to approximate depths of 25 to 50 feet below existing ground surface. The soundings were made at the locations shown on the Site and Exploration Plan (Plate A-2). The approximate sounding locations were established in the field and plotted on the site map by sighting to discernible site features. Shallow (4-foot deep) mechanical auger borings (6-inch diameter) were made adjacent to the CPT soundings in order to obtain near surface soil samples for laboratory analysis.

CPT soundings provide a continuous profile of the soil stratigraphy with readings every 2.5cm (1 inch) in depth. Direct sampling for visual and physical confirmation of soil properties has been used by our firm to establish direct correlations with CPT exploration in this geographical region.

The CPT exploration was conducted by hydraulically advancing an instrumented Hogentogler $15cm^2$ conical probe into the ground at a rate of 2cm per second using a 30-ton truck as a reaction mass. An electronic data acquisition system recorded a nearly continuous log of the resistance of the soil against the cone tip (Qc) and soil friction against the cone sleeve (Fs) as the probe was advanced. Empirical relationships (Robertson and Campanella, 1989) were then applied to the data to give a continuous profile of the soil stratigraphy. Interpretation of CPT data provides correlations for SPT blow count, phi (ϕ) angle (soil friction angle), undrained shear strength (S_u) of clays and over-consolidation ratio (OCR). These correlations may then be used to evaluate vertical and lateral soil bearing capacities and consolidation characteristics of the subsurface soil.

Interpretive logs of the CPT soundings are presented on Plates B-1 through B-8 in Appendix B. A key to the interpretation of CPT soundings is presented on Plate B-9. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Laboratory Testing

Laboratory tests were conducted on selected bulk soil samples obtained from mechanical auger borings made adjacent to the CPT locations to aid in classification and evaluation of selected engineering properties of the near surface soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- Plasticity Index (ASTM D4318)
- Particle Size Analyses (ASTM D422)
- Expansion Index (Swell) Test (ASTM D4829)
- Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods)

The laboratory test results are presented in Appendix C.

Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were either extrapolated from correlations with the subsurface CPT data or from data obtained from the field and laboratory testing program.

Section 3
DISCUSSION

3.1 Site Conditions

The 16.5 acre project site is located along the south side of Correll Road between Bloomfield Street and Pitzer Road in northeastern Heber. The project site is vacant and flat-lying with moderately thick vegetation covering the site. The site was previously part of an agricultural field that has been fallow since about 2005 when the Heber Meadows subdivision (single family residential) was developed. Scattered piles of undocumented fill were noted throughout the project site.

Adjacent properties are flat-lying and are approximately at the same elevation with this site. Agricultural fields are located to the north and east. The Heber Meadows subdivision is located to the south and a vacant lot is located to the west.

The project site lies at an elevation of approximately 15 feet below mean sea level (MSL) (El. 985 local datum) in the Imperial Valley region of the California low desert. The surrounding properties lie on terrain which is flat (planar), part of a large agricultural valley, which was previously an ancient lake bed covered with fresh water to an elevation of 43± feet above MSL. Annual rainfall in this arid region is less than 3 inches per year with four months of average summertime temperatures above 100 °F. Winter temperatures are mild, seldom reaching freezing.

3.2 Geologic Setting

The project site is located in the Salton Trough region of the Colorado Desert physiographic province of southeastern California. The Salton Trough is a topographic and geologic structural depression resulting extending from the San Gorgonio Pass to the Gulf of California (Norris & Webb, 1990). The Salton Trough is bounded on the northeast by the San Andreas fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments deposited since the Miocene Epoch (Morton, 1977). Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene (present) lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a fresh water lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet.

3.3 Subsurface Soil

The UC Davis California Soil Resource Lab "SoilWeb Earth" computer application (UC Davis, 2020) for Google Earth indicates that surficial deposits at the project site consist predominantly of silty clay loams overlying fine sands of the Imperial soil group (see Plate A-3). These loams are formed in sediment and alluvium of mixed origin (Colorado River overflows and fresh-water lake-bed sediments).

The subsurface soils encountered during the field exploration conducted on November 17, 2020 consist of interbedded silts and clays to a depth of 50 feet. The near surface soils consist of moderately expansive clays. A silty layer is encountered between a depth of approximately 5 to 10 feet below ground surface. Clays were encountered below 10 feet. The subsurface logs (Plates B-1 through B-8) depict the stratigraphic relationships of the subsurface soil encountered at the boring locations. Variations in subsurface stratigraphy may occur between the points of exploration. The stratification lines shown on the subsurface log represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

The native surface clays generally exhibit moderate swell potential (Expansion Index, EI = 82) when tested according to the Standard Test Method for Expansion Index of Soils (ASTM D4829).

The clay is expansive when wetted and can shrink with moisture loss (drying). Development of building foundations and concrete flatwork should include provisions for mitigating potential swelling forces and reduction in soil strength, which can occur from saturation of the soil. Causes for soil saturation include landscape irrigation, broken utility lines, or capillary rise in moisture upon sealing the ground surface to evaporation.

Moisture losses can occur with lack of landscape watering, close proximity of structures to downslopes and root system moisture extraction from deep rooted shrubs and trees placed near the foundations. The design structural engineer (foundations) should consider the effects of non-uniform moisture conditions around the entire foundation when selecting design criteria for the foundations. Typical measures used for similar projects to remediate expansive soil include:

- Replacement of expansive clays (3.0 feet) with non-expansive sands or silts.
- Moisture conditioning subgrade soils to a minimum of 5% above optimum moisture (ASTM D1557) within the drying zone of surface soils.
- Capping clay soil with a non-expansive sand layer of sufficient thickness (3.0 feet minimum) to reduce the effects of soil shrink/swell.
- Design of foundations that are resistant to shrink/swell forces of clay soil.
- A combination of the methods described above

3.4 Groundwater

Groundwater was not noted in the CPT soundings, but is typically encountered at approximately 8 to 10 feet below ground surface in the vicinity of the project site. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. Groundwater levels may fluctuate with precipitation, irrigation of adjacent properties, site landscape watering, drainage, and site grading. The referenced groundwater level should not be interpreted to represent an accurate or permanent condition. Our work scope did not include a groundwater surface mounding study resulting from applied landscape water.

3.5 Faulting

The project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (USGS, 1990). We have performed a computer-aided search of known faults or seismic zones that lie within a 35 mile radius of the project site (Table 1).

A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults. The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults (CGS, 2019b). Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the Alquist-Priolo Act (AP).

Review of the current Earthquake Fault Zone maps (CGS, 2019a) indicates that the nearest zoned fault is the Imperial fault located approximately 5.2 miles east of the project site.

3.6 General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. **This project site has been classified as Site Class D and has a S_1 value of 0.6, which would require a site-specific ground motion hazard analysis.** However, ASCE 7-16 Section 11.4.8 provides three exceptions which permit the use of conservative values of design parameters for certain conditions for Site Class D and E sites in lieu of a site specific hazard analysis. The exceptions are:

- Exception 1: Structures on Site Class E sites with S_s greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.

- Exception 2: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Equations 12.8-2 for values of $T \leq 1.5T_S$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $T_L \geq T > 1.5T_S$ or Equation 12.8-4 for $T > T_L$.
- Exception 3: Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_S and the equivalent static force procedure is used for design.

The project structural engineer should confirm that an exception applies to the project. If none of the exceptions apply, our office should be consulted to perform a site-specific ground motion hazard analysis.

The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2020) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions. The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGA_M) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803.5.12 ($PGA_M = F_{PGA}*PGA$) is estimated at 0.60g for the project site. **Design earthquake ground motion parameters are provided in Table 2.**

3.7 Seismic and Other Hazards

- **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the Imperial, Brawley, and Superstition Hills faults.
- **Surface Rupture.** The California Geological Survey (2019b) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consists of boundary zones surrounding well defined, active faults or fault segments. The project site does not lie within an A-P Earthquake Fault Zone; therefore, surface fault rupture is considered to be low at the project site.

- **Liquefaction and lateral spreading.** Liquefaction is a potential design consideration because of underlying saturated sandy substrata. Although the Imperial Valley has not yet been evaluated for seismic hazards by the California Geological Survey seismic hazards zonation program, liquefaction is well documented in the Imperial Valley after strong seismic events (McCrink, et al, 2011 and Rymer et al, 2011). The potential for liquefaction at the site is discussed in more detail in Section 3.8. Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography.

Other Potential Geologic Hazards.

- **Landsliding.** The hazard of landsliding is unlikely due to the regional planar topography. No ancient landslides are shown on geologic maps, aerial photographs and topographic maps of the region and no indications of landslides were observed during our site investigation.
- **Volcanic hazards.** The site is not located proximal to any known volcanically active area and the risk of volcanic hazards is considered low. Obsidian Butte and Red Hill, located at the south end of the Salton Sea approximately 30 miles north of the project site, are small remnants of volcanic domes. The domes erupted about 1,800 to 2,500 years ago (Wright et al, 2015). The subsurface brine fluids around the domes have a high heat flow and are currently being utilized to produce geothermal energy.
- **Tsunamis and seiches.** Tsunamis are giant ocean waves created by strong underwater seismic events, asteroid impact, or large landslides. Seiches are large waves generated in enclosed bodies of water in response to strong ground shaking. The site is not located near any large bodies of water, so the threat of tsunami, seiches, or other seismically-induced flooding is considered unlikely.
- **Flooding.** Based on our review of FEMA (2008) FIRM Panel 06025C2075C which encompasses the project site, the project site is located in Flood Zone X, an area determined to be outside the 0.2% annual chance (500-year) floodplain.
- **Collapsible soils.** Collapsible soil generally consists of dry, loose, low-density material that have the potential collapse and compact (decrease in volume) when subjected to the addition of water or excessive loading. Soils found to be most susceptible to collapse include loess (fine grained wind-blown soils), young alluvium fan deposits in semi-arid to arid climates, debris flow deposits and residual soil deposits. Due to the cohesive nature of the subsurface soils and shallow groundwater, the potential for hydro-collapse of the subsurface soils at this project site is considered very low.

- **Expansive soils.** In general, much of the near surface soils in the Imperial Valley consist of silty clays and clays which are moderate to highly expansive. The expansive soil conditions are discussed in more detail in Section 3.3.

3.8 Liquefaction

Liquefaction occurs when granular soils below the water table are subjected to vibratory motions, such as those produced by earthquakes. With strong ground shaking, the pore water pressure increases as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The computer program CLiq (Version 2.2.0.32, Geologismiki, 2017) was utilized for liquefaction assessment at the project site. The estimated settlements have been adjusted for transition zones between layers and the post liquefaction volumetric strain has been weighed with depth (Robertson, 2014 and Cetin et al., 2009). Computer printouts of the liquefaction analyses are provided in Appendix D.

The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2008) methods. The 1997 NCEER methods utilize CPT cone readings from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected tip pressures $Q_{tn,cs}$.

The analysis was performed using a PGA_M value of 0.60g was used in the analysis with an 8-foot groundwater depth and a threshold factor of safety (FS) of 1.3.

The fines content of the liquefiable sands and silts increases their liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures. The CPT tip pressures (Qc) were adjusted to an equivalent clean sand pressure ($Q_{tn,cs}$) in accordance with NCEER (1998).

The soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within several isolated silt and sand layers between depths of 8 to 50 feet. The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the Imperil and other nearby faults. The analysis is summarized in the table below.

Summary of Liquefaction Analysis

Boring Location	Depth To First Liquefiable Zone (ft)	Potential Induced Settlement (in)
CPT-1	18.5	1
CPT-3	8.0	½
CPT-5	9.0	¾
CPT-7	46.5	¼

Liquefaction Induced Settlements: ***Based on empirical relationships, total induced settlements are estimated to be less than 1 inch should liquefaction occur.*** Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with California Special Publication 117. Accordingly, there is a potential for less than ¾ inch of liquefaction induced differential settlement at the project site. The differential settlement based on seismic settlements is estimated at 1 inch over a distance of 100 feet. Foundations should be designed for a maximum deflection of L/720.

Because of the depth of the liquefiable layer, the 8 foot thick non-liquefiable clay layer may act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures.

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003). Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography. According to Youd (2005), if the liquefiable layer lies at a depth greater that about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site.

Mitigation: Based on an estimate of less than 1 inch of liquefaction induced settlements, no ground improvement or deep foundation mitigation is required at this project site. The differential settlement caused by liquefaction is estimated at approximately ¾ inch. The designer should utilize foundation designs which mitigate the liquefaction induced settlement.

Because of the potential for differential settlement due to liquefaction, the designer should consider the following options for design of the structure:

1) Foundations that use grade-beam footings to tie floor slabs and isolated columns to continuous footings (conventional or post-tensioned).

2) Structural flat-plate mats, either conventionally reinforced or tied with post-tensioned tendons.

These alternatives reduce the potential effects of liquefaction-induced settlements by making the structures more able to withstand differential settlement.

Section 4
DESIGN CRITERIA

4.1 Site Preparation

Preconstruction Meeting: A preconstruction conference should be held at the site prior to the beginning of grading operations with, as a minimum, the owner's representative, grading contractor and geotechnical engineer in attendance.

Clearing and Grubbing: All surface improvements, debris or vegetation including grass, trees, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic strippings should be stockpiled and not used as engineered fill. All trash, construction debris, concrete slabs, old pavement, landfill, contaminated soil, and buried obstructions such as old foundations and utility lines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision. Any excavations resulting from site clearing should be sloped to a bowl shape to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

Street Subgrade Preparation: The native clay soils in street areas should be removed and recompacted to 12 inches below the design subgrade elevation. If dry soils are encountered at 12 inches below the design subgrade elevation, an additional 12 inches of native soil shall be uniformly moisture conditioned to 4 to 8% above optimum moisture content. Engineered fill in street areas should be uniformly moisture conditioned to a minimum of 4% above optimum moisture, placed in layers not more than 6 inches in thickness and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density.

Building Pad Preparation for Foundations Placed on Native Clay Soils: The existing soils within the building pad/foundation areas should be overexcavated to a minimum depth of 36 inches below the existing natural surface grade or 24 inches below the deepest footing (whichever is deeper) and should extend at least five (5) feet beyond all exterior wall/column lines (including concreted areas adjacent to the building). Exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to 5 to 10% above optimum moisture content and recompacted to 85 to 90% of the maximum density determined in accordance with ASTM D1557 methods.

Prior to over-excavation of the surface soil, deep moisture penetration may be achieved by bordering the site and applying multiple floodings or by sprinkler application to allow water to permeate to a minimum depth of 4.0 feet (20% minimum moisture content) below existing natural surface. Extended drying periods may be required when utilizing this method of pre-saturation.

The native soil is suitable for use as engineered fill provided it is free from concentrations of organic matter or other deleterious material. The fill soil should be uniformly moisture conditioned by discing and watering to the limits specified above, placed in maximum 8-inch lifts (loose), and compacted to the limits specified above. Clay soil should not be overcompacted because highly compacted soil will result in increased swelling. Imported fill soil (for foundations designed for expansive soil conditions) should have a Plasticity Index less than 25 and sulfates (SO_4) less than 4,000 ppm.

Sidewalk and Concrete Hardscape Areas: In areas other than the building pad which are to receive sidewalks or area concrete slabs, the ground surface should be presaturated (20% minimum moisture content) to a minimum depth of 24 inches and then scarified to 8 inches, moisture conditioned to a minimum of 5% over optimum, and recompacted to 85-90% of ASTM D1557 maximum density just prior to concrete placement.

Moisture Control and Drainage: If clay soils are used at building pads (without 3.0 feet of granular, non-plastic soil), the moisture condition of the building pad should be maintained during trenching and utility installation until concrete is placed or should be rewetted by use of multiple applications of water with sprinklers before initiating delayed construction.

Adequate site drainage is essential to future performance of the project. Infiltration of excess irrigation water and stormwaters can adversely affect the performance of the subsurface soil at the site. Positive drainage should be maintained away from all structures (5% for 10 feet minimum across unpaved areas) to prevent ponding and subsequent saturation of the native clay soil. Gutters and downspouts should be used as a means to convey water away from foundations. If landscape irrigation is allowed next to the building, drip irrigation systems or lined planter boxes should be used. The subgrade soil around the entire foundation should be maintained in a moist, but not saturated state, and not allowed to dry out. The owner/developer should consider utilizing drip irrigation systems around the entire building perimeter to maintain soil moisture. Drainage should be maintained without ponding.

Trees should be set back from foundations a minimum of 20 feet from the foundation.

Observation and Density Testing: All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area. The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*" and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the geotechnical parameters for site development.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have footings extended to a minimum of 30 inches below grade. The existing soil beneath the structure foundation prepared in the manner described for the building pad except the preparation needed only to extend 18 inches below and beyond the footing.

4.2 Foundations and Settlements

Expansive Soil Engineered Building Pad: For foundations placed on an engineered building pad consisting of native clay soils, shallow spread or continuous footings are suitable to support the apartment buildings provided they are structurally tied with grade-beams to continuous perimeter wall footings to resist differential movement associated with expansive soils and potential soil liquefaction at depth. A minimum of 18 inches of compacted fill should exist beneath the footings. Continuous wall footings should have a minimum depth of 24 inches and minimum width of 12 inches. Spread footings should have a minimum dimension of 24 inches and should be structurally tied to perimeter footings or grade beams. Concrete reinforcement and sizing for all footings should be provided by the structural engineer.

The foundations may be designed using an allowable soil bearing pressure of 1,500 psf for compacted native clay soil. The allowable soil pressure may be increased by 20% for each foot of embedment depth of the footings in excess of 18 inches and by one-third for short term loads induced by winds or seismic events. The maximum allowable soil pressure at increased embedment depths shall not exceed 3,000 psf (clays).

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 250 pcf to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.25 may also be used at the base of the footings to resist lateral loading.

Flat plate structural mats, grade-beam reinforced foundations, or post tensioned reinforced foundations may be used to mitigate expansive soil heave and/or liquefaction related movement.

- Flat Plate Structural Mats: Flat plate structural mats may be used to mitigate expansive soils at the project site. The structural mat shall have a double mat of steel (minimum No. 4's @ 12 inches O.C. each way – top and bottom) and a minimum thickness of 10 inches. Mat edges shall have a minimum edge footing of 12 inches width and 24 inches depth (below the building pad surface). Mats may be designed by CBC Chapter 18, Section 1808.6.2 methods (*WRI/CRSI Design of Slab-on-Ground Foundations*).

  Structural mats may be designed for a modulus of subgrade reaction (Ks) of 50 pci when placed on compacted clay or a subgrade modulus of 300 pci when placed on 3.0 feet of granular fill. Mats shall overlay 2 inches of sand and a 10-mil polyethylene vapor retarder. The building support pad shall be moisture conditioned and recompacted as specified in Section 4.1 of this report.

- Grade-beam Reinforced Foundations: Specific soil data for structures with grade-beam reinforced foundations placed on the native clays are presented below in accordance with the design method given in CBC Chapter 18 Section 1808.6.2 (*WRI/CRSI Design of Slab-on-Ground Foundations*):

  Weighted Plasticity Index (PI) = 34
  Slope Coefficient (C_s) = 1.0
  Strength Coefficient (C_o) = 0.8
  Climatic Rating (C_w) = 15
  Effective PI = 24
  Maximum Grade-beam Spacing = 20 feet

Exterior footings shall be founded a minimum of 24 inches below the surface of the building support pad on a layer of properly prepared and compacted native soil as described in Section 4.1. Interior footings shall have a minimum embedment depth of 12 inches.

- Post-tensioned Slabs: If post-tensioned slabs are considered for this project, the following basic (minimum) soil criteria should be used in accordance with CBC Chapter 18 Section 1808.6.2 (*PTI 10.5 Standard Requirements for Design and Analysis of Shallow Post-Tensioned Concrete Foundations on Expansive Soils*). ***The design engineer may consider other site conditions that may warrant more conservative design values.***

Atterberg Limits:		
Liquid Limit	55	
Plasticity Limit	21	
Plasticity Index	34	
Fines Content (<#200 sieve)	95	
% finer than 2μ	42	
Fabric Factor	1	
Thornthwaite Moisture Index	-40	
Maximum Edge Moisture Variation Distance, e_m		Center: 3.7 ft. Edge: 7.2 ft.
Differential Soil Movement, y_m		Center: 0.39 in. Edge: 2.26 in.
Bearing Capacity:		1,500 psf
Maximum Allowable Slab Deflection		Center: L/480 Edge: L/720

Clamping devices and end anchors for post-tensioned tendons are susceptible to corrosion from aggressive soil and landscape water conditions. Therefore, a fully encapsulated tendon and positive end seal system is required. Torched-off ends of cables are only allowed if the flame heat does not distort the end seal for the cable clamping devices. Grease caps must form a complete seal to the cup. Apply a bonding agent to the recessed pocket area and fill with polymer modified non-shrink grout.

All exterior footings for post-tensioned slabs should be embedded a minimum of 24 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Minimum embedment depth of interior slab stiffening elements for post-tensioned slabs should be at least 12 inches into the building support pad to account for variable environmental conditions.

Interior and exterior embedment depths listed herein are minimum depths and greater depths/widths may be required by the structural engineer/designer and should be sufficient to limit differential movement to L/480 for center lift and L/720 for edge lift to comply with the current standards.

Settlements: Foundation movement under the estimated static (non-seismic) loadings and static site conditions are estimated to not exceed 1 inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed. Seismically induced liquefaction settlement of the surrounding land mass and structure may be on the order of 1 inch (total) and ¾ inch (differential).

4.3 Slabs-On-Grade

Structural Concrete: Structural concrete slabs are those slabs (foundations) that underlie structures or patio covers (shades). These slabs that are placed over native clay soil should be designed in accordance with Chapter 18 of the 2016 CBC and shall be a minimum of 5 inches thick due to expansive soil conditions. Concrete floor slabs shall be monolithically placed with the footings (no cold joints).

American Concrete Institute (ACI) guidelines (ACI 302.1R-04 Chapter 3, Section 3.2.3) provide recommendations regarding the use of moisture barriers beneath concrete slabs. The concrete floor slabs should be underlain by a 10-mil polyethylene vapor retarder that works as a capillary break to reduce moisture migration into the slab section. All laps and seams should be overlapped 6-inches or as recommended by the manufacturer. The vapor retarder should be protected from puncture. The joints and penetrations should be sealed with the manufacturer's recommended adhesive, pressure-sensitive tape, or both. The vapor retarder should extend a minimum of 12 inches into the footing excavations. The vapor retarder should be covered by 4 inches of clean sand (Sand Equivalent SE>30).

Placing sand over the vapor retarder may increase moisture transmission through the slab, because it provides a reservoir for bleed water from the concrete to collect. The sand placed over the vapor retarder may also move and mound prior to concrete placement, resulting in an irregular slab thickness.

For areas with moisture sensitive flooring materials, ACI recommends that concrete slabs be placed without a sand cover directly over the vapor retarder, provided that the concrete mix uses a low-water cement ratio and concrete curing methods are employed to compensate for release of bleed water through the top of the slab. The vapor retarder should have a minimum thickness of 15-mil (Stego-Wrap or equivalent).

Structural concrete slab reinforcement should consist of chaired rebar slab reinforcement (minimum of No. 3 bars at 16-inch centers, both horizontal directions) placed at slab mid-height to resist potential swell forces and cracking. Slab thickness and steel reinforcement are minimums only and should be verified by the structural engineer/designer knowing the actual project loadings. All steel components of the foundation system should be protected from corrosion by maintaining a 3-inch minimum concrete cover of densely consolidated concrete at footings (by use of a vibrator). The construction joint between the foundation and any mowstrips/sidewalks placed adjacent to foundations should be sealed with a polyurethane based non-hardening sealant to prevent moisture migration between the joint. Epoxy coated embedded steel components (ASTM D3963/A934) or permanent waterproofing membranes placed at the exterior footing sidewall may also be used to mitigate the corrosion potential of concrete placed in contact with native soil.

Control joints should be provided in all concrete slabs-on-grade at a maximum spacing (in feet) of 2 to 3 times the slab thickness (in inches) as recommended by American Concrete Institute (ACI) guidelines. All joints should form approximately square patterns to reduce randomly oriented contraction cracks. Contraction joints in the slabs should be tooled at the time of the pour or sawcut (¼ of slab depth) within 6 to 8 hours of concrete placement. Construction (cold) joints in foundations and area flatwork should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All joints in flatwork should be sealed to prevent moisture, vermin, or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region (refer to ACI guidelines).

Non-structural Concrete: All non-structural independent flatwork (sidewalks and uncovered patios) shall be a minimum of 4 inches thick and should be placed on a minimum of 2 inches of concrete sand or aggregate base, dowelled to the perimeter foundations where adjacent to the building to prevent separation and sloped 2% (sidewalks) or 1 to 2% (patios) away from the building.

Patio slabs with shade structures shall have a perimeter footing (18-inch embedment depth) and shall have interior grade beams (12-inch minimum embedment depth) at 15 feet on center. Planters that trap water between sidewalks and foundations are not allowed.

A minimum of 24 inches of moisture conditioned (5% minimum above optimum) and 8 inches of compacted subgrade (85 to 90%) should underlie all independent flatwork. Flatwork which contains steel reinforcing (except wire mesh) should be underlain by a 10-mil (minimum) polyethylene separation sheet and at least a 2-inch sand cover. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 8 feet or the least width of the sidewalk.

4.4 Shade Structure Foundations

Shallow spread footings or individual concrete short drilled piers are suitable to support the shade canopy structures.

Spread Footings: Spread footings may be used to support the shade canopy structures. The spread footing foundation shall be founded on a layer of properly prepared and compacted soil as described above. Spread footings should have a minimum horizontal dimension of 36 inches. Concrete reinforcement and sizing for all footings should be provided by the structural engineer.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 250 pcf to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.25 (clay) may also be used at the base of the footings to resist lateral loading. Native clay soils unit weight may be about 125 pcf for saturated unit weight. A modulus of subgrade reaction (Ks) of 150 pci may be used.

Drilled pier foundation: Individual short piers should be adequate to support the shade canopy structure. Non-constrained and constrained design parameters are provided below.

Non-constrained: Embedment depth for short piers to resist lateral loads where no-constraint is provided at ground surface may be designed using the following formula per 2019 CBC Section 1807.3.2.1:

$$d = 0.5A\,[1 + (1+4.36h/A)^{1/2}] \qquad \text{(Equation 18-1)}$$

where:

A = $2.34P/S_1b$

b = Pier diameter in feet

d = Embedment depth in feet (but not over 12 feet for purpose of computing lateral pressure)

h = Distance in feet from ground surface to point of application of "P"

P = Applied lateral force in pounds

S_1 = Allowable lateral soil bearing pressure (basic value of 100 psf/f (see 2019 CBC Table 1806.2). Isolated piers that are not adversely affected by a 0.5 inch motion at the ground surface due to short-term lateral loads are permitted to be designed using lateral soil bearing pressures equal to two times the basic soil bearing value.

The short pier foundations may be designed using an allowable soil bearing pressure of 1,500 psf for the native soils and a cohesion of 130 psf for the native clay soil. The cohesion value shall be multiplied by the contact area, as limited by Section 1806.3 of the 2019 CBC. Uplift capacity may be determined by using ⅔ of the cohesion value.

Constrained: The following formula (2019 CBC Section 1807.3.2.2) shall be used to determine the depth of embedment required to resist lateral loads where lateral constrain is provided at the ground surface, such as by rigid floor or pavement.

$$d = \sqrt{(4.25Ph / S_3b)} \text{ or alternatively, } d = \sqrt{(4.25Mg / S_3b)}$$

where:

b = Pier diameter in feet.

d = Embedment depth in feet (but not over 12 feet for purpose of computing lateral pressure).

h = Distance in feet from ground surface to point of application of "P".

P = Applied lateral force in pounds.

S_3 = Allowable lateral soil bearing pressure (basic value of 100 psf, see 2019 CBC Table 1806.2) based on a depth equal to the depth of embedment in psf. This value may be doubled where ½ inch deflection at ground surface is allowed due to short-term lateral loads.

Mg = Moment in the post at grade in ft-lb.

The vertical load capacity of short pier foundations may be designed using an allowable downward soil bearing pressure of 1,500 psf and a cohesion of 130 psf for the native clay soil. The cohesion value shall be multiplied by the contact area, as limited by Section 1806.3 of the 2019 CBC. Uplift capacity may be determined by using ⅔ of the cohesion value.

4.5 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Plate C-4). The native soils were found to have S2 (severe) levels of sulfate ion concentration (2,934 to 6,552 ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling. The following table provides American Concrete Institute (ACI) recommended cement types, water-cement ratio and minimum compressive strengths for concrete in contact with soils:

Concrete Mix Design Criteria due to Soluble Sulfate Exposure

Sulfate Exposure Class	Water-soluble Sulfate (SO_4) in soil, ppm	Cement Type	Maximum Water-Cement Ratio by weight	Minimum Strength f'c (psi)
S0	0-1,000	–	–	–
S1	1,000-2,000	II	0.50	4,000
S2	2,000-20,000	V	0.45	4,500
S3	Over 20,000	V (plus Pozzolon)	0.45	4,500

Note: From ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

A minimum of 6.0 sacks per cubic yard of concrete (4,500 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.45 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including streets, sidewalks, driveways, patios, and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete. Thorough concrete consolidation and hard trowel finishes should be used due to the aggressive soil exposure.

The native soil has severe to very severe levels of chloride ion concentration (700 to 2,320 ppm). Chloride ions can cause corrosion of reinforcing steel, anchor bolts and other buried metallic conduits. Resistivity determinations on the soil indicate very severe potential for metal loss because of electrochemical corrosion processes.

Mitigation of the corrosion of steel can be achieved by using steel pipes coated with epoxy corrosion inhibitors, asphaltic and epoxy coatings, cathodic protection or by encapsulating the portion of the pipe lying above groundwater with a minimum of 3 inches of densely consolidated concrete. ***No metallic water pipes or conduits should be placed below foundations.***

Foundation designs shall provide a minimum concrete cover of three (3) inches around steel reinforcing or embedded components (anchor bolts, etc.) exposed to native soil or landscape water (to 18 inches above grade). If the 3-inch concrete edge distance cannot be achieved, all embedded steel components (anchor bolts, etc.) shall be epoxy coated for corrosion protection (in accordance with ASTM D3963/A934) or a corrosion inhibitor and a permanent waterproofing membrane shall be placed along the exterior face of the exterior footings. ***Hold-down straps should not be used at foundation edges due to corrosion of metal at its protrusion from the slab edge.*** Additionally, the concrete should be thoroughly vibrated at footings during placement to decrease the permeability of the concrete.

Exterior foundation faces exposed to native soils (without adjacent mowstrips, sidewalks, or patios) should be coated with a permanent waterproofing membrane to prevent salt migration into concrete.

Copper water piping (except for trap primers) should not be placed under floor slabs. All copper piping within 18 inches of ground surface shall be sleeved or wrapped with two layers of 10 mil plumbers tape or sleeved with PVC piping to prevent contact with soil. The trap primer pipe shall be completely encapsulated in a PVC sleeve and Type K copper should be utilized if polyethylene tubing cannot be used. Pressurized waterlines are not allowed under the floor slab. Fire protection piping (risers) should be placed outside of the building foundation.

Landmark does not practice corrosion engineering. We recommend that a qualified corrosion engineer evaluate the corrosion potential on metal construction materials and concrete at the site to obtain final design recommendations.

4.6 Excavations

All site excavations should conform to CalOSHA requirements for Type B soil. The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be cut nearly vertical for short duration. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type B soil. Surcharge loads of stockpiled soil or construction materials should be set back from the top of the slope a minimum distance equal to the height of the slope. All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

4.7 Utility Trench Backfill

Utility Trench Backfill: Prior to placement of utility bedding, the exposed subgrade at the bottom of trench excavations should be examined for soft, loose, or unstable soil. Loose materials at trench bottoms resulting from excavation disturbance should be removed to firm material. If extensive soft or unstable areas are encountered, these areas should be over-excavated to a depth of at least 2 feet or to a firm base and be replaced with additional bedding material.

Backfill Materials: Pipe zone backfill (i.e., material beneath and in the immediate vicinity of the pipe) should consist of a 4 to 8 inch bed of ⅜-inch crushed rock, sand/cement slurry (3 sack cement factor), and/or crusher fines (sand) extending to a minimum of 12 inches above the top of pipe. If crushed rock is used for pipe zone backfill for utilities, the crushed rock material should be completed surrounded by a non-woven filter fabric such as Mirafi 140N or equivalent. The filter fabric shall cover the trench bottom, sidewalls and over the top of the crushed rock. The filter fabric is recommended to inhibit the migration of fine material into void spaces in the crushed rock which may create the potential for sinkholes or depressions to develop at the ground surface.

Pipe bedding should be in accordance with pipe manufacturer's recommendations. Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipes.

On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill above pipezone, but may be difficult to uniformly maintain at specified moistures and compact to the specified densities. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

Compaction Criteria: Mechanical compaction is recommended; ponding or jetting should not be allowed, especially in areas supporting structural loads or beneath concrete slabs supported-on-grade, pavements, or other improvements. All trench backfill should be placed and compacted in accordance with recommendations provided above for engineered fill.

The pipe zone material (crusher fines, sand) shall be compacted to a minimum of 95% of ASTM D1557 maximum density. Pipe deflection should be checked to not exceed 2% of pipe diameter. Native clay/silt soils may be used to backfill the remainder of the trench. Soils used for trench backfill shall be placed in maximum 6 inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at a minimum of 4% above optimum moisture.

Imported granular material is acceptable for backfill of utility trenches. Granular trench backfill used in building pad areas should be plugged with a solid (no clods or voids) 2-foot width of native clay soils at each end of the building foundation to prevent landscape water migration into the trench below the building.

Backfill soil of utility trenches within paved areas should be uniformly moisture conditioned to a minimum of 4% above optimum moisture, placed in layers not more than 6 inches in thickness and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density, except that the top 12 inches shall be compacted to 95% (if granular trench backfill).

4.8 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the Brawley, Superstition Hills, and Imperial faults. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Site Class D using the seismic coefficients given in Section 3.6 and Table 2 of this report.

4.9 Pavements

Pavements should be designed according to the 2020 Caltrans Highway Design Manual or other acceptable methods. Traffic indices were not provided by the project engineer or owner; therefore, we have provided structural sections for several traffic indices for comparative evaluation. The public agency or design engineer should decide the appropriate traffic index for the site. Maintenance of proper drainage is necessary to prolong the service life of the pavements. Based on the current Caltrans method, an estimated R-value of 5 for the subgrade soil and assumed traffic indices, the following table provides our estimates for asphaltic concrete (AC) and Portland Cement Concrete (PCC) pavement sections.

Pavement Structural Sections

R-Value of Subgrade Soil - 5 (estimated) Design Method - Caltrans 2020

Traffic Index	Flexible Pavements		Rigid (PCC) Pavements	
	Asphaltic Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Concrete Thickness (in.)	Aggregate Base Thickness (in.)
4.0	3.0	6.5	5.0	6.0
5.0	3.0	10.0	5.5	6.0
6.0	4.0	11.5	6.0	8.0
6.5	4.0	14.0	7.0	8.0

Notes:

1) Asphaltic concrete shall be Caltrans, Type A HMA (Hot Mix Asphalt), ¾ inch maximum (½ inch maximum for parking areas), with PG70-10 asphalt concrete, compacted to a minimum of 95% of the Hveem density (CAL 308) or a minimum of 92% of the Maximum Theoretical Density (ASTM D2041).
2) Aggregate base shall conform to Caltrans Class 2 (¾ in. maximum), compacted to a minimum of 95% of ASTM D1557 maximum dry density.
3) Place pavements on 12 inches of moisture conditioned (minimum 4% above optimum if clays) native clay soil compacted to a minimum of 90% (95% if sand subgrade) of the maximum dry density determined by ASTM D1557. Prewetting of subgrade soils (to 3.5 feet) may be required depending on moisture of subgrade at time of aggregate base placement.
4) Portland cement concrete for pavements should have Type V cement, a minimum compressive strength of 4,500 psi at 28 days, and a maximum water-cement ratio of 0.45.
5) Typical Street Classifications (Imperial County).
   - Parking Areas: TI = 4.0
   - Cul-de-Sacs: TI = 5.0
   - Local Streets: TI = 6.0
   - Minor Collectors: TI = 6.5 (trash truck areas)

Section 5
LIMITATIONS AND ADDITIONAL SERVICES

5.1 Limitations

The findings and professional opinions within this report are based on current information regarding the proposed Heber Meadows apartment complex located on a 16.5 acre parcel at the southwest corner of Correll Road and Pitzer Road in northeastern Heber, California. The conclusions and professional opinions of this report are invalid if:

- Structural loads change from those stated or the structures are relocated.
- The Additional Services section of this report is not followed.
- This report is used for adjacent or other property.
- Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- Any other change that materially alters the project from that proposed at the time this report was prepared.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Imperial County at the time the report was prepared. No express or implied warranties are made in connection with our services.

Findings and professional opinions in this report are based on selected points of field exploration, geologic literature, limited laboratory testing, and our understanding of the proposed project. Our analysis of data and professional opinions presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. The nature and extend of such variations may not become evident until, during or after construction. If variations are detected, we should immediately be notified as these conditions may require additional studies, consultation, and possible design revisions.

Environmental or hazardous materials evaluations were not performed by Landmark for this project. Landmark will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

The client has responsibility to see that all parties to the project including designer, contractor, and subcontractor are made aware of this entire report within a reasonable time from its issuance. This report should be considered invalid for periods after two years from the date of report issuance without a review of the validity of the findings and professional opinions by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice. This report is based upon government regulations in effect at the time of preparation of this report. Future changes or modifications to these regulations may require modification of this report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify Landmark of such intended use. Based on the intended use of the report, Landmark may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Landmark from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Landmark harmless from any claim or liability associated with such unauthorized use or non-compliance.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded is such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 Plan Review

Landmark Consultants, Inc. should be retained during development of design and construction documents to check that the geotechnical professional opinions are appropriate for the proposed project and that the geotechnical professional opinions are properly interpreted and incorporated into the documents. Landmark should have the opportunity to review the final design plans and specifications for the project prior to the issuance of such for bidding.

Governmental agencies may require review of the plans by the geotechnical engineer of record for compliance to the geotechnical report.

5.3 Additional Services

We recommend that Landmark Consultant be retained to provide the tests and observations services during construction. *The geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

Landmark Consultants, Inc. professional opinions for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the findings and professional opinions in this report are made contingent upon the opportunity for Landmark Consultants to observe grading operations and foundation excavations for the proposed construction.

If parties other than Landmark Consultants, Inc. are engaged to provide observation and testing services during construction, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the professional opinions in this report and/or by providing alternative professional guidance.

Additional information concerning the scope and cost of these services can be obtained from our office.

Section 6
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TABLES

Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Imperial	5.2	8.3	7	62 ± 6	20 ± 5
Brawley *	6.9	11.0			
Superstition Hills	7.7	12.3	6.6	23 ± 2	4 ± 2
Rico *	8.1	13.0			
Unnamed 2*	10.0	16.0			
Unnamed 1*	13.0	20.8			
Superstition Mountain	14.1	22.6	6.6	24 ± 2	5 ± 3
Yuha*	14.5	23.1			
Borrego (Mexico)*	14.9	23.8			
Cerro Prieto *	16.4	26.3			
Laguna Salada	16.7	26.7	7	67 ± 7	3.5 ± 1.5
Shell Beds	18.1	29.0			
Yuha Well *	18.6	29.8			
Pescadores (Mexico)*	18.9	30.2			
Cucapah (Mexico)*	19.9	31.9			
Vista de Anza*	21.5	34.5			
Painted Gorge Wash*	24.4	39.1			
Ocotillo*	26.3	42.0			
Elmore Ranch	27.8	44.5	6.6	29 ± 3	1 ± 0.5
Elsinore - Coyote Mountain	29.9	47.9	6.8	39 ± 4	4 ± 2
San Jacinto - Borrego	33.5	53.6	6.6	29 ± 3	4 ± 2
Algodones *	34.2	54.8			

* Note: Faults not included in CGS database.

Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters

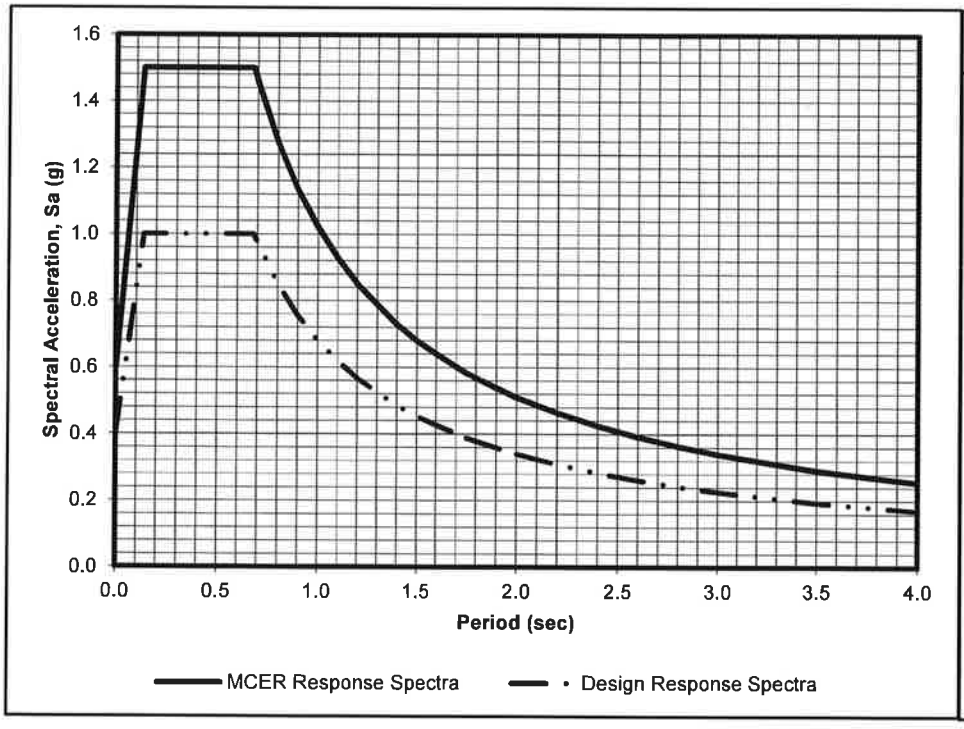
		ASCE 7-16 Reference
Soil Site Class:	D	Table 20.3-1
Latitude:	32.7370 N	
Longitude:	-115.5193 W	
Risk Category:	II	
Seismic Design Category:	D	

Maximum Considered Earthquake (MCE) Ground Motion

Mapped MCE_R Short Period Spectral Response	S_s	1.500 g	ASCE Figure 22-1	
Mapped MCE_R 1 second Spectral Response	S_1	0.600 g	ASCE Figure 22-2	
Short Period (0.2 s) Site Coefficient	F_a	1.00	ASCE Table 11.4-1	
Long Period (1.0 s) Site Coefficient	F_v	1.70	ASCE Table 11.4-2	
MCE_R Spectral Response Acceleration Parameter (0.2 s)	S_{MS}	1.500 g	= Fa * S_s	ASCE Equation 11.4-1
MCE_R Spectral Response Acceleration Parameter (1.0 s)	S_{M1}	1.020 g	= Fv * S_1	ASCE Equation 11.4-2

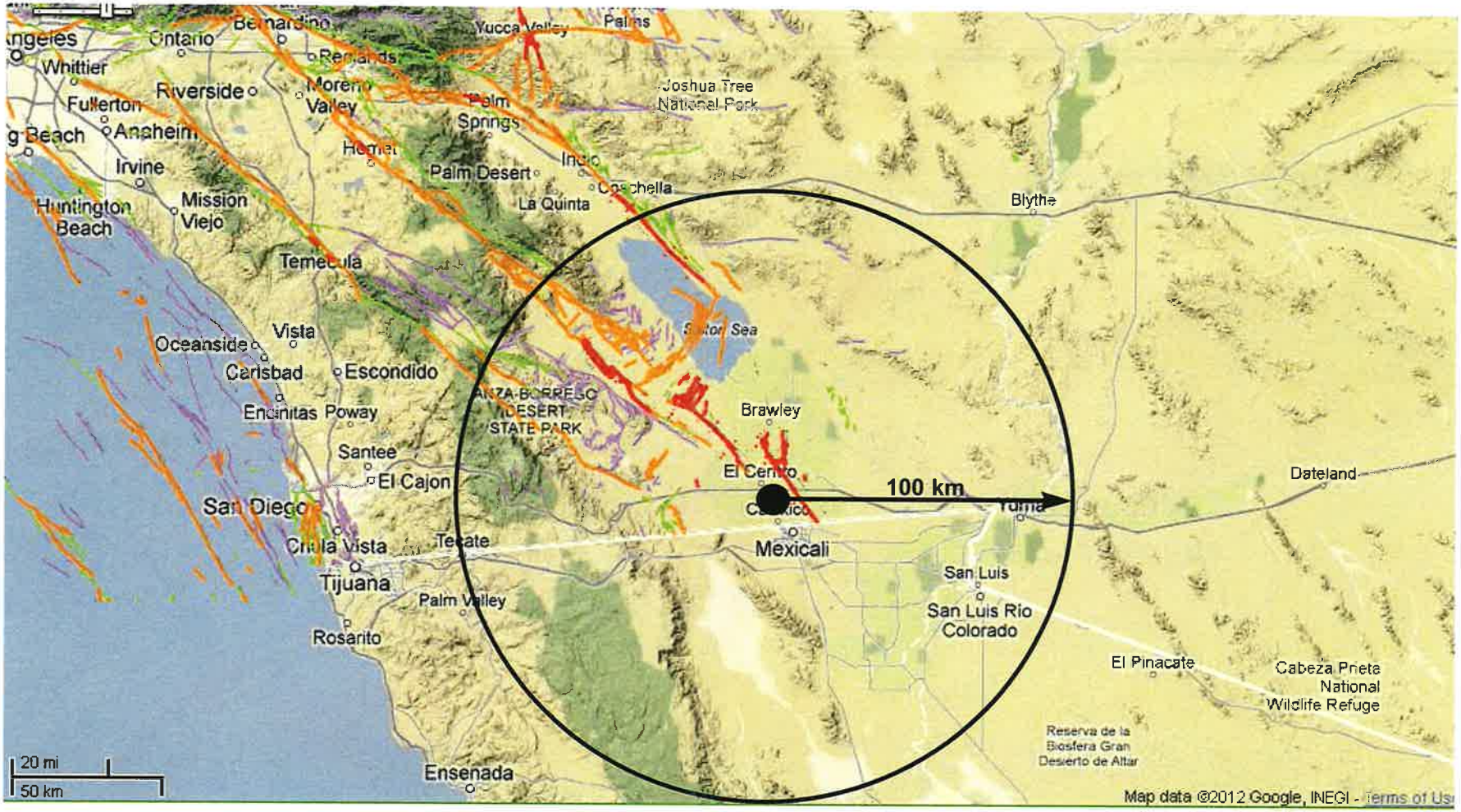
Design Earthquake Ground Motion

Design Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	1.000 g	= 2/3*S_{MS}	ASCE Equation 11.4-3
Design Spectral Response Acceleration Parameter (1.0 s)	S_{D1}	0.680 g	= 2/3*S_{M1}	ASCE Equation 11.4-4
Risk Coefficient at Short Periods (less than 0.2 s)	C_{RS}	0.955		ASCE Figure 22-17
Risk Coefficient at Long Periods (greater than 1.0 s)	C_{R1}	0.927		ASCE Figure 22-18
	T_L	8.00 sec		ASCE Figure 22-12
	T_O	0.14 sec	=0.2*S_{D1}/S_{DS}	
	T_S	0.68 sec	=S_{D1}/S_{DS}	
Peak Ground Acceleration	PGA_M	0.60 g		ASCE Equation 11.8-1



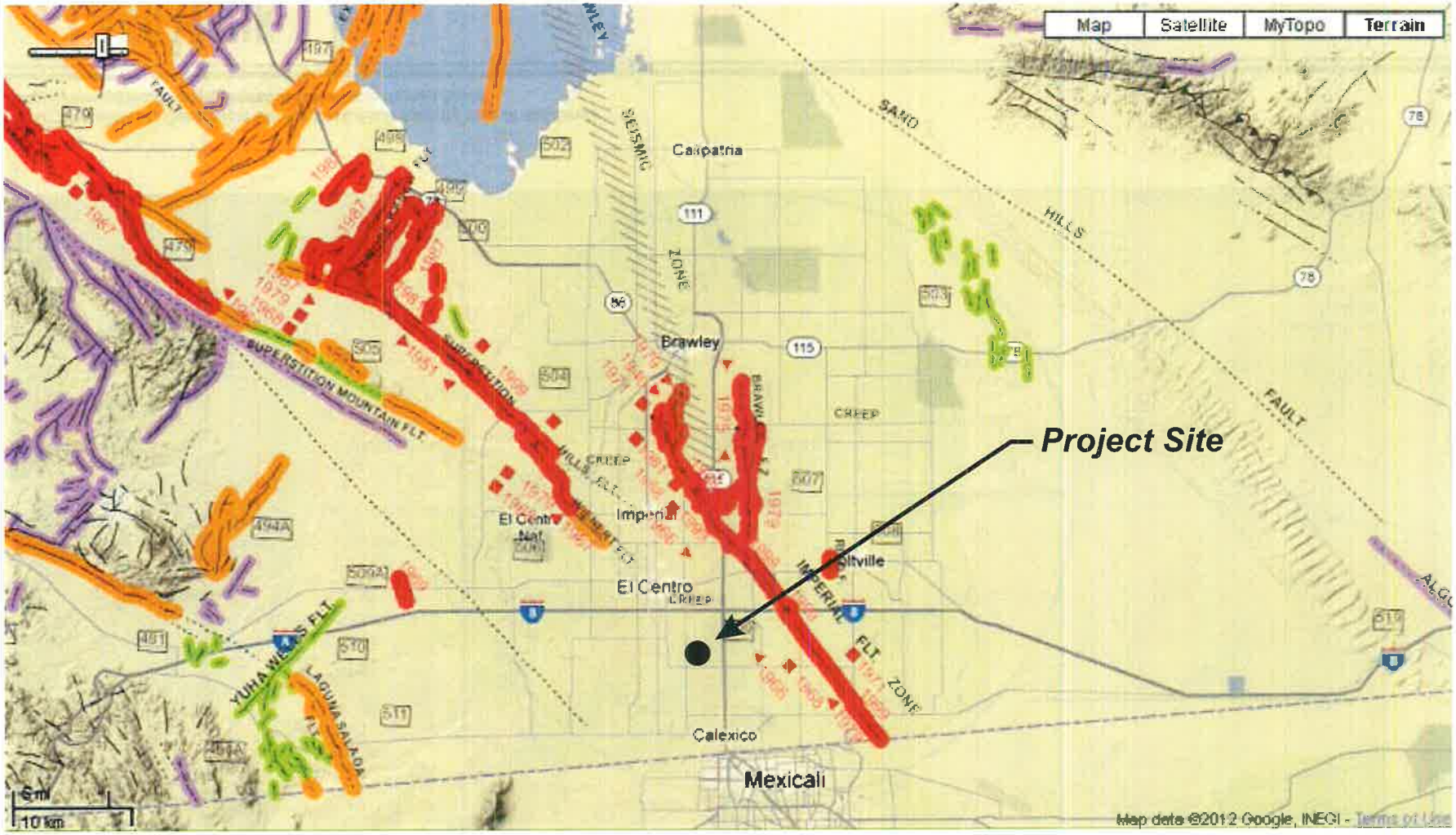
Period T (sec)	Sa (g)	MCE_R Sa (g)
0.00	0.40	0.60
0.14	1.00	1.50
0.68	1.00	1.50
0.70	0.97	1.46
0.80	0.85	1.28
0.90	0.76	1.13
1.00	0.68	1.02
1.10	0.62	0.93
1.20	0.57	0.85
1.20	0.57	0.85
1.40	0.49	0.73
1.50	0.45	0.68
1.75	0.39	0.58
2.00	0.34	0.51
2.20	0.31	0.46
2.40	0.28	0.43
2.60	0.26	0.39
2.80	0.24	0.36
3.00	0.23	0.34
3.50	0.19	0.29
4.00	0.17	0.26

FIGURES



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists **Project No.: LE20178**	**Regional Fault Map**	**Figure 1**



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

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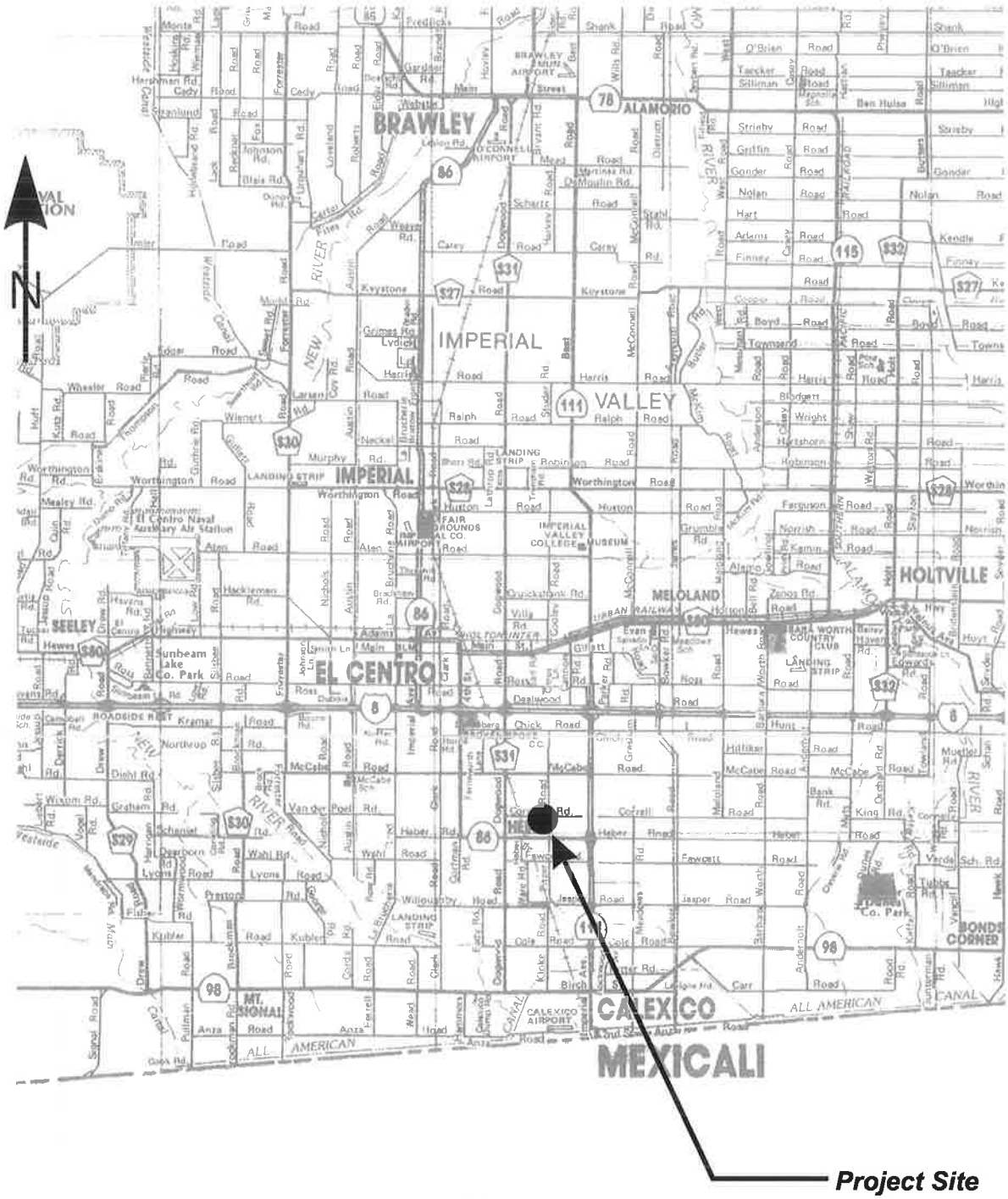
Map of Local Faults

Figure 2

APPENDIX A



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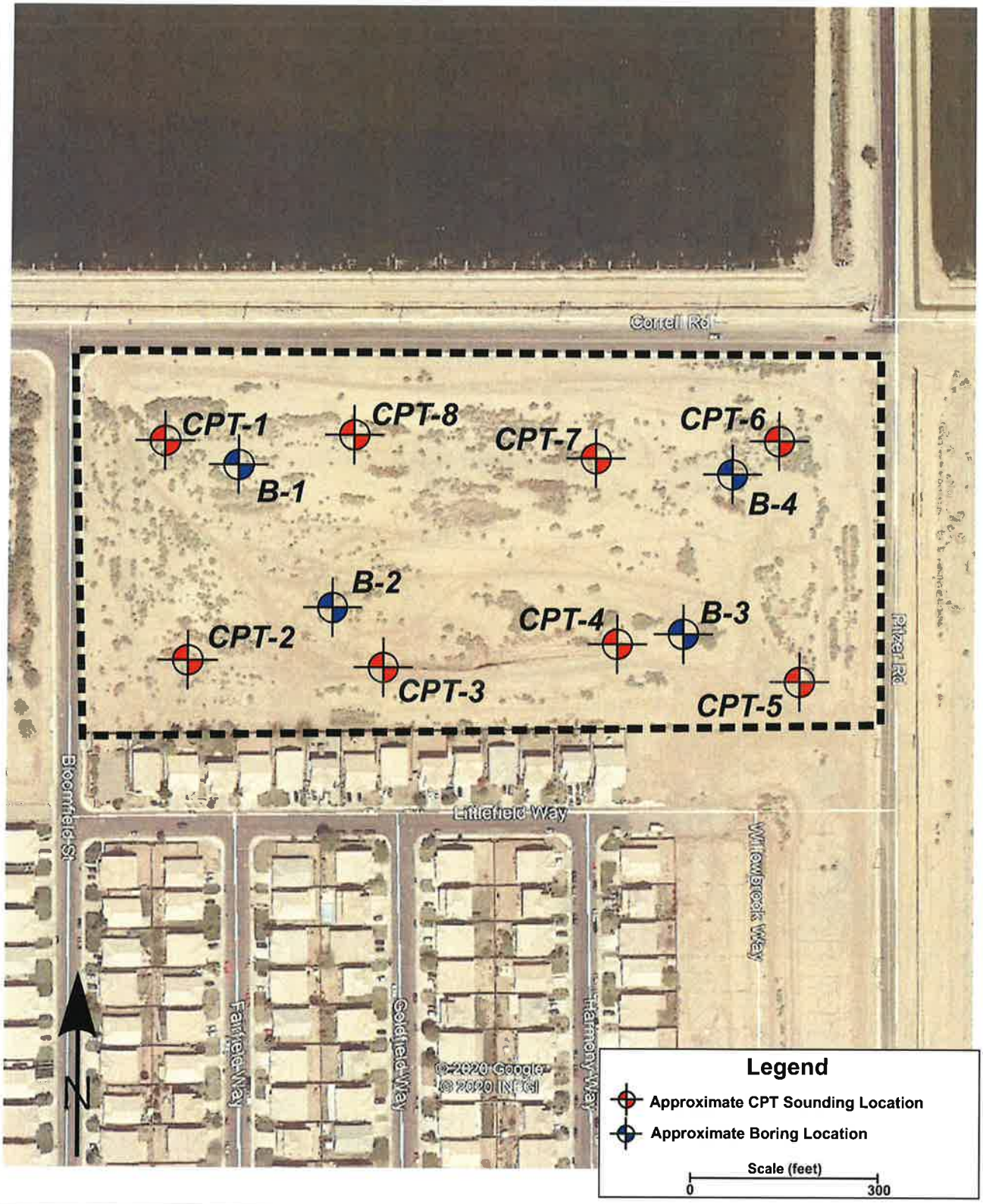
Vicinity Map

Plate A-1



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Site and Exploration Map

Plate A-2

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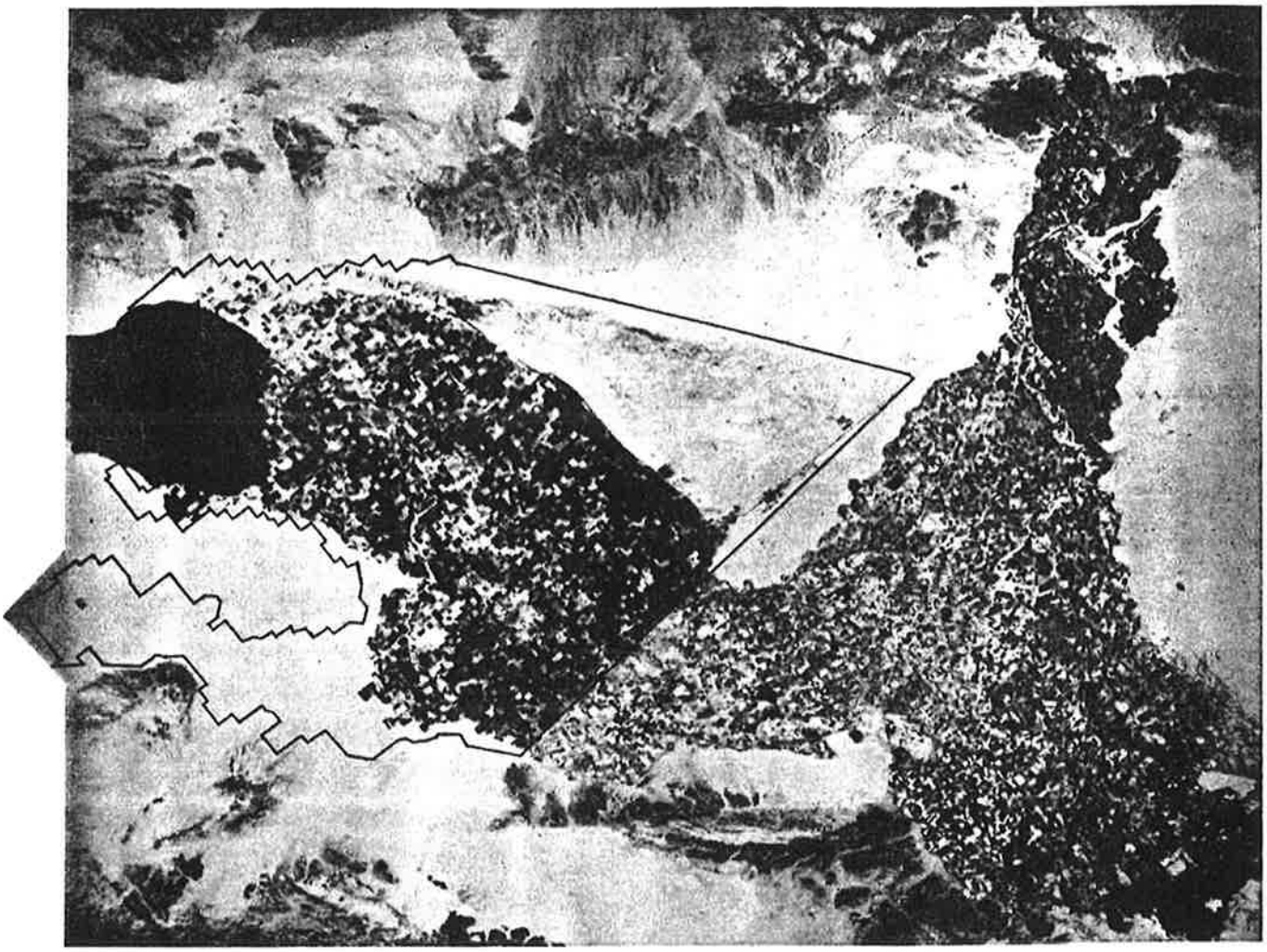
Soil Survey Map

Plate A-3

Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100----------	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
Antho	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho----------	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition------	0-6	Fine sand--------	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103----------	0-10	Gravelly sand---	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
Carsitas	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105----------	0-13	Clay loam--------	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
Glenbar	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106----------	0-13	Clay loam--------	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
Glenbar	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107*----------	0-13	Loam------------	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
Glenbar	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108----------	0-14	Loam------------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
Holtville	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109----------	0-17	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Holtville	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110----------	0-17	Silty clay------	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
Holtville	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*:											
Holtville	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Indio	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*	0-12	Loam	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
Laveen	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

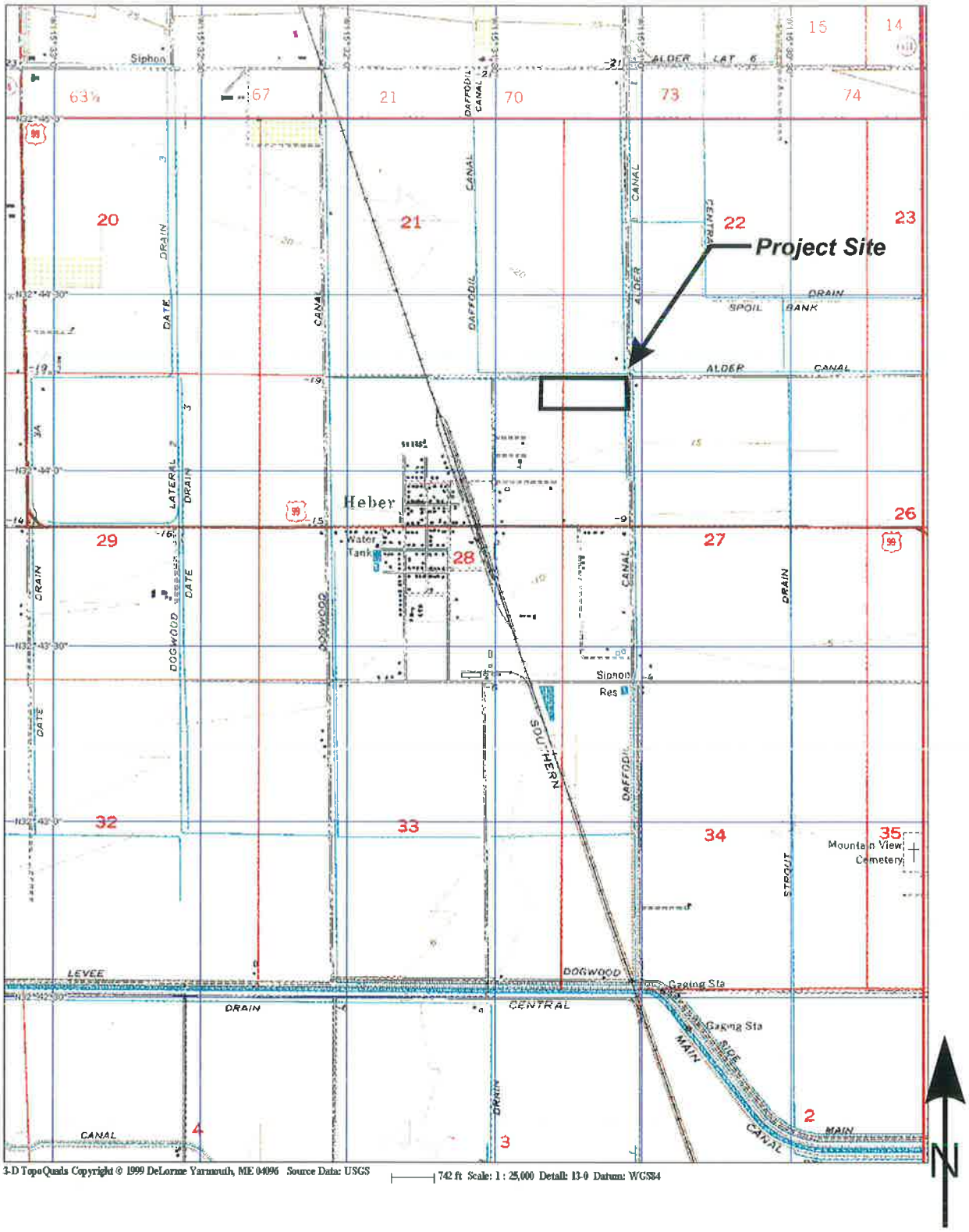
Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
121---------- Meloland	0-12	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122---------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*: Meloland----------	0-12	Loam----------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125---------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126---------- Niland	0-23	Fine sand-------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127---------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*: Niland----------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131---------- Rositas	0-27	Sand----------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133, 134, 135--Rositas	0-9	Fine sand	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136--Rositas	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137--Rositas	0-12	Silt loam	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139--Superstition	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142--Vint	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143--Vint	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

742 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84

LANDMARK
Geo-Engineers and Geologists

Project No.: LE20178

Topographic Map

Plate A-4

APPENDIX B

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

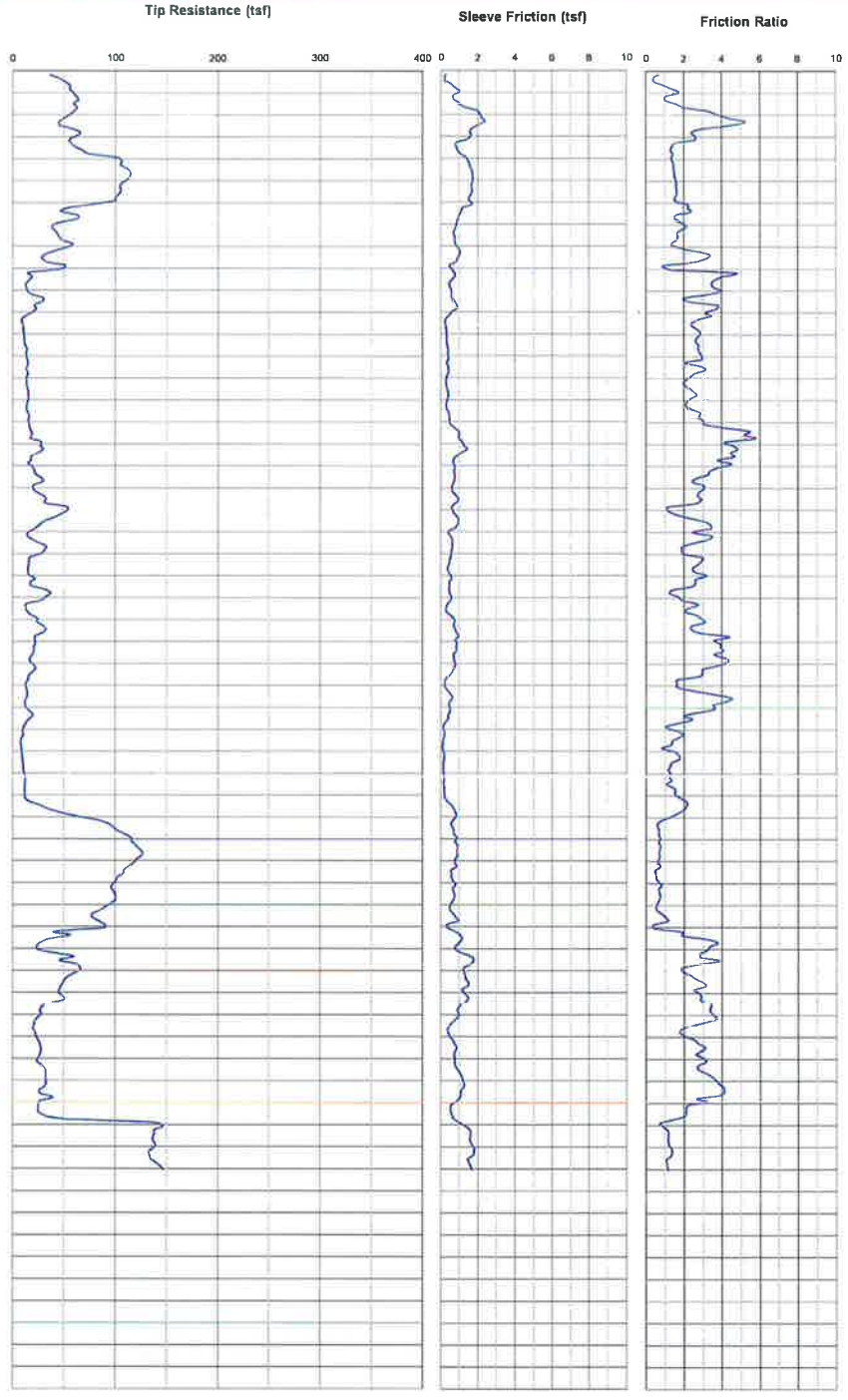
CONE SOUNDING DATA CPT-1

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

DEPTH			
	Silty Sand to Sandy Silt	SM/ML	very dense
	Silty Sand to Sandy Silt	" "	very dense
	Clayey Silt to Silty Clay	ML/CL	hard
	Silty Sand to Sandy Silt	SM/ML	dense
	Sand to Silty Sand	SP/SM	very dense
5	Silty Sand to Sandy Silt	SM/ML	dense
	Silty Sand to Sandy Silt	" "	medium dense
	Silty Sand to Sandy Silt	" "	medium dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Silty Clay to Clay	CL	stiff
10	Clayey Silt to Silty Clay	ML/CL	very stiff
	Silty Clay to Clay	CL	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
15	Clayey Silt to Silty Clay	" "	stiff
	Clay	CL/CH	very stiff
	Silty Clay to Clay	CL	very stiff
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sandy Silt to Clayey Silt	ML	medium dense
20	Sandy Silt to Clayey Silt	" "	loose
	Sandy Silt to Clayey Silt	" "	loose
	Clayey Silt to Silty Clay	ML/CL	stiff
	Sandy Silt to Clayey Silt	ML	loose
	Clayey Silt to Silty Clay	ML/CL	very stiff
25	Clayey Silt to Silty Clay	" "	very stiff
	Silty Clay to Clay	CL	very stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Silty Clay to Clay	CL	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
30	Clayey Silt to Silty Clay	" "	firm
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Sandy Silt to Clayey Silt	ML	loose
	Sand	SP	medium dense
35	Sand	" "	dense
	Sand	" "	dense
	Sand	" "	medium dense
	Sand to Silty Sand	SP/SM	medium dense
	Sandy Silt to Clayey Silt	ML	loose
40	Sandy Silt to Clayey Silt	" "	medium dense
	Sandy Silt to Clayey Silt	" "	medium dense
	Clayey Silt to Silty Clay	ML/CL	hard
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
45	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Sand to Silty Sand	SP/SM	dense
50	Sand to Silty Sand	" "	dense
55			

END OF SOUNDING AT 50 ft.



Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-1

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-1

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: 17 Phi (deg.)	Su (tsf)	OCR
0.15	0.5	44.02	0.52	Sand to Silty Sand	SP/SM	very dense	115	8	83.2	20	110	43		
0.30	1.0	56.55	1.32	Silty Sand to Sandy Silt	SM/ML	very dense	115	13	106.9	30	101	42		
0.45	1.5	61.62	1.18	Silty Sand to Sandy Silt	SM/ML	very dense	115	14	116.5	25	96	41		
0.60	2.0	59.31	2.99	Sandy Silt to Clayey Silt	ML	very dense	115	17	112.1	45	90	41		
0.75	2.5	46.99	4.67	Silty Clay to Clay	CL	hard	125	27		60			2.76	>10
0.93	3.0	61.71	2.62	Sandy Silt to Clayey Silt	ML	dense	115	18	116.7	40	84	40		
1.08	3.5	57.31	1.79	Silty Sand to Sandy Silt	SM/ML	dense	115	13	108.3	35	80	39		
1.23	4.0	81.41	1.34	Sand to Silty Sand	SP/SM	dense	115	15	153.9	20	88	40		
1.38	4.5	107.06	1.42	Sand to Silty Sand	SP/SM	very dense	115	19	202.4	20	94	41		
1.53	5.0	113.35	1.50	Sand to Silty Sand	SP/SM	very dense	115	21	209.9	20	94	41		
1.68	5.5	104.91	1.58	Silty Sand to Sandy Silt	SM/ML	very dense	115	23	184.9	20	91	41		
1.83	6.0	92.01	1.75	Silty Sand to Sandy Silt	SM/ML	dense	115	20	155.0	25	85	40		
1.98	6.5	54.41	2.04	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	87.9	35	69	38		
2.13	7.0	49.20	1.81	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	76.5	35	65	37		
2.28	7.5	42.65	1.69	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	64.0	35	59	36		
2.45	8.0	52.94	1.52	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	76.9	30	65	37		
2.60	8.5	32.83	3.01	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		55			1.90	>10
2.75	9.0	43.35	1.54	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	61.1	35	58	36		
2.90	9.5	16.58	4.12	Silty Clay to Clay	CL	stiff	125	9		85			0.95	>10
3.05	10.0	13.23	3.67	Silty Clay to Clay	CL	stiff	125	8		90			0.75	>10
3.20	10.5	25.34	2.48	Sandy Silt to Clayey Silt	ML	medium dense	115	7	34.2	60	41	34		
3.35	11.0	20.76	3.53	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		75			1.19	>10
3.50	11.5	10.08	2.85	Silty Clay to Clay	CL	stiff	125	6		100			0.56	8.41
3.65	12.0	10.23	2.71	Silty Clay to Clay	CL	stiff	125	6		100			0.57	8.27
3.80	12.5	11.35	2.68	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.63	>10
3.95	13.0	13.14	2.82	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.74	>10
4.13	13.5	14.18	2.57	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.80	>10
4.28	14.0	13.78	2.64	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		90			0.77	>10
4.43	14.5	13.57	2.07	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		85			0.76	>10
4.58	15.0	15.18	2.45	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.85	>10
4.73	15.5	13.54	2.19	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		85			0.76	>10
4.88	16.0	15.46	2.90	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		90			0.87	>10
5.03	16.5	17.63	4.92	Clay	CL/CH	stiff	125	14		100			1.00	>10
5.18	17.0	23.83	4.82	Clay	CL/CH	very stiff	125	19		90			1.36	>10
5.33	17.5	24.13	4.63	Clay	CL/CH	very stiff	125	19		90			1.38	>10
5.48	18.0	17.52	4.02	Silty Clay to Clay	CL	stiff	125	10		100			0.99	>10
5.65	18.5	23.74	3.09	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		80			1.35	>10
5.80	19.0	23.28	2.82	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		80			1.32	>10
5.95	19.5	28.65	2.80	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		70			1.64	>10
6.10	20.0	45.78	1.63	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	49.8	45	52	35		
6.25	20.5	39.37	2.27	Sandy Silt to Clayey Silt	ML	medium dense	115	11	42.5	60	47	35		
6.40	21.0	21.43	3.07	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		85			1.21	>10
6.55	21.5	18.88	3.07	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		95			1.06	>10
6.70	22.0	30.42	1.91	Sandy Silt to Clayey Silt	ML	loose	115	9	32.0	65	39	33		
6.85	22.5	16.18	2.86	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.90	>10
7.00	23.0	15.18	2.72	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.84	>10
7.18	23.5	18.97	2.55	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		90			1.06	>10
7.33	24.0	33.42	1.44	Silty Sand to Sandy Silt	SM/ML	medium dense	115	7	34.0	55	41	34		
7.48	24.5	17.88	2.31	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		90			1.00	>10
7.63	25.0	18.27	2.51	Clayey Silt to Silty Clay	ML/CL	very stiff	120	7		95			1.02	>10
7.78	25.5	28.23	2.62	Sandy Silt to Clayey Silt	ML	loose	115	8	28.1	80	35	33		
7.93	26.0	24.22	3.59	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		95			1.37	>10
8.08	26.5	20.70	3.87	Silty Clay to Clay	CL	very stiff	125	12		100			1.16	>10
8.23	27.0	18.02	4.09	Silty Clay to Clay	CL	very stiff	125	10		100			1.00	8.27
8.38	27.5	18.83	2.93	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.05	>10
8.53	28.0	13.66	1.61	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.74	6.65
8.68	28.5	13.93	3.47	Silty Clay to Clay	CL	stiff	125	8		100			0.76	4.89
8.85	29.0	12.39	3.78	Clay	CL/CH	stiff	125	10		100			0.67	3.21
9.00	29.5	17.67	2.39	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		100			0.98	>10
9.15	30.0	11.23	1.41	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.60	4.37
9.30	30.5	9.11	1.68	Clayey Silt to Silty Clay	ML/CL	firm	120	4		100			0.47	3.14
9.45	31.0	8.41	1.21	Clayey Silt to Silty Clay	ML/CL	firm	120	3		100			0.43	2.73
9.60	31.5	9.48	1.59	Clayey Silt to Silty Clay	ML/CL	firm	120	4		100			0.49	3.21
9.75	32.0	10.44	1.23	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.55	3.58
9.90	32.5	12.17	1.20	Sandy Silt to Clayey Silt	ML	very loose	115	3	11.0	100	7	29		
10.05	33.0	11.63	1.49	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.62	4.09
10.20	33.5	18.85	2.04	Sandy Silt to Clayey Silt	ML	very loose	115	5	16.8	100	20	31		
10.38	34.0	47.96	1.66	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	42.6	55	47	35		
10.53	34.5	90.97	0.68	Sand to Silty Sand	SP/SM	medium dense	115	17	80.3	25	66	37		
10.68	35.0	109.01	0.70	Sand	SP	dense	110	17	95.7	25	71	38		
10.83	35.5	119.54	0.71	Sand	SP	dense	110	18	104.5	20	74	38		
10.98	36.0	124.03	0.68	Sand	SP	dense	110	19	107.9	20	75	38		
11.13	36.5	111.58	0.61	Sand	SP	dense	110	17	96.6	20	71	38		
11.28	37.0	99.78	0.67	Sand to Silty Sand	SP/SM	medium dense	115	18	86.0	25	68	38		
11.43	37.5	98.41	0.70	Sand to Silty Sand	SP/SM	medium dense	115	18	84.4	25	67	37		
11.58	38.0	96.32	0.60	Sand	SP	medium dense	110	15	82.2	25	67	37		
11.73	38.5	80.78	0.81	Sand to Silty Sand	SP/SM	medium dense	115	15	68.6	35	61	37		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-1

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
11.88	39.0	87.54	0.65	Sand to Silty Sand	SP/SM	medium dense	115	16	73.9	30	64	37		
12.05	39.5	44.10	2.33	Sandy Silt to Clayey Silt	ML	medium dense	115	13	37.1	70	43	34		
12.20	40.0	25.26	3.45	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		100			1.41	>10
12.35	40.5	49.02	3.17	Sandy Silt to Clayey Silt	ML	medium dense	115	14	40.8	75	46	34		
12.50	41.0	64.22	2.15	Silty Sand to Sandy Silt	SM/ML	medium dense	115	14	53.2	60	54	36		
12.65	41.5	52.91	2.61	Sandy Silt to Clayey Silt	ML	medium dense	115	15	43.6	70	48	35		
12.80	42.0	46.26	2.80	Sandy Silt to Clayey Silt	ML	medium dense	115	13	37.9	75	44	34		
12.95	42.5	44.47	3.07	Sandy Silt to Clayey Silt	ML	medium dense	115	13	36.3	80	43	34		
13.10	43.0	27.71	3.42	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.55	>10
13.25	43.5	22.19	3.00	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.22	8.56
13.40	44.0	21.61	1.91	Sandy Silt to Clayey Silt	ML	loose	115	6	17.4	100	21	31		
13.58	44.5	26.17	2.81	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		100			1.45	>10
13.73	45.0	26.59	2.85	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.48	>10
13.88	45.5	27.96	2.87	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.56	>10
14.03	46.0	32.51	3.39	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		100			1.82	>10
14.18	46.5	30.17	4.00	Silty Clay to Clay	CL	very stiff	125	17		100			1.68	9.79
14.33	47.0	29.80	3.01	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		100			1.66	>10
14.48	47.5	26.77	2.09	Sandy Silt to Clayey Silt	ML	loose	115	8	20.8	95	26	32		
14.63	48.0	111.89	1.02	Sand to Silty Sand	SP/SM	medium dense	115	20	86.7	35	68	38		
14.78	48.5	137.78	1.16	Sand to Silty Sand	SP/SM	dense	115	25	106.3	30	74	38		
14.93	49.0	137.84	1.22	Sand to Silty Sand	SP/SM	dense	115	25	105.9	30	74	38		
15.10	49.5	133.77	1.25	Sand to Silty Sand	SP/SM	dense	115	24	102.4	35	73	38		
15.25	50.0	143.16	1.12	Sand to Silty Sand	SP/SM	dense	115	26	109.1	30	75	39		

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

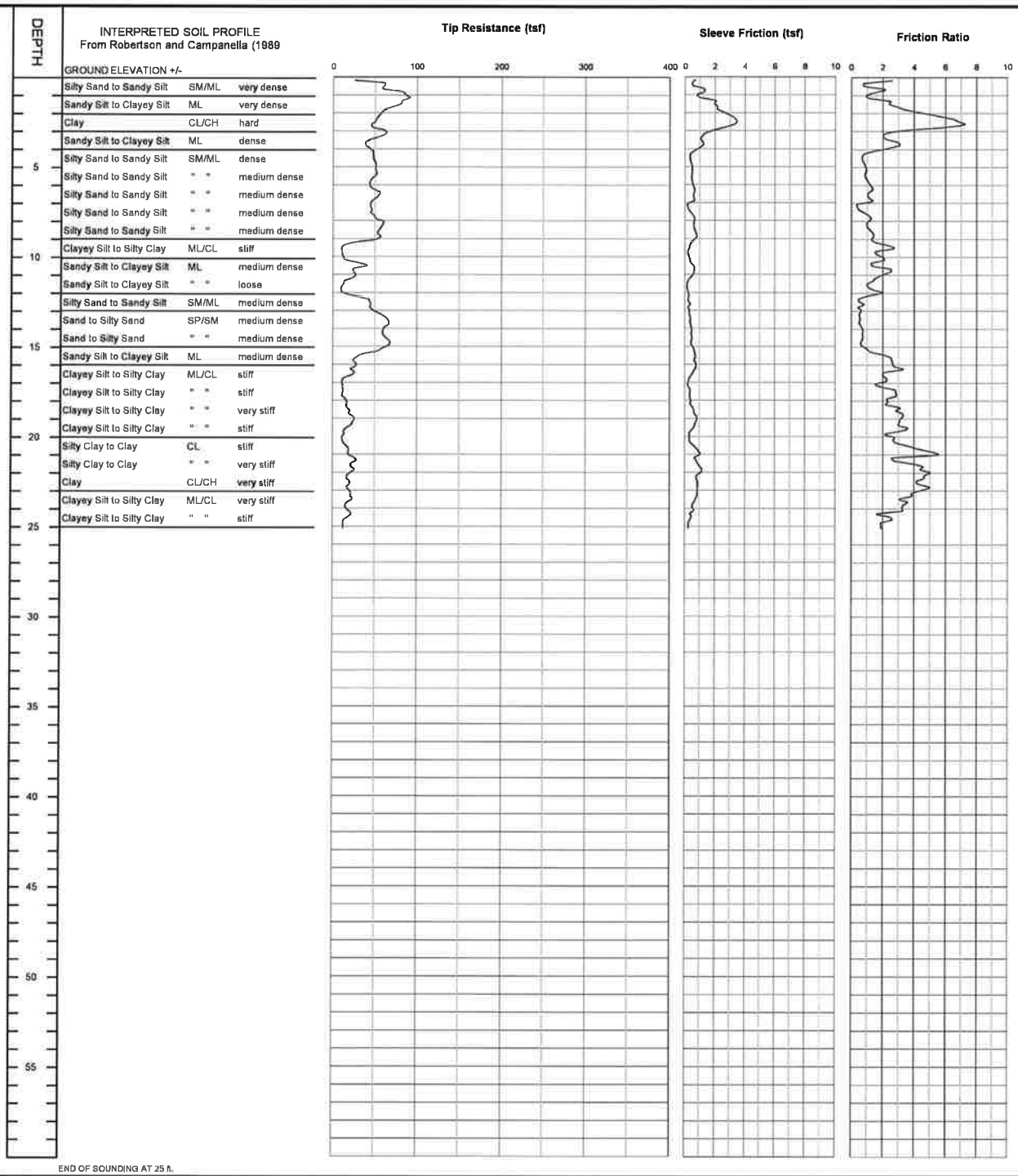
DATE: 11/17/2020

CONE SOUNDING DATA CPT-2

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Silty Sand to Sandy Silt	SM/ML	very dense
Sandy Silt to Clayey Silt	ML	very dense
Clay	CL/CH	hard
Sandy Silt to Clayey Silt	ML	dense
Silty Sand to Sandy Silt	SM/ML	dense
Silty Sand to Sandy Silt	" "	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sandy Silt to Clayey Silt	" "	loose
Silty Sand to Sandy Silt	SM/ML	medium dense
Sand to Silty Sand	SP/SM	medium dense
Sand to Silty Sand	" "	medium dense
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	stiff
Silty Clay to Clay	CL	stiff
Silty Clay to Clay	" "	very stiff
Clay	CL/CH	very stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	stiff



END OF SOUNDING AT 25 ft.

Project No.	LANDMARK Geo-Engineers and Geologists	PLATE
LE20178		B-2

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-2

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	49.02	1.41	Silty Sand to Sandy Silt	SM/ML	very dense	115	11	92.7	30	113	44		
0.30	1.0	75.95	1.53	Silty Sand to Sandy Silt	SM/ML	very dense	115	17	143.6	25	110	43		
0.45	1.5	84.66	1.99	Silty Sand to Sandy Silt	SM/ML	very dense	115	19	160.0	30	106	43		
0.60	2.0	63.91	3.64	Clayey Silt to Silty Clay	ML/CL	hard	120	26		45			3.75	>10
0.75	2.5	52.19	6.24	Clay	CL/CH	hard	125	42		65			3.06	>10
0.93	3.0	51.25	5.34	Clay	CL/CH	hard	125	41		60			3.01	>10
1.08	3.5	55.41	2.13	Sandy Silt to Clayey Silt	ML	dense	115	16	104.7	35	78	39		
1.23	4.0	40.17	2.78	Sandy Silt to Clayey Silt	ML	medium dense	115	11	75.9	50	67	37		
1.38	4.5	47.61	0.93	Silty Sand to Sandy Silt	SM/ML	dense	115	11	90.0	25	70	38		
1.53	5.0	49.87	0.79	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	91.7	20	70	38		
1.68	5.5	50.34	0.90	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	88.2	25	69	38		
1.83	6.0	44.12	1.13	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	73.9	30	64	37		
1.98	6.5	52.83	1.16	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	84.9	25	68	37		
2.13	7.0	47.31	0.94	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	73.2	25	63	37		
2.28	7.5	45.37	0.59	Sand to Silty Sand	SP/SM	medium dense	115	8	67.8	20	61	37		
2.45	8.0	53.47	1.13	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	77.3	25	65	37		
2.60	8.5	56.87	1.07	Silty Sand to Sandy Silt	SM/ML	medium dense	115	13	81.1	25	66	37		
2.75	9.0	53.86	1.35	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	75.7	30	64	37		
2.90	9.5	16.78	2.20	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		70			0.96	>10
3.05	10.0	11.20	1.72	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		75			0.63	>10
3.20	10.5	28.07	1.57	Sandy Silt to Clayey Silt	ML	medium dense	115	8	37.8	45	44	34		
3.35	11.0	24.99	2.30	Sandy Silt to Clayey Silt	ML	loose	115	7	33.3	60	40	34		
3.50	11.5	16.81	1.30	Sandy Silt to Clayey Silt	ML	loose	115	5	22.1	60	28	32		
3.65	12.0	10.41	1.47	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		80			0.58	>10
3.80	12.5	35.17	0.70	Silty Sand to Sandy Silt	SM/ML	medium dense	115	8	45.1	30	49	35		
3.95	13.0	45.55	0.63	Sand to Silty Sand	SP/SM	medium dense	115	8	57.8	25	56	36		
4.13	13.5	60.05	0.53	Sand to Silty Sand	SP/SM	medium dense	115	11	75.4	20	64	37		
4.28	14.0	64.72	0.58	Sand to Silty Sand	SP/SM	medium dense	115	12	80.3	20	66	37		
4.43	14.5	60.21	0.72	Sand to Silty Sand	SP/SM	medium dense	115	11	73.9	20	64	37		
4.58	15.0	66.64	0.64	Sand to Silty Sand	SP/SM	medium dense	115	12	81.0	20	66	37		
4.73	15.5	48.34	1.36	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	58.2	35	56	36		
4.88	16.0	26.49	2.60	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		70			1.52	>10
5.03	16.5	22.94	2.45	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		70			1.31	>10
5.18	17.0	11.80	1.98	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.65	>10
5.33	17.5	11.77	2.51	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.65	>10
5.48	18.0	14.05	2.49	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		95			0.78	>10
5.65	18.5	17.78	2.72	Clayey Silt to Silty Clay	ML/CL	very stiff	120	7		85			1.00	>10
5.80	19.0	22.67	3.21	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		85			1.29	>10
5.95	19.5	20.24	3.22	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		90			1.15	>10
6.10	20.0	12.35	2.63	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.68	9.19
6.25	20.5	13.20	3.07	Silty Clay to Clay	CL	stiff	125	8		100			0.73	7.00
6.40	21.0	18.51	4.94	Clay	CL/CH	very stiff	125	15		100			1.04	9.39
6.55	21.5	24.90	3.06	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		80			1.42	>10
6.70	22.0	23.06	4.65	Clay	CL/CH	very stiff	125	18		100			1.31	>10
6.85	22.5	18.06	4.46	Clay	CL/CH	very stiff	125	14		100			1.01	8.14
7.00	23.0	18.54	4.57	Clay	CL/CH	very stiff	125	15		100			1.04	8.27
7.18	23.5	22.09	3.58	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		95			1.25	>10
7.33	24.0	16.14	3.36	Silty Clay to Clay	CL	stiff	125	9		100			0.90	8.00
7.48	24.5	19.75	2.42	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		90			1.11	>10
7.63	25.0	12.83	2.12	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.70	7.00

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

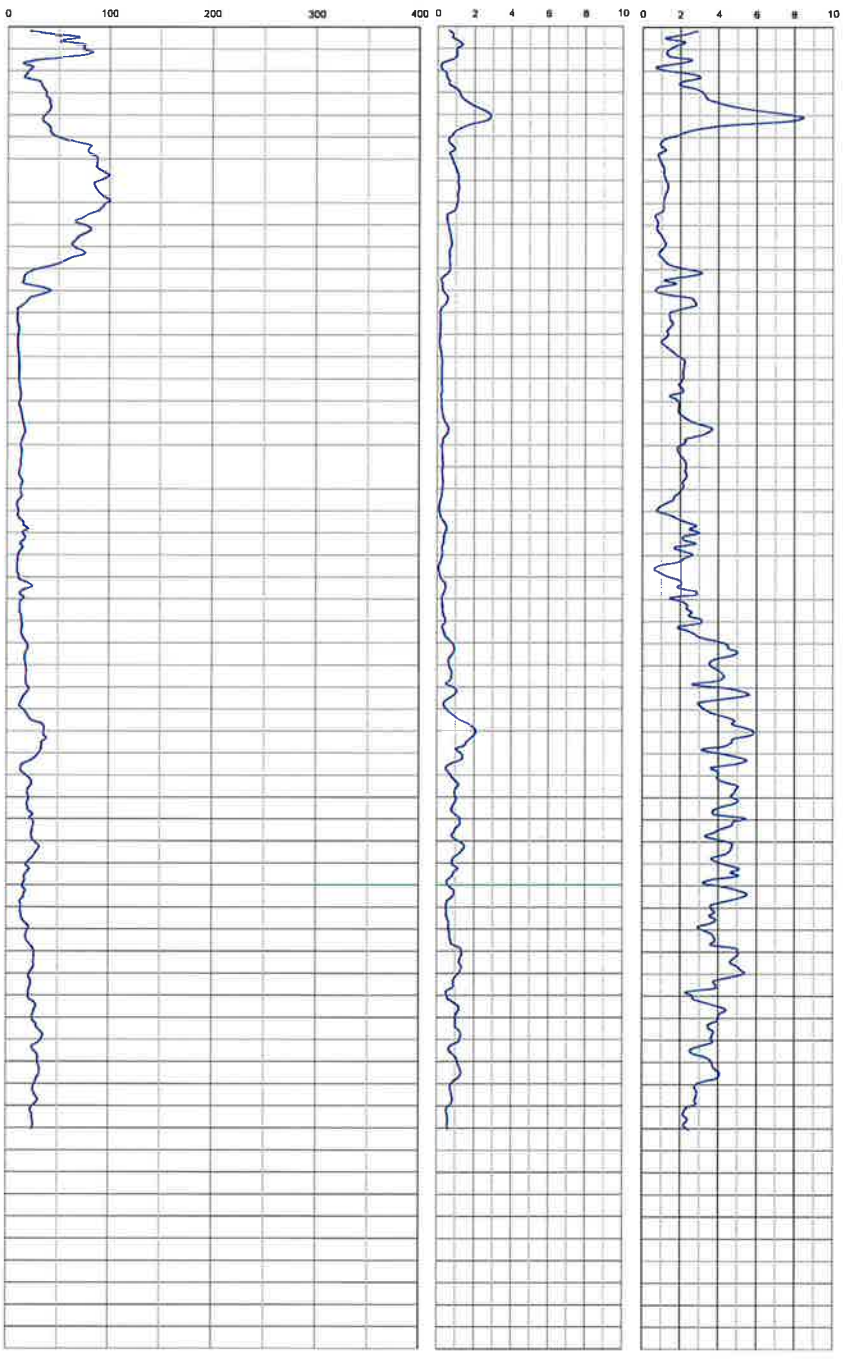
LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

CONE SOUNDING DATA CPT-3

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Silty Sand to Sandy Silt	SM/ML	very dense
	Silty Sand to Sandy Silt	" "	dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Silty Clay to Clay	CL	hard
5	Silty Clay to Clay	" "	hard
	Sand to Silty Sand	SP/SM	dense
	Sand to Silty Sand	" "	dense
	Sand to Silty Sand	" "	dense
	Sand to Silty Sand	" "	dense
10	Sand to Silty Sand	" "	dense
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Sandy Silt to Clayey Silt	ML	loose
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	stiff
15	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
20	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
25	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Silty Clay to Clay	CL	stiff
	Silty Clay to Clay	" "	very stiff
30	Silty Clay to Clay	" "	stiff
	Clay	CL/CH	very stiff
	Silty Clay to Clay	CL	very stiff
	Clay	CL/CH	very stiff
	Clay	" "	very stiff
35	Silty Clay to Clay	CL	very stiff
	Silty Clay to Clay	" "	very stiff
	Silty Clay to Clay	" "	very stiff
	Clay	CL/CH	stiff
	Clay	" "	stiff
40	Silty Clay to Clay	CL	stiff
	Silty Clay to Clay	" "	very stiff
	Clay	CL/CH	very stiff
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
45	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
50	Sandy Silt to Clayey Silt	ML	loose
55			

END OF SOUNDING AT 50 ft.



Project No.	LANDMARK Geo-Engineers and Geologists	PLATE
LE20178		B-3

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-3

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	42.90	2.07	Sandy Silt to Clayey Silt	ML	very dense	115	12	81.1	40	109	43		
0.30	1.0	66.26	1.81	Silty Sand to Sandy Silt	SM/ML	very dense	115	15	125.3	30	106	43		
0.45	1.5	62.66	1.75	Silty Sand to Sandy Silt	SM/ML	very dense	115	14	118.4	30	97	42		
0.60	2.0	19.42	1.28	Sandy Silt to Clayey Silt	ML	medium dense	115	6	36.7	50	57	36		
0.75	2.5	21.36	2.61	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		65			1.25	>10
0.93	3.0	34.74	2.63	Sandy Silt to Clayey Silt	ML	medium dense	115	10	65.7	50	68	37		
1.08	3.5	39.37	3.60	Clayey Silt to Silty Clay	ML/CL	hard	120	16		55			2.30	>10
1.23	4.0	39.75	6.10	Clay	CL/CH	hard	125	32		70			2.33	>10
1.38	4.5	35.57	6.97	Clay	CL/CH	hard	125	28		80			2.08	>10
1.53	5.0	42.63	2.40	Sandy Silt to Clayey Silt	ML	medium dense	115	12	78.2	45	65	37		
1.68	5.5	69.61	1.06	Sand to Silty Sand	SP/SM	dense	115	13	121.7	20	78	39		
1.83	6.0	84.48	0.88	Sand to Silty Sand	SP/SM	dense	115	15	141.3	15	83	40		
1.98	6.5	89.29	1.08	Sand to Silty Sand	SP/SM	dense	115	16	143.3	20	83	40		
2.13	7.0	93.06	1.20	Sand to Silty Sand	SP/SM	dense	115	17	143.8	20	83	40		
2.28	7.5	87.87	1.28	Sand to Silty Sand	SP/SM	dense	115	16	131.1	20	80	39		
2.45	8.0	96.64	1.11	Sand to Silty Sand	SP/SM	dense	115	18	139.6	15	82	40		
2.60	8.5	86.26	0.93	Sand to Silty Sand	SP/SM	dense	115	16	122.8	15	79	39		
2.75	9.0	71.45	0.77	Sand to Silty Sand	SP/SM	dense	115	13	100.3	15	73	38		
2.90	9.5	75.52	0.89	Sand to Silty Sand	SP/SM	dense	115	14	104.6	15	74	38		
3.05	10.0	64.69	1.15	Silty Sand to Sandy Silt	SM/ML	medium dense	115	14	88.4	25	69	38		
3.20	10.5	69.30	0.94	Sand to Silty Sand	SP/SM	dense	115	13	93.5	20	71	38		
3.35	11.0	42.35	1.67	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	56.5	40	56	36		
3.50	11.5	17.02	2.20	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		70			0.97	>10
3.65	12.0	29.40	1.08	Silty Sand to Sandy Silt	SM/ML	medium dense	115	7	38.2	40	44	34		
3.80	12.5	24.48	2.19	Sandy Silt to Clayey Silt	ML	loose	115	7	31.5	60	38	33		
3.95	13.0	11.17	2.11	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		90			0.62	>10
4.13	13.5	9.34	1.49	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		90			0.51	8.85
4.28	14.0	10.38	1.36	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		85			0.57	>10
4.43	14.5	9.62	1.11	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		85			0.53	8.56
4.58	15.0	10.38	1.62	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		90			0.57	9.59
4.73	15.5	10.98	2.19	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		95			0.61	>10
4.88	16.0	10.90	2.12	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		95			0.60	9.79
5.03	16.5	11.86	2.04	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.66	>10
5.18	17.0	12.08	1.71	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.67	>10
5.33	17.5	12.53	1.92	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.69	>10
5.48	18.0	14.65	2.59	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		95			0.82	>10
5.65	18.5	16.32	3.40	Silty Clay to Clay	CL	stiff	125	9		95			0.92	>10
5.80	19.0	13.35	2.15	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.74	>10
5.95	19.5	13.59	1.95	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.75	>10
6.10	20.0	12.68	2.27	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.70	9.59
6.25	20.5	11.87	2.28	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.65	8.00
6.40	21.0	13.50	2.11	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.75	>10
6.55	21.5	12.50	1.72	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.69	8.27
6.70	22.0	9.98	0.93	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		95			0.54	5.42
6.85	22.5	12.14	1.83	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.66	7.41
7.00	23.0	16.84	2.77	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		95			0.94	>10
7.18	23.5	15.26	2.38	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.85	>10
7.33	24.0	12.68	2.14	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.69	7.27
7.48	24.5	9.71	1.67	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.52	4.57
7.63	25.0	10.04	0.95	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.54	4.68
7.78	25.5	18.69	1.93	Sandy Silt to Clayey Silt	ML	loose	115	5	18.7	85	23	31		
7.93	26.0	14.40	2.36	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.79	8.27
8.08	26.5	12.31	2.34	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.67	6.10
8.23	27.0	13.86	2.87	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.76	7.27
8.38	27.5	14.12	2.32	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.77	7.27
8.53	28.0	17.42	3.80	Silty Clay to Clay	CL	stiff	125	10		100			0.96	7.41
8.68	28.5	18.42	4.74	Clay	CL/CH	very stiff	125	15		100			1.02	6.10
8.85	29.0	17.36	3.66	Silty Clay to Clay	CL	stiff	125	10		100			0.96	7.00
9.00	29.5	18.42	4.15	Silty Clay to Clay	CL	very stiff	125	11		100			1.02	7.56
9.15	30.0	19.27	3.62	Silty Clay to Clay	CL	very stiff	125	11		100			1.07	8.00
9.30	30.5	17.02	5.05	Clay	CL/CH	stiff	125	14		100			0.94	4.89
9.45	31.0	13.50	3.12	Silty Clay to Clay	CL	stiff	125	8		100			0.73	4.18
9.60	31.5	21.00	4.32	Silty Clay to Clay	CL	very stiff	125	12		100			1.17	8.70
9.75	32.0	35.28	5.32	Clay	CL/CH	hard	125	28		100			2.01	>10
9.90	32.5	35.86	5.06	Clay	CL/CH	hard	125	29		95			2.04	>10
10.05	33.0	32.62	3.83	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		90			1.85	>10
10.20	33.5	22.39	5.11	Clay	CL/CH	very stiff	125	18		100			1.25	6.65
10.38	34.0	14.87	3.86	Silty Clay to Clay	CL	stiff	125	8		100			0.80	4.28
10.53	34.5	22.85	4.42	Silty Clay to Clay	CL	very stiff	125	13		100			1.27	8.70
10.68	35.0	20.27	4.80	Clay	CL/CH	very stiff	125	16		100			1.12	5.31
10.83	35.5	20.09	4.63	Clay	CL/CH	very stiff	125	16		100			1.11	5.10
10.98	36.0	22.88	4.29	Silty Clay to Clay	CL	very stiff	125	13		100			1.27	8.14
11.13	36.5	25.06	4.33	Silty Clay to Clay	CL	very stiff	125	14		100			1.40	9.59
11.28	37.0	25.82	4.02	Silty Clay to Clay	CL	very stiff	125	15		100			1.44	>10
11.43	37.5	29.43	4.54	Silty Clay to Clay	CL	very stiff	125	17		100			1.65	>10
11.58	38.0	21.48	4.01	Silty Clay to Clay	CL	very stiff	125	12		100			1.19	6.65
11.73	38.5	19.48	4.93	Clay	CL/CH	very stiff	125	16		100			1.07	4.37

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-3 Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Est. GWT (ft): 8

Base Depth (m)	Base Depth (ft)	Avg Tip Qc_1 tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
11.88	39.0	16.31	3.71	Silty Clay to Clay	CL	stiff	125	9		100			0.88	4.09
12.05	39.5	16.90	5.22	Clay	CL/CH	stiff	125	14		100			0.91	3.43
12.20	40.0	13.29	3.88	Clay	CL/CH	stiff	125	11		100			0.70	2.34
12.35	40.5	14.20	3.73	Silty Clay to Clay	CL	stiff	125	8		100			0.75	3.21
12.50	41.0	19.84	3.25	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.08	7.13
12.65	41.5	18.93	3.75	Silty Clay to Clay	CL	very stiff	125	11		100			1.03	4.78
12.80	42.0	24.85	4.52	Silty Clay to Clay	CL	very stiff	125	14		100			1.38	7.41
12.95	42.5	26.24	4.79	Clay	CL/CH	very stiff	125	21		100			1.46	6.10
13.10	43.0	24.39	5.18	Clay	CL/CH	very stiff	125	20		100			1.35	5.31
13.25	43.5	22.75	4.07	Silty Clay to Clay	CL	very stiff	125	13		100			1.25	6.10
13.40	44.0	21.57	2.94	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.18	7.41
13.58	44.5	25.79	3.33	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		100			1.43	>10
13.73	45.0	26.00	4.16	Silty Clay to Clay	CL	very stiff	125	15		100			1.44	7.13
13.88	45.5	27.94	3.65	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.55	>10
14.03	46.0	34.25	3.68	Clayey Silt to Silty Clay	ML/CL	very stiff	120	14		100			1.92	>10
14.18	46.5	27.49	3.08	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.52	>10
14.33	47.0	30.17	3.31	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		100			1.68	>10
14.48	47.5	32.13	3.94	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		100			1.79	>10
14.63	48.0	28.07	3.23	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.55	>10
14.78	48.5	27.27	2.85	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.51	>10
14.93	49.0	27.58	2.66	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		100			1.52	>10
15.10	49.5	24.60	2.26	Sandy Silt to Clayey Silt	ML	loose	115	7	18.5	100	23	31		
15.25	50.0	25.55	2.32	Sandy Silt to Clayey Silt	ML	loose	115	7	19.1	100	24	31		

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

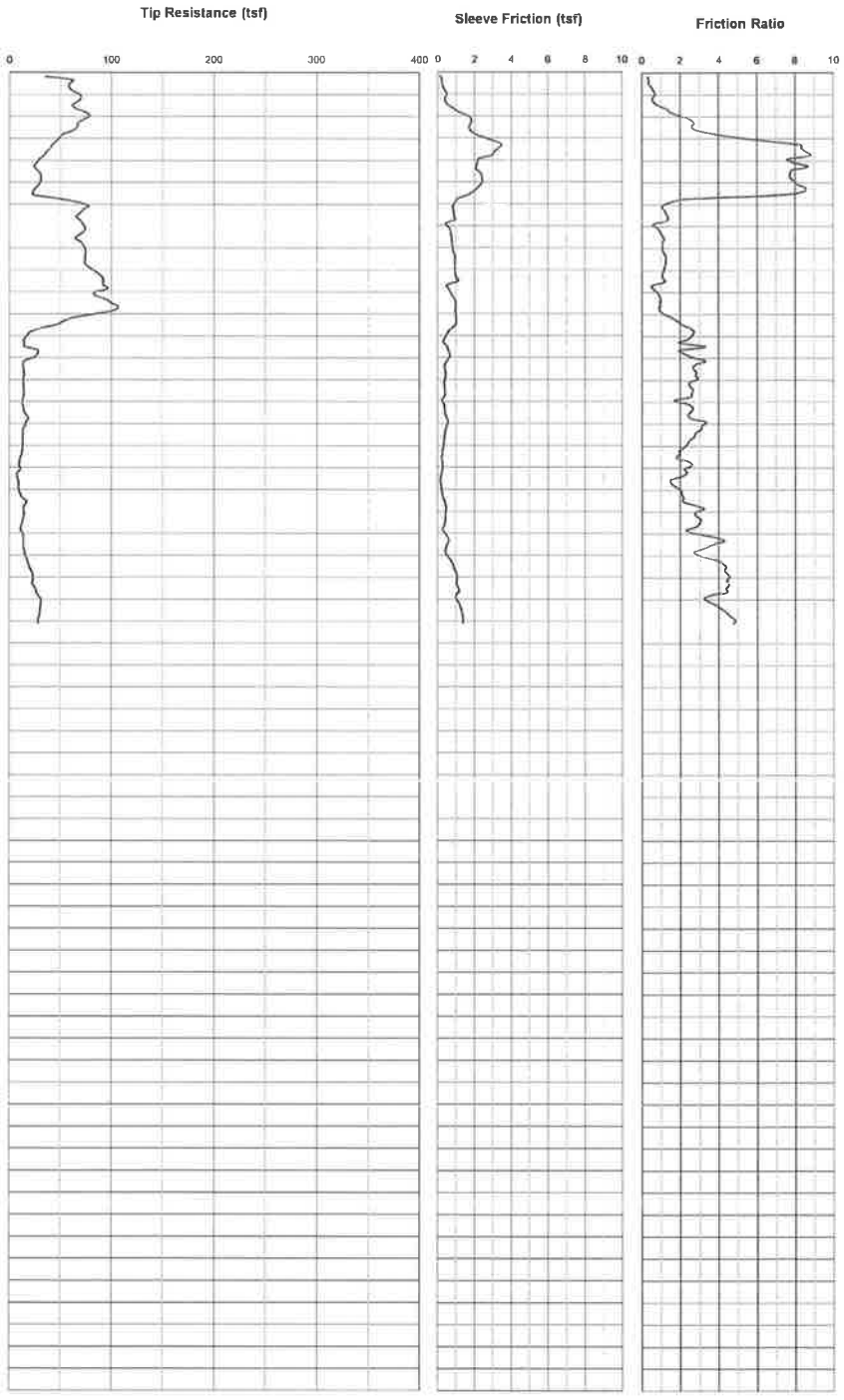
CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

CONE SOUNDING DATA CPT-4

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand to Silty Sand	SP/SM	very dense
	Sand to Silty Sand	" "	very dense
	Sandy Silt to Clayey Silt	ML	dense
	Clay	CL/CH	hard
5	Clay	" "	very stiff
	Clay	" "	hard
	Sand to Silty Sand	SP/SM	dense
	Sand to Silty Sand	" "	dense
	Sand to Silty Sand	" "	dense
	Sand to Silty Sand	" "	dense
10	Sand to Silty Sand	" "	dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
15	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	firm
	Clayey Silt to Silty Clay	" "	stiff
20	Clayey Silt to Silty Clay	" "	stiff
	Silty Clay to Clay	CL	stiff
	Silty Clay to Clay	" "	very stiff
	Silty Clay to Clay	" "	very stiff
	Silty Clay to Clay	" "	very stiff
25			
30			
35			
40			
45			
50			
55			



END OF SOUNDING AT 25 ft.

Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-4

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-4

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	51.72	0.31	Sand to Silty Sand	SP/SM	very dense	115	9	97.8	10	115	44		
0.30	1.0	62.83	0.58	Sand to Silty Sand	SP/SM	very dense	115	11	118.8	15	104	43		
0.45	1.5	65.98	0.65	Sand to Silty Sand	SP/SM	very dense	115	12	124.7	15	98	42		
0.60	2.0	72.94	1.61	Silty Sand to Sandy Silt	SM/ML	very dense	115	16	137.9	25	96	41		
0.75	2.5	68.57	2.56	Sandy Silt to Clayey Silt	ML	very dense	115	20	129.6	35	91	41		
0.93	3.0	54.54	3.85	Clayey Silt to Silty Clay	ML/CL	hard	120	22		50			3.20	>10
1.08	3.5	42.40	7.72	Clay	CL/CH	hard	125	34		80			2.48	>10
1.23	4.0	32.69	8.29	Clay	CL/CH	very stiff	125	26		85			1.91	>10
1.38	4.5	25.71	8.16	Clay	CL/CH	very stiff	125	21		95			1.50	>10
1.53	5.0	30.35	7.76	Clay	CL/CH	very stiff	125	24		85			1.77	>10
1.68	5.5	24.99	8.01	Clay	CL/CH	very stiff	125	20		95			1.45	>10
1.83	6.0	64.56	1.54	Silty Sand to Sandy Silt	SM/ML	dense	115	14	107.0	30	74	38		
1.98	6.5	68.93	1.23	Silty Sand to Sandy Silt	SM/ML	dense	115	15	109.7	25	75	39		
2.13	7.0	71.78	0.88	Sand to Silty Sand	SP/SM	dense	115	13	110.1	20	75	39		
2.28	7.5	68.43	1.03	Sand to Silty Sand	SP/SM	dense	115	12	101.4	20	73	38		
2.45	8.0	72.12	1.06	Sand to Silty Sand	SP/SM	dense	115	13	103.4	20	73	38		
2.60	8.5	74.18	1.20	Sand to Silty Sand	SP/SM	dense	115	13	104.9	20	74	38		
2.75	9.0	78.16	1.16	Sand to Silty Sand	SP/SM	dense	115	14	109.0	20	75	39		
2.90	9.5	90.54	1.10	Sand to Silty Sand	SP/SM	dense	115	16	124.6	20	79	39		
3.05	10.0	90.39	0.63	Sand to Silty Sand	SP/SM	dense	115	16	122.8	10	79	39		
3.20	10.5	93.39	0.93	Sand to Silty Sand	SP/SM	dense	115	17	125.3	15	79	39		
3.35	11.0	97.55	0.98	Sand to Silty Sand	SP/SM	dense	115	18	129.3	15	80	39		
3.50	11.5	53.48	1.84	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	70.0	35	62	37		
3.65	12.0	22.40	2.60	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		65			1.28	>10
3.80	12.5	14.43	2.53	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.81	>10
3.95	13.0	26.26	2.26	Sandy Silt to Clayey Silt	ML	loose	115	8	33.1	60	40	34		
4.13	13.5	13.78	2.90	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		90			0.77	>10
4.28	14.0	13.90	2.83	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		90			0.78	>10
4.43	14.5	13.51	2.53	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.76	>10
4.58	15.0	13.48	2.25	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		85			0.75	>10
4.73	15.5	13.36	2.53	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.75	>10
4.88	16.0	16.37	2.84	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		90			0.92	>10
5.03	16.5	12.98	2.85	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.72	>10
5.18	17.0	12.78	2.34	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.71	>10
5.33	17.5	11.29	1.89	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.62	9.00
5.48	18.0	9.86	2.40	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.54	6.76
5.65	18.5	7.68	1.95	Clayey Silt to Silty Clay	ML/CL	firm	120	3		100			0.41	4.28
5.80	19.0	8.71	1.76	Clayey Silt to Silty Clay	ML/CL	firm	120	3		100			0.47	5.10
5.95	19.5	13.11	2.11	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.73	>10
6.10	20.0	14.27	2.88	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.79	>10
6.25	20.5	13.17	2.93	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.73	9.79
6.40	21.0	11.65	2.65	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.64	7.41
6.55	21.5	13.42	3.89	Clay	CL/CH	stiff	125	11		100			0.74	5.10
6.70	22.0	14.48	2.92	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.80	>10
6.85	22.5	17.82	4.05	Silty Clay to Clay	CL	stiff	125	10		100			1.00	>10
7.00	23.0	21.73	4.43	Silty Clay to Clay	CL	very stiff	125	12		100			1.23	>10
7.18	23.5	23.19	4.43	Silty Clay to Clay	CL	very stiff	125	13		100			1.31	>10
7.33	24.0	27.74	3.75	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		90			1.58	>10
7.48	24.5	30.29	3.85	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		85			1.73	>10
7.63	25.0	28.74	4.63	Silty Clay to Clay	CL	very stiff	125	16		95			1.64	>10

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

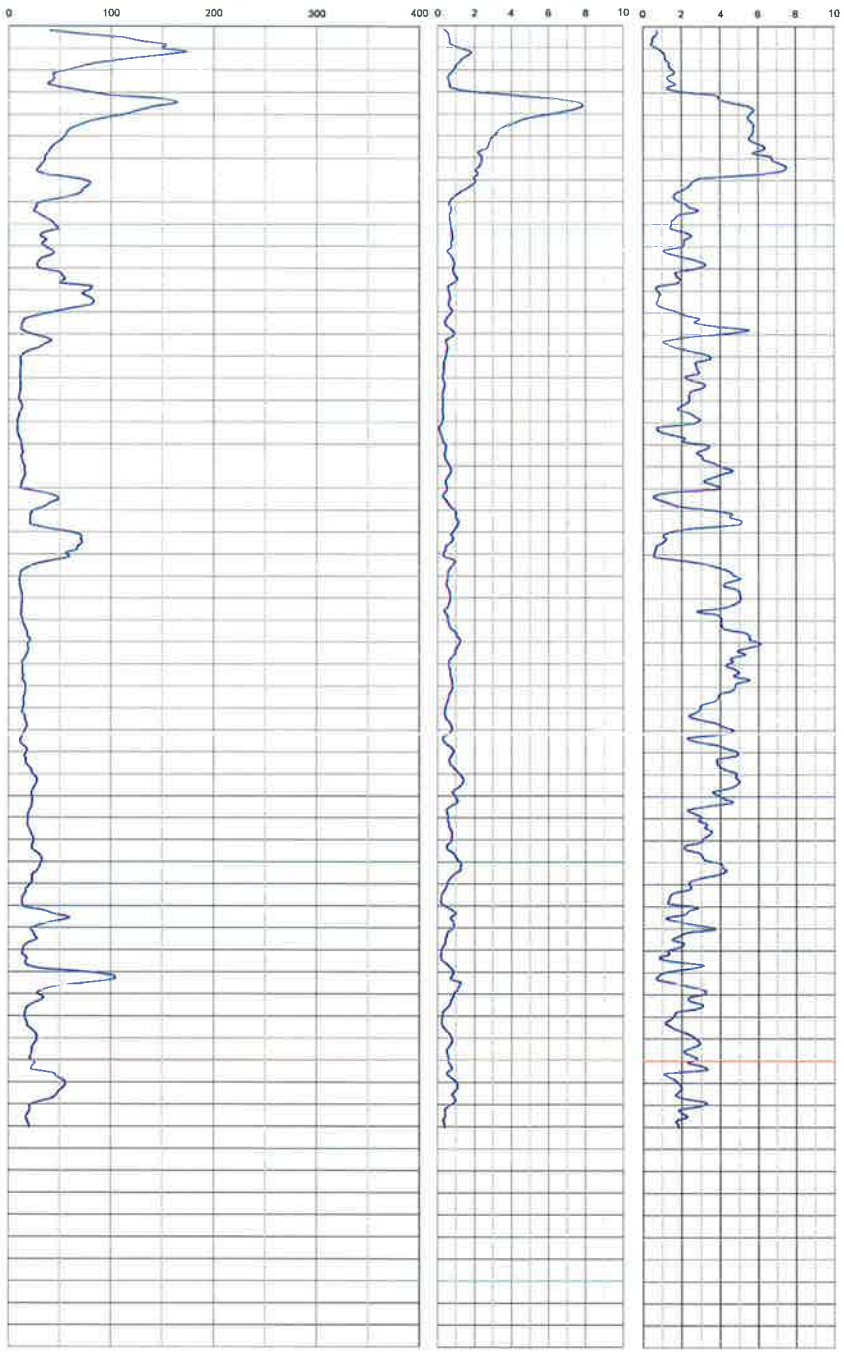
CONE SOUNDING DATA CPT-5

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

DEPTH			
	Sand	SP	very dense
	Sand to Silty Sand	SP/SM	very dense
	Silty Sand to Sandy Silt	SM/ML	dense
	Overconsolidated Soil	??	very dense
	Overconsolidated Soil	" "	dense
5	Clay	CL/CH	hard
	Clay	" "	hard
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Sandy Silt to Clayey Silt	" "	medium dense
10	Sandy Silt to Clayey Silt	" "	medium dense
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Sand to Silty Sand	SP/SM	medium dense
	Silty Clay to Clay	CL	stiff
	Sandy Silt to Clayey Silt	ML	medium dense
15	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Silty Clay to Clay	CL	stiff
20	Silty Clay to Clay	" "	stiff
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sand to Silty Sand	SP/SM	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
25	Clay	CL/CH	stiff
	Clay	" "	stiff
	Clay	" "	very stiff
	Clay	" "	stiff
	Clay	" "	stiff
30	Silty Clay to Clay	CL	stiff
	Silty Clay to Clay	" "	stiff
	Silty Clay to Clay	" "	stiff
	Silty Clay to Clay	" "	very stiff
	Silty Clay to Clay	" "	very stiff
35	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	stiff
40	Sandy Silt to Clayey Silt	ML	loose
	Sandy Silt to Clayey Silt	" "	loose
	Sandy Silt to Clayey Silt	" "	loose
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Sandy Silt to Clayey Silt	ML	loose
45	Sandy Silt to Clayey Silt	" "	loose
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sandy Silt to Clayey Silt	ML	loose
	Sandy Silt to Clayey Silt	" "	loose
50	Sandy Silt to Clayey Silt	" "	very loose
55			

END OF SOUNDING AT 50 ft.



Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-5

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-5 | Est. GWT (ft): 8 | Phi Correlation: 0 | 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	73.74	0.64	Sand to Silty Sand	SP/SM	very dense	115	13	139.4	15	125	46		
0.30	1.0	143.78	0.55	Sand	SP	very dense	110	22	271.8	5	129	46		
0.45	1.5	145.32	1.10	Sand to Silty Sand	SP/SM	very dense	115	26	274.7	10	122	45		
0.60	2.0	72.07	1.41	Silty Sand to Sandy Silt	SM/ML	very dense	115	16	136.2	25	96	41		
0.75	2.5	43.51	1.40	Silty Sand to Sandy Silt	SM/ML	dense	115	10	82.3	35	77	39		
0.93	3.0	57.72	1.62	Silty Sand to Sandy Silt	SM/ML	dense	115	13	109.1	30	83	40		
1.08	3.5	138.17	4.08	Overconsolidated Soil	??	very dense	120	138	261.2	35	106	43		
1.23	4.0	129.97	5.60	Overconsolidated Soil	??	very dense	120	130	245.7	45	102	42		
1.38	4.5	83.85	5.58	Overconsolidated Soil	??	dense	120	84	158.5	55	87	40		
1.53	5.0	58.41	5.70	Clay	CL/CH	hard	125	47		60			3.42	>10
1.68	5.5	45.95	5.96	Clay	CL/CH	hard	125	37		65			2.68	>10
1.83	6.0	36.16	6.36	Clay	CL/CH	hard	125	29		75			2.11	>10
1.98	6.5	29.92	7.32	Clay	CL/CH	very stiff	125	24		85			1.74	>10
2.13	7.0	60.96	3.75	Clayey Silt to Silty Clay	ML/CL	hard	120	24		50			3.56	>10
2.28	7.5	73.43	2.09	Silty Sand to Sandy Silt	SM/ML	dense	115	16	108.8	30	75	38		
2.45	8.0	43.18	1.83	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	61.9	40	58	36		
2.60	8.5	27.40	2.39	Sandy Silt to Clayey Silt	ML	medium dense	115	8	38.8	55	44	34		
2.75	9.0	41.12	1.54	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	57.4	35	56	36		
2.90	9.5	38.10	2.04	Sandy Silt to Clayey Silt	ML	medium dense	115	11	52.4	45	53	35		
3.05	10.0	35.15	2.10	Sandy Silt to Clayey Silt	ML	medium dense	115	10	47.8	45	51	35		
3.20	10.5	39.79	1.57	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	53.4	40	54	36		
3.35	11.0	29.19	2.94	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		60			1.69	>10
3.50	11.5	52.17	1.78	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	68.2	35	61	37		
3.65	12.0	70.13	1.07	Sand to Silty Sand	SP/SM	medium dense	115	13	90.6	25	70	38		
3.80	12.5	78.10	0.82	Sand to Silty Sand	SP/SM	dense	115	14	99.8	20	72	38		
3.95	13.0	62.56	1.16	Silty Sand to Sandy Silt	SM/ML	medium dense	115	14	79.0	25	66	37		
4.13	13.5	19.41	2.60	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		75			1.11	>10
4.28	14.0	15.14	4.50	Clay	CL/CH	stiff	125	12		100			0.85	>10
4.43	14.5	36.52	1.57	Silty Sand to Sandy Silt	SM/ML	medium dense	115	8	44.5	45	49	35		
4.58	15.0	20.14	2.58	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		75			1.15	>10
4.73	15.5	11.72	2.99	Silty Clay to Clay	CL	stiff	125	7		100			0.65	7.85
4.88	16.0	11.24	2.60	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.62	>10
5.03	16.5	11.48	2.91	Silty Clay to Clay	CL	stiff	125	7		100			0.63	7.00
5.18	17.0	10.57	2.38	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.58	8.14
5.33	17.5	12.20	2.07	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.68	>10
5.48	18.0	9.17	2.70	Silty Clay to Clay	CL	firm	125	5		100			0.50	4.37
5.65	18.5	8.81	0.98	Clayey Silt to Silty Clay	ML/CL	firm	120	4		95			0.47	5.42
5.80	19.0	11.72	2.54	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.64	8.56
5.95	19.5	13.26	3.01	Silty Clay to Clay	CL	stiff	125	8		100			0.73	7.27
6.10	20.0	14.38	3.61	Silty Clay to Clay	CL	stiff	125	8		100			0.80	8.14
6.25	20.5	15.53	4.10	Clay	CL/CH	stiff	125	12		100			0.87	6.76
6.40	21.0	12.66	3.60	Silty Clay to Clay	CL	stiff	125	7		100			0.70	6.10
6.55	21.5	41.73	0.92	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	44.1	40	48	35		
6.70	22.0	33.43	2.25	Sandy Silt to Clayey Silt	ML	medium dense	115	10	35.1	65	42	34		
6.85	22.5	21.35	4.74	Clay	CL/CH	very stiff	125	17		100			1.20	>10
7.00	23.0	39.67	2.99	Sandy Silt to Clayey Silt	ML	medium dense	115	11	41.0	70	46	34		
7.18	23.5	71.04	1.07	Sand to Silty Sand	SP/SM	medium dense	115	13	72.8	30	63	37		
7.33	24.0	63.41	0.62	Sand to Silty Sand	SP/SM	medium dense	115	12	64.5	25	60	36		
7.48	24.5	42.46	1.99	Sandy Silt to Clayey Silt	ML	medium dense	115	12	42.9	55	47	35		
7.63	25.0	14.05	4.39	Clay	CL/CH	stiff	125	11		100			0.77	4.57
7.78	25.5	10.87	4.53	Clay	CL/CH	stiff	125	9		100			0.58	3.07
7.93	26.0	12.60	4.99	Clay	CL/CH	stiff	125	10		100			0.68	3.66
8.08	26.5	12.79	4.18	Clay	CL/CH	stiff	125	10		100			0.69	3.66
8.23	27.0	13.14	3.98	Clay	CL/CH	stiff	125	11		100			0.71	3.74
8.38	27.5	16.80	4.54	Clay	CL/CH	stiff	125	13		100			0.93	5.42
8.53	28.0	19.47	5.74	Clay	CL/CH	very stiff	125	16		100			1.08	6.65
8.68	28.5	18.53	5.25	Clay	CL/CH	very stiff	125	15		100			1.03	6.00
8.85	29.0	14.29	4.50	Clay	CL/CH	stiff	125	11		100			0.78	3.83
9.00	29.5	13.99	4.81	Clay	CL/CH	stiff	125	11		100			0.76	3.66
9.15	30.0	15.35	5.06	Clay	CL/CH	stiff	125	12		100			0.84	4.09
9.30	30.5	15.66	4.15	Clay	CL/CH	stiff	125	13		100			0.86	4.18
9.45	31.0	14.39	3.19	Silty Clay to Clay	CL	stiff	125	8		100			0.78	4.57
9.60	31.5	15.11	2.66	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.82	6.54
9.75	32.0	17.08	4.20	Clay	CL/CH	stiff	125	14		100			0.94	4.47
9.90	32.5	12.57	3.07	Silty Clay to Clay	CL	stiff	125	7		100			0.67	3.50
10.05	33.0	16.02	4.30	Clay	CL/CH	stiff	125	13		100			0.87	3.91
10.20	33.5	16.51	4.17	Clay	CL/CH	stiff	125	13		100			0.90	4.00
10.38	34.0	21.59	4.37	Silty Clay to Clay	CL	very stiff	125	12		100			1.20	7.85
10.53	34.5	27.22	4.90	Clay	CL/CH	very stiff	125	22		100			1.53	8.85
10.68	35.0	23.26	3.99	Silty Clay to Clay	CL	very stiff	125	13		100			1.29	8.70
10.83	35.5	23.07	4.07	Silty Clay to Clay	CL	very stiff	125	13		100			1.28	8.27
10.98	36.0	19.68	2.64	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.08	8.56
11.13	36.5	19.49	3.22	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.07	8.27
11.28	37.0	23.65	3.15	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.31	>10
11.43	37.5	24.83	2.43	Sandy Silt to Clayey Silt	ML	loose	115	7	21.0	95	26	32		
11.58	38.0	31.85	3.44	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		95			1.79	>10
11.73	38.5	26.86	4.08	Silty Clay to Clay	CL	very stiff	125	15		100			1.50	>10

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-5

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
11.88	39.0	22.12	2.61	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.22	9.59
12.05	39.5	16.05	1.81	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.86	5.31
12.20	40.0	14.31	1.81	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.76	4.28
12.35	40.5	46.48	1.90	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	38.0	65	44	34		
12.50	41.0	32.49	2.82	Sandy Silt to Clayey Silt	ML	loose	115	9	26.5	90	33	33		
12.65	41.5	25.86	1.89	Sandy Silt to Clayey Silt	ML	loose	115	7	21.0	90	26	32		
12.80	42.0	16.23	1.78	Sandy Silt to Clayey Silt	ML	very loose	115	5	13.1	100	12	30		
12.95	42.5	15.99	1.24	Sandy Silt to Clayey Silt	ML	very loose	115	5	12.8	100	12	30		
13.10	43.0	40.97	2.20	Sandy Silt to Clayey Silt	ML	loose	115	12	32.8	75	40	34		
13.25	43.5	94.23	1.02	Sand to Silty Sand	SP/SM	medium dense	115	17	75.0	35	64	37		
13.40	44.0	36.13	2.92	Sandy Silt to Clayey Silt	ML	loose	115	10	28.6	90	36	33		
13.58	44.5	28.74	2.63	Sandy Silt to Clayey Silt	ML	loose	115	8	22.7	95	29	32		
13.73	45.0	16.62	2.07	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		100			0.89	4.78
13.88	45.5	17.68	1.32	Sandy Silt to Clayey Silt	ML	very loose	115	5	13.8	100	14	30		
14.03	46.0	26.01	2.24	Sandy Silt to Clayey Silt	ML	loose	115	7	20.3	100	25	32		
14.18	46.5	25.07	2.74	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		100			1.38	9.39
14.33	47.0	22.87	2.42	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.25	7.70
14.48	47.5	30.19	2.48	Sandy Silt to Clayey Silt	ML	loose	115	9	23.2	95	29	32		
14.63	48.0	52.69	1.65	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	40.3	65	46	34		
14.78	48.5	49.82	1.86	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	38.0	70	44	34		
14.93	49.0	30.43	2.81	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		100			1.69	>10
15.10	49.5	19.14	2.07	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.03	5.31
15.25	50.0	19.23	1.80	Sandy Silt to Clayey Silt	ML	very loose	115	5	14.5	100	15	30		

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

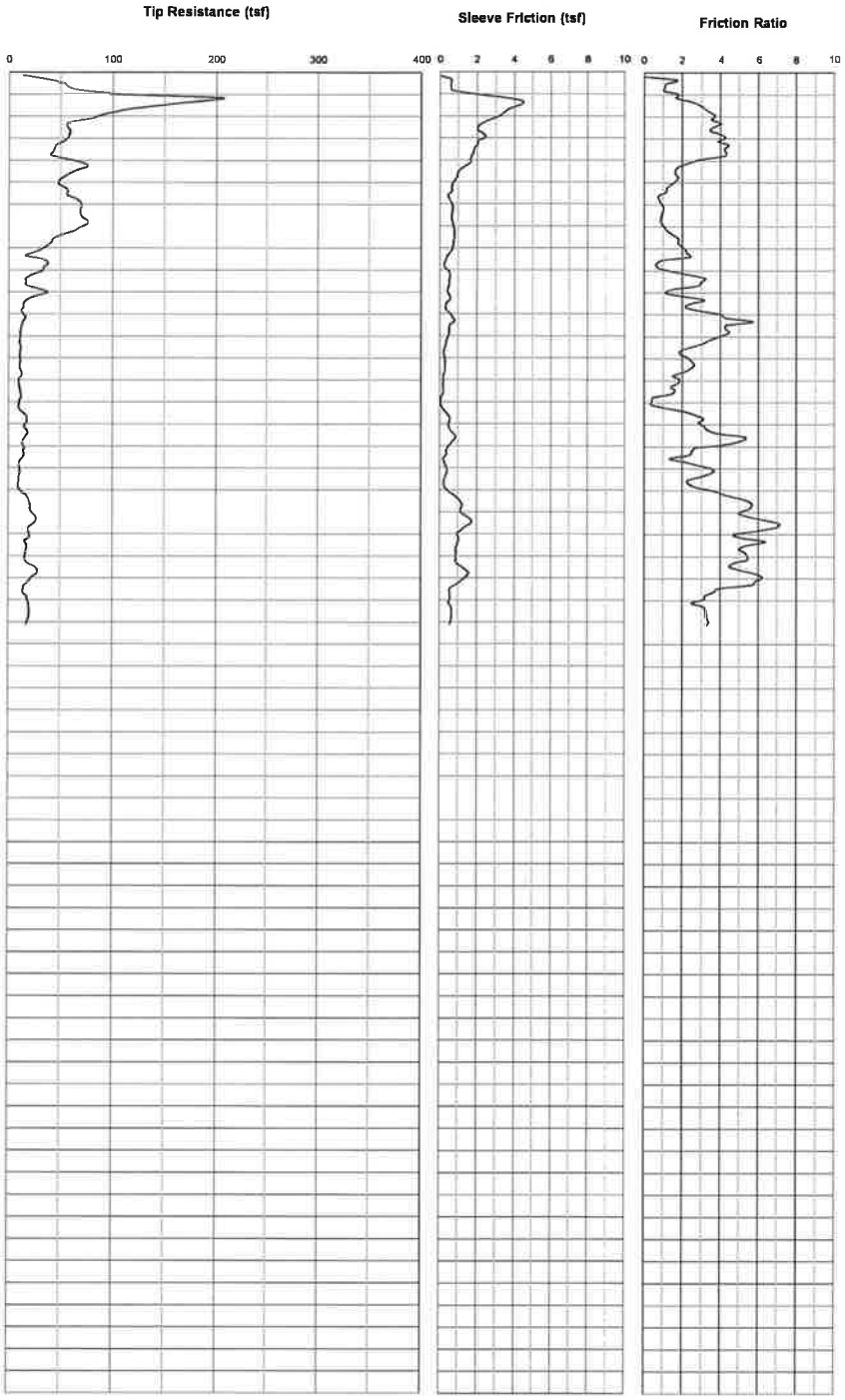
CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

CONE SOUNDING DATA CPT-6

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Silty Sand to Sandy Silt	SM/ML	very dense
	Silty Sand to Sandy Silt	" "	very dense
	Clayey Silt to Silty Clay	ML/CL	hard
	Clayey Silt to Silty Clay	" "	hard
5	Silty Sand to Sandy Silt	SM/ML	dense
	Silty Sand to Sandy Silt	" "	dense
	Sand to Silty Sand	SP/SM	dense
	Silty Sand to Sandy Silt	SM/ML	medium dense
	Silty Sand to Sandy Silt	" "	medium dense
10	Sandy Silt to Clayey Silt	ML	loose
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clay	CL/CH	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
15	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Silty Clay to Clay	CL	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Silty Clay to Clay	CL	stiff
20	Clay	CL/CH	very stiff
	Clay	" "	very stiff
	Clay	" "	stiff
	Clay	" "	very stiff
	Clay	" "	stiff
25	Clayey Silt to Silty Clay	ML/CL	very stiff



END OF SOUNDING AT 25 ft.

Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-6

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-6

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	33.51	0.96	Silty Sand to Sandy Silt	SM/ML	very dense	115	7	63.3	30	102	42		
0.30	1.0	73.22	1.31	Silty Sand to Sandy Silt	SM/ML	very dense	115	16	138.4	25	109	43		
0.45	1.5	178.02	2.35	Silty Sand to Sandy Silt	SM/ML	very dense	115	40	336.5	20	128	46		
0.60	2.0	101.99	3.45	Sandy Silt to Clayey Silt	ML	very dense	115	29	192.8	35	106	43		
0.75	2.5	63.72	3.74	Clayey Silt to Silty Clay	ML/CL	hard	120	25		45			3.74	>10
0.93	3.0	58.22	3.89	Clayey Silt to Silty Clay	ML/CL	hard	120	23		50			3.42	>10
1.08	3.5	47.64	4.17	Clayey Silt to Silty Clay	ML/CL	hard	120	19		55			2.79	>10
1.23	4.0	46.33	3.82	Clayey Silt to Silty Clay	ML/CL	hard	120	19		55			2.71	>10
1.38	4.5	70.86	1.93	Silty Sand to Sandy Silt	SM/ML	dense	115	16	134.0	30	82	39		
1.53	5.0	52.99	1.69	Silty Sand to Sandy Silt	SM/ML	dense	115	12	97.7	35	72	38		
1.68	5.5	53.92	1.13	Silty Sand to Sandy Silt	SM/ML	dense	115	12	94.6	25	71	38		
1.83	6.0	67.75	0.88	Sand to Silty Sand	SP/SM	dense	115	12	113.7	20	76	39		
1.98	6.5	69.32	0.94	Sand to Silty Sand	SP/SM	dense	115	13	111.7	20	76	39		
2.13	7.0	72.77	0.97	Sand to Silty Sand	SP/SM	dense	115	13	112.8	20	76	39		
2.28	7.5	51.96	1.53	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	77.8	30	65	37		
2.45	8.0	36.35	1.96	Sandy Silt to Clayey Silt	ML	medium dense	115	10	52.6	45	54	35		
2.60	8.5	24.95	1.85	Sandy Silt to Clayey Silt	ML	medium dense	115	7	35.6	50	42	34		
2.75	9.0	34.57	0.91	Silty Sand to Sandy Silt	SM/ML	medium dense	115	8	48.7	30	51	35		
2.90	9.5	18.84	2.84	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		70			1.08	>10
3.05	10.0	27.79	1.83	Sandy Silt to Clayey Silt	ML	medium dense	115	8	38.0	50	44	34		
3.20	10.5	19.30	2.54	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		70			1.10	>10
3.35	11.0	13.70	3.04	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		85			0.77	>10
3.50	11.5	14.33	4.76	Clay	CL/CH	stiff	125	11		100			0.81	>10
3.65	12.0	11.48	4.25	Clay	CL/CH	stiff	125	9		100			0.64	7.70
3.80	12.5	11.07	3.01	Silty Clay to Clay	CL	stiff	125	6		100			0.62	9.19
3.95	13.0	11.10	2.04	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		90			0.62	>10
4.13	13.5	11.04	2.50	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		95			0.61	>10
4.28	14.0	11.67	1.81	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		85			0.65	>10
4.43	14.5	10.43	1.60	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		90			0.58	>10
4.58	15.0	11.31	0.78	Sandy Silt to Clayey Silt	ML	very loose	115	3	13.6	70	14	30		
4.73	15.5	10.77	1.25	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		85			0.59	9.79
4.88	16.0	16.63	2.94	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		90			0.94	>10
5.03	16.5	17.06	4.14	Silty Clay to Clay	CL	stiff	125	10		100			0.96	>10
5.18	17.0	14.24	4.05	Clay	CL/CH	stiff	125	11		100			0.80	7.41
5.33	17.5	14.25	2.07	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.80	>10
5.48	18.0	10.56	2.93	Silty Clay to Clay	CL	stiff	125	6		100			0.58	5.53
5.65	18.5	10.43	2.90	Silty Clay to Clay	CL	stiff	125	6		100			0.57	5.21
5.80	19.0	10.07	2.92	Silty Clay to Clay	CL	stiff	125	6		100			0.55	4.78
5.95	19.5	18.69	4.90	Clay	CL/CH	very stiff	125	15		100			1.05	>10
6.10	20.0	21.75	5.36	Clay	CL/CH	very stiff	125	17		100			1.23	>10
6.25	20.5	25.53	6.26	Clay	CL/CH	very stiff	125	20		100			1.45	>10
6.40	21.0	19.63	5.86	Clay	CL/CH	very stiff	125	16		100			1.11	>10
6.55	21.5	17.75	5.64	Clay	CL/CH	stiff	125	14		100			0.99	8.00
6.70	22.0	16.70	5.21	Clay	CL/CH	stiff	125	13		100			0.93	6.88
6.85	22.5	20.48	4.85	Clay	CL/CH	very stiff	125	16		100			1.15	>10
7.00	23.0	25.59	5.73	Clay	CL/CH	very stiff	125	20		100			1.45	>10
7.18	23.5	16.67	5.11	Clay	CL/CH	stiff	125	13		100			0.93	6.32
7.33	24.0	16.58	3.30	Silty Clay to Clay	CL	stiff	125	9		100			0.92	8.14
7.48	24.5	19.69	2.91	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		95			1.10	>10
7.63	25.0	19.48	3.25	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.09	>10

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/17/2020

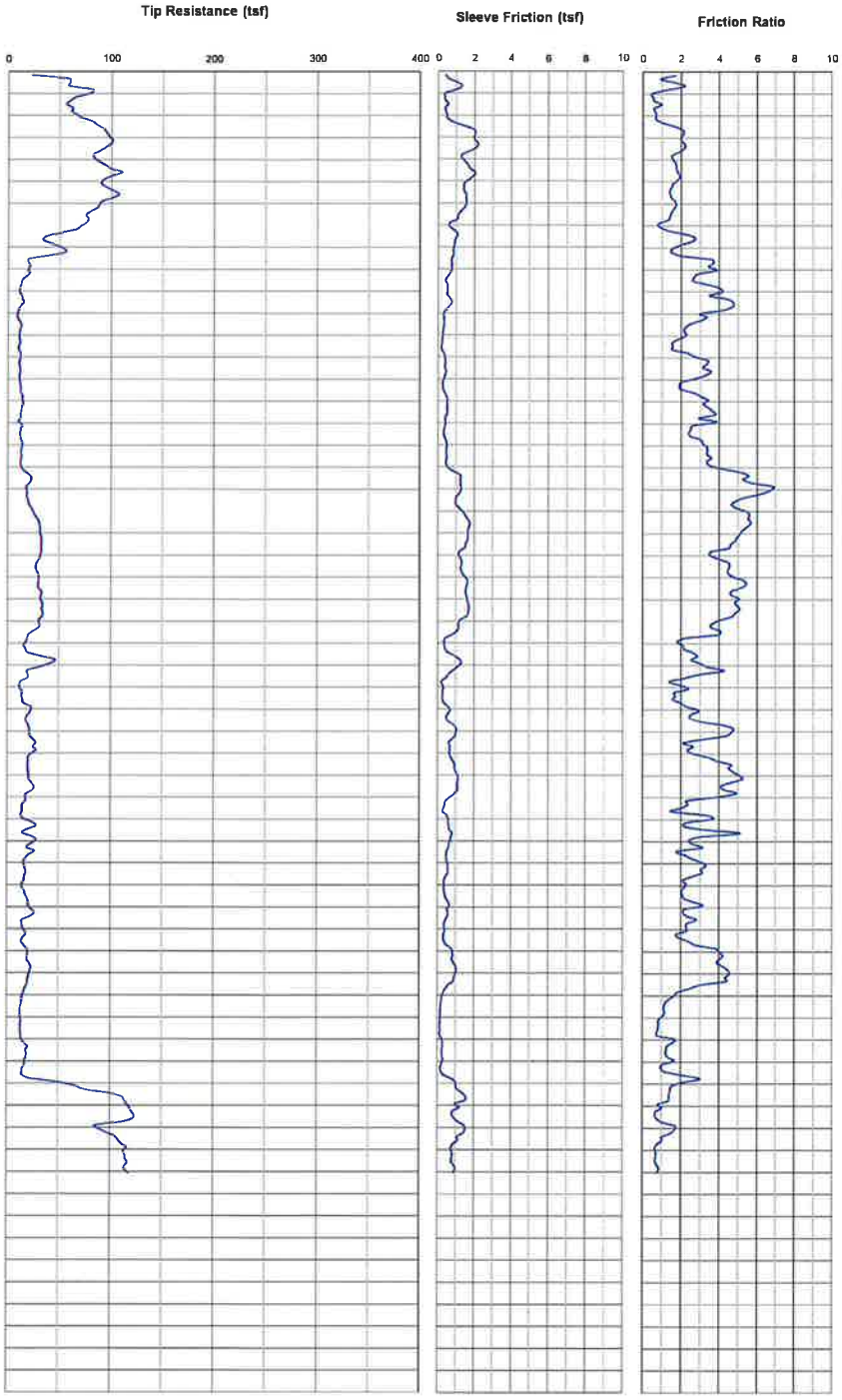
CONE SOUNDING DATA CPT-7

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

DEPTH			
	Silty Sand to Sandy Silt	SM/ML	very dense
	Sand to Silty Sand	SP/SM	very dense
	Silty Sand to Sandy Silt	SM/ML	very dense
	Silty Sand to Sandy Silt	" "	very dense
5	Silty Sand to Sandy Silt	" "	very dense
	Sand to Silty Sand	SP/SM	dense
	Sand to Silty Sand	" "	dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Silty Clay to Clay	CL	stiff
10	Clay	CL/CH	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Silty Clay to Clay	CL	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
15	Silty Clay to Clay	CL	stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Silty Clay to Clay	CL	stiff
	Clay	CL/CH	very stiff
	Clay	" "	very stiff
20	Clay	" "	very stiff
	Silty Clay to Clay	CL	very stiff
	Silty Clay to Clay	" "	very stiff
	Clay	CL/CH	very stiff
	Silty Clay to Clay	CL	very stiff
25	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sandy Silt to Clayey Silt	ML	loose
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	very stiff
30	Clayey Silt to Silty Clay	" "	very stiff
	Silty Clay to Clay	CL	very stiff
	Silty Clay to Clay	" "	very stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	very stiff
35	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	stiff
40	Silty Clay to Clay	CL	very stiff
	Clayey Silt to Silty Clay	ML/CL	stiff
	Sandy Silt to Clayey Silt	ML	very loose
	Sandy Silt to Clayey Silt	" "	very loose
	Sandy Silt to Clayey Silt	" "	very loose
45	Sandy Silt to Clayey Silt	" "	loose
	Sand to Silty Sand	SP/SM	medium dense
	Sand to Silty Sand	" "	medium dense
	Sand to Silty Sand	" "	medium dense
50	Sand	SP	medium dense
55			

END OF SOUNDING AT 50 ft.



Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-7

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-7

Est. GWT (ft): 6

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk; Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	47.21	1.43	Silty Sand to Sandy Silt	SM/ML	very dense	115	10	89.2	30	112	44		
0.30	1.0	73.28	1.26	Silty Sand to Sandy Silt	SM/ML	very dense	115	16	138.5	25	109	43		
0.45	1.5	60.55	0.68	Sand to Silty Sand	SP/SM	very dense	115	11	114.5	15	96	41		
0.60	2.0	63.54	0.62	Sand to Silty Sand	SP/SM	very dense	115	12	120.1	15	92	41		
0.75	2.5	79.95	1.06	Sand to Silty Sand	SP/SM	very dense	115	15	151.1	20	95	41		
0.93	3.0	95.41	2.05	Silty Sand to Sandy Silt	SM/ML	very dense	115	21	180.4	25	97	42		
1.08	3.5	98.65	2.10	Silty Sand to Sandy Silt	SM/ML	very dense	115	22	186.5	25	96	41		
1.23	4.0	85.69	1.66	Silty Sand to Sandy Silt	SM/ML	dense	115	19	162.0	25	90	41		
1.38	4.5	94.17	1.71	Silty Sand to Sandy Silt	SM/ML	very dense	115	21	178.0	25	91	41		
1.53	5.0	100.72	1.84	Silty Sand to Sandy Silt	SM/ML	very dense	115	22	187.4	25	91	41		
1.68	5.5	98.44	1.45	Sand to Silty Sand	SP/SM	dense	115	18	174.2	20	89	40		
1.83	6.0	93.26	1.62	Silty Sand to Sandy Silt	SM/ML	dense	115	21	157.7	25	86	40		
1.98	6.5	80.43	1.48	Silty Sand to Sandy Silt	SM/ML	dense	115	16	130.4	25	80	39		
2.13	7.0	74.89	0.99	Sand to Silty Sand	SP/SM	dense	115	14	116.9	20	77	39		
2.28	7.5	49.39	2.07	Sandy Silt to Clayey Silt	ML	medium dense	115	14	74.4	40	64	37		
2.45	8.0	44.38	2.00	Sandy Silt to Clayey Silt	ML	medium dense	115	13	64.6	40	60	36		
2.60	8.5	38.69	2.35	Sandy Silt to Clayey Silt	ML	medium dense	115	11	55.5	45	55	36		
2.75	9.0	20.04	3.65	Silty Clay to Clay	CL	very stiff	125	11		75			1.15	>10
2.90	9.5	17.31	2.70	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		70			0.99	>10
3.05	10.0	11.70	3.86	Clay	CL/CH	stiff	125	9		100			0.66	>10
3.20	10.5	14.04	4.22	Clay	CL/CH	stiff	125	11		95			0.80	>10
3.35	11.0	10.52	3.97	Clay	CL/CH	stiff	125	8		100			0.59	7.13
3.50	11.5	10.73	2.89	Silty Clay to Clay	CL	stiff	125	6		95			0.60	9.59
3.65	12.0	11.25	2.19	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.63	>10
3.80	12.5	10.97	1.65	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		85			0.61	>10
3.95	13.0	11.40	2.19	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.64	>10
4.13	13.5	11.01	3.27	Silty Clay to Clay	CL	stiff	125	6		100			0.61	8.27
4.28	14.0	11.25	3.19	Silty Clay to Clay	CL	stiff	125	6		100			0.63	8.14
4.43	14.5	11.88	1.94	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.66	>10
4.58	15.0	13.52	3.02	Silty Clay to Clay	CL	stiff	125	8		95			0.76	>10
4.73	15.5	13.86	3.38	Silty Clay to Clay	CL	stiff	125	8		100			0.78	>10
4.88	16.0	12.17	3.28	Silty Clay to Clay	CL	stiff	125	7		100			0.68	8.00
5.03	16.5	12.19	2.45	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.68	>10
5.18	17.0	13.43	3.16	Silty Clay to Clay	CL	stiff	125	8		100			0.75	8.85
5.33	17.5	12.76	3.42	Silty Clay to Clay	CL	stiff	125	7		100			0.71	7.70
5.48	18.0	12.72	3.62	Silty Clay to Clay	CL	stiff	125	7		100			0.70	7.41
5.65	18.5	20.62	5.31	Clay	CL/CH	very stiff	125	16		100			1.17	>10
5.80	19.0	19.19	6.42	Clay	CL/CH	very stiff	125	15		100			1.08	>10
5.95	19.5	18.89	5.46	Clay	CL/CH	very stiff	125	15		100			1.06	>10
6.10	20.0	22.62	5.01	Clay	CL/CH	very stiff	125	18		100			1.28	>10
6.25	20.5	28.62	5.58	Clay	CL/CH	very stiff	125	23		95			1.63	>10
6.40	21.0	31.41	5.27	Clay	CL/CH	very stiff	125	25		90			1.80	>10
6.55	21.5	32.74	4.78	Silty Clay to Clay	CL	very stiff	125	19		85			1.88	>10
6.70	22.0	32.38	3.85	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		80			1.85	>10
6.85	22.5	29.20	4.31	Silty Clay to Clay	CL	very stiff	125	17		90			1.67	>10
7.00	23.0	29.05	4.55	Silty Clay to Clay	CL	very stiff	125	17		90			1.66	>10
7.18	23.5	29.77	5.29	Clay	CL/CH	very stiff	125	24		95			1.70	>10
7.33	24.0	32.41	4.76	Silty Clay to Clay	CL	very stiff	125	19		90			1.85	>10
7.48	24.5	33.47	4.94	Clay	CL/CH	very stiff	125	27		90			1.91	>10
7.63	25.0	32.75	4.50	Silty Clay to Clay	CL	very stiff	125	19		90			1.87	>10
7.78	25.5	29.35	3.74	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		90			1.67	>10
7.93	26.0	19.25	2.63	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		95			1.07	>10
8.08	26.5	20.94	2.42	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		90			1.17	>10
8.23	27.0	39.96	2.97	Sandy Silt to Clayey Silt	ML	medium dense	115	11	38.4	70	44	34		
8.38	27.5	19.65	3.14	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.09	>10
8.53	28.0	12.37	1.90	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		100			0.67	5.42
8.68	28.5	14.28	1.62	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.78	6.76
8.85	29.0	20.29	2.41	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		95			1.13	>10
9.00	29.5	19.04	2.65	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		100			1.06	>10
9.15	30.0	20.83	4.49	Clay	CL/CH	very stiff	125	17		100			1.16	6.65
9.30	30.5	24.92	3.20	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		95			1.40	>10
9.45	31.0	25.50	2.52	Sandy Silt to Clayey Silt	ML	loose	115	7	23.2	90	29	32		
9.60	31.5	19.98	3.97	Silty Clay to Clay	CL	very stiff	125	11		100			1.11	7.56
9.75	32.0	20.34	4.76	Clay	CL/CH	very stiff	125	16		100			1.13	5.88
9.90	32.5	23.44	4.62	Clay	CL/CH	very stiff	125	19		100			1.31	7.27
10.05	33.0	20.46	4.33	Silty Clay to Clay	CL	very stiff	125	12		100			1.13	7.41
10.20	33.5	15.76	2.21	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.86	6.43
10.38	34.0	14.34	2.82	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.77	5.31
10.53	34.5	23.89	2.53	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		95			1.33	>10
10.68	35.0	22.56	3.48	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.25	>10
10.83	35.5	22.80	2.50	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.27	>10
10.98	36.0	18.16	2.57	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		100			0.99	7.41
11.13	36.5	17.17	3.00	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		100			0.93	6.54
11.28	37.0	15.19	2.17	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.82	5.21
11.43	37.5	18.01	2.06	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		100			0.98	6.88
11.58	38.0	21.38	2.64	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.18	9.19
11.73	38.5	21.47	2.41	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		100			1.18	9.19

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-7

Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
11.88	39.0	15.40	2.29	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.83	5.00
12.05	39.5	15.86	2.02	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.85	5.21
12.20	40.0	18.52	3.55	Silty Clay to Clay	CL	very stiff	125	11		100			1.01	4.78
12.35	40.5	20.31	4.02	Silty Clay to Clay	CL	very stiff	125	12		100			1.11	5.53
12.50	41.0	22.44	4.42	Silty Clay to Clay	CL	very stiff	125	13		100			1.24	6.43
12.65	41.5	19.89	3.89	Silty Clay to Clay	CL	very stiff	125	11		100			1.08	5.10
12.80	42.0	16.21	1.98	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		100			0.87	4.89
12.95	42.5	14.01	1.20	Sandy Silt to Clayey Silt	ML	very loose	115	4	11.2	100	8	29		
13.10	43.0	12.79	1.05	Sandy Silt to Clayey Silt	ML	very loose	115	4	10.2	100	5	29		
13.25	43.5	13.22	0.82	Sandy Silt to Clayey Silt	ML	very loose	115	4	10.5	100	6	29		
13.40	44.0	13.49	1.05	Sandy Silt to Clayey Silt	ML	very loose	115	4	10.6	100	6	29		
13.58	44.5	18.49	1.34	Sandy Silt to Clayey Silt	ML	very loose	115	5	14.5	100	16	30		
13.73	45.0	18.37	1.39	Sandy Silt to Clayey Silt	ML	very loose	115	5	14.4	100	15	30		
13.88	45.5	15.83	1.03	Sandy Silt to Clayey Silt	ML	very loose	115	5	12.3	100	11	29		
14.03	46.0	29.77	2.38	Sandy Silt to Clayey Silt	ML	loose	115	9	23.1	95	29	32		
14.18	46.5	79.98	1.45	Silty Sand to Sandy Silt	SM/ML	medium dense	115	18	61.8	50	58	36		
14.33	47.0	115.11	1.13	Sand to Silty Sand	SP/SM	medium dense	115	21	88.6	35	69	38		
14.48	47.5	122.21	0.69	Sand	SP	dense	110	19	93.7	25	71	38		
14.63	48.0	94.74	1.47	Silty Sand to Sandy Silt	SM/ML	medium dense	115	21	72.3	45	63	37		
14.78	48.5	103.96	1.16	Sand to Silty Sand	SP/SM	medium dense	115	19	79.1	40	66	37		
14.93	49.0	113.91	0.69	Sand	SP	medium dense	110	18	86.3	30	68	38		
15.10	49.5	115.66	0.67	Sand	SP	medium dense	110	18	87.3	30	68	38		
15.25	50.0	115.39	0.79	Sand	SP	medium dense	110	18	86.8	30	68	38		

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments

CONE PENETROMETER: Kehoe Testing & Engineering Truck Mounted Electric Cone with 30 ton reaction weight

LOCATION: See Site and Boring Location Plan

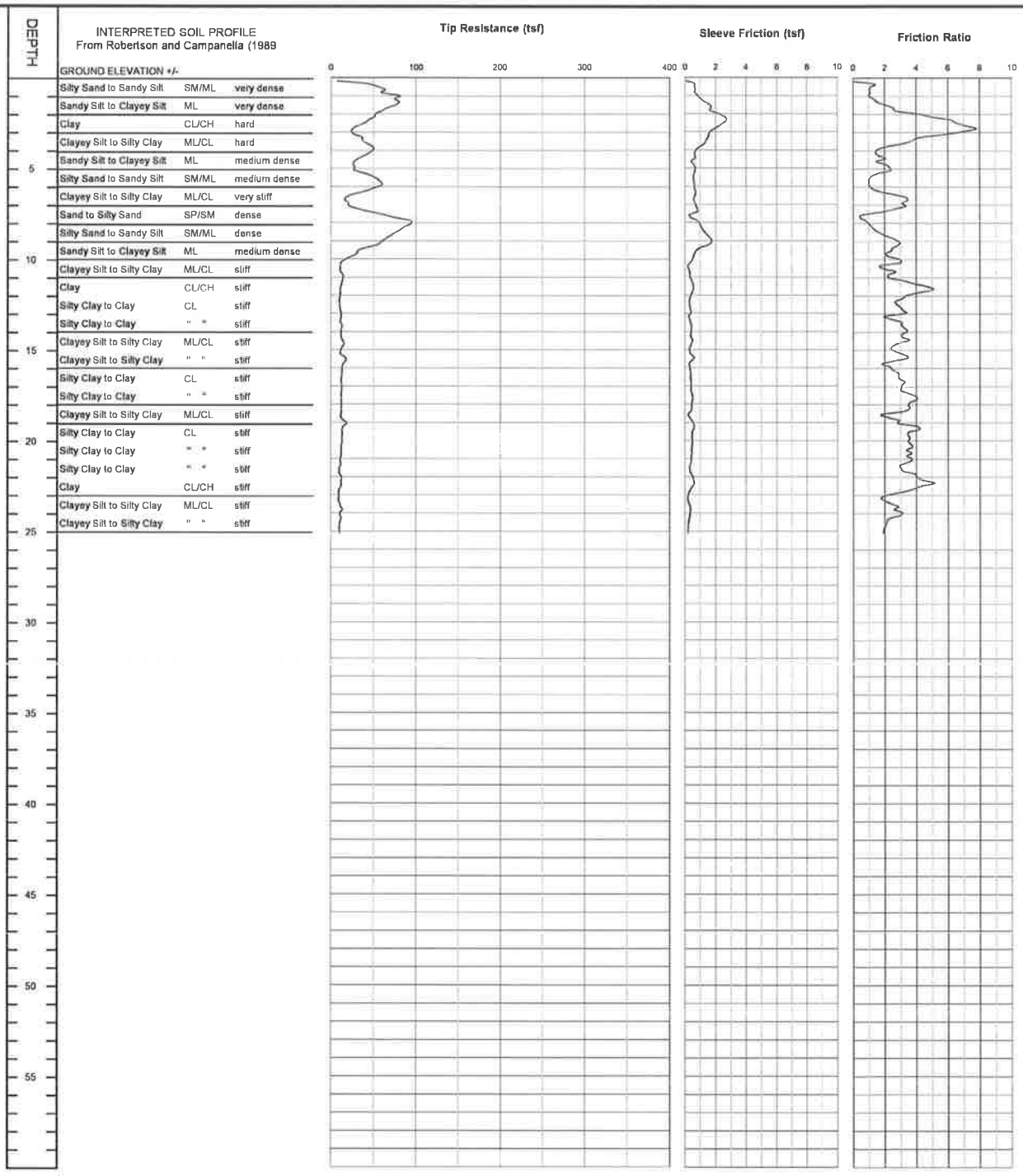
DATE: 11/17/2020

CONE SOUNDING DATA CPT-8

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Silty Sand to Sandy Silt	SM/ML	very dense
Sandy Silt to Clayey Silt	ML	very dense
Clay	CL/CH	hard
Clayey Silt to Silty Clay	ML/CL	hard
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	stiff
Clay	CL/CH	stiff
Silty Clay to Clay	CL	stiff
Silty Clay to Clay	" "	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff
Silty Clay to Clay	CL	stiff
Silty Clay to Clay	" "	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Silty Clay to Clay	CL	stiff
Silty Clay to Clay	" "	stiff
Silty Clay to Clay	" "	stiff
Clay	CL/CH	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff



END OF SOUNDING AT 25 ft.

Project No.		PLATE
LE20178	LANDMARK Geo-Engineers and Geologists	B-8

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Heber Meadows Apartments **Project No:** LE20178 **Date:** 11/17/2020

CONE SOUNDING: CPT-8

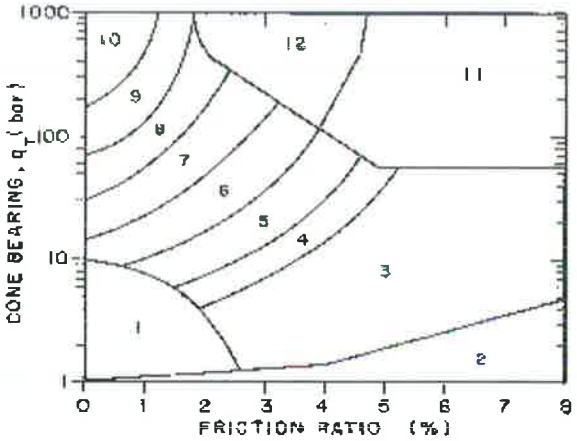
Est. GWT (ft): 8

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17 Su (tsf)	OCR
0.15	0.5	35.25	0.82	Silty Sand to Sandy Silt	SM/ML	very dense	115	8	66.6	30	103	42		
0.30	1.0	67.80	1.04	Sand to Silty Sand	SP/SM	very dense	115	12	128.2	20	107	43		
0.45	1.5	77.00	1.63	Silty Sand to Sandy Silt	SM/ML	very dense	115	17	145.6	25	103	42		
0.60	2.0	59.48	3.12	Sandy Silt to Clayey Silt	ML	very dense	115	17	112.4	45	90	41		
0.75	2.5	45.05	5.85	Clay	CL/CH	hard	125	36		65			2.64	>10
0.93	3.0	26.95	7.25	Clay	CL/CH	very stiff	125	22		90			1.58	>10
1.08	3.5	33.25	4.51	Silty Clay to Clay	CL	very stiff	125	19		65			1.94	>10
1.23	4.0	46.42	2.22	Sandy Silt to Clayey Silt	ML	dense	115	13	87.7	40	71	38		
1.38	4.5	38.95	1.69	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	73.6	40	64	37		
1.53	5.0	26.88	1.94	Sandy Silt to Clayey Silt	ML	medium dense	115	8	49.3	50	52	35		
1.68	5.5	41.91	1.52	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	73.3	35	63	37		
1.83	6.0	55.79	1.05	Silty Sand to Sandy Silt	SM/ML	dense	115	12	93.3	25	70	38		
1.98	6.5	28.52	2.49	Sandy Silt to Clayey Silt	ML	medium dense	115	8	45.8	55	49	35		
2.13	7.0	18.96	3.29	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		75			1.09	>10
2.28	7.5	46.29	1.60	Silty Sand to Sandy Silt	SM/ML	medium dense	115	10	69.0	35	62	37		
2.45	8.0	88.01	0.78	Sand to Silty Sand	SP/SM	dense	115	16	126.9	15	80	39		
2.60	8.5	81.36	1.43	Silty Sand to Sandy Silt	SM/ML	dense	115	18	115.7	25	77	39		
2.75	9.0	64.32	2.53	Sandy Silt to Clayey Silt	ML	medium dense	115	18	90.2	40	69	38		
2.90	9.5	42.50	2.60	Sandy Silt to Clayey Silt	ML	medium dense	115	12	58.8	45	57	36		
3.05	10.0	23.30	2.44	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		60			1.34	>10
3.20	10.5	11.04	2.20	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		85			0.62	>10
3.35	11.0	12.98	2.38	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		80			0.73	>10
3.50	11.5	12.29	3.88	Clay	CL/CH	stiff	125	10		100			0.69	9.00
3.65	12.0	10.71	4.20	Clay	CL/CH	stiff	125	9		100			0.60	6.65
3.80	12.5	9.95	2.85	Silty Clay to Clay	CL	stiff	125	6		100			0.55	7.41
3.95	13.0	10.92	3.16	Silty Clay to Clay	CL	stiff	125	6		100			0.61	8.41
4.13	13.5	11.38	2.48	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		95			0.63	>10
4.28	14.0	12.29	3.23	Silty Clay to Clay	CL	stiff	125	7		100			0.69	9.59
4.43	14.5	12.16	3.26	Silty Clay to Clay	CL	stiff	125	7		100			0.68	8.85
4.58	15.0	13.74	2.59	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.77	>10
4.73	15.5	13.11	3.15	Silty Clay to Clay	CL	stiff	125	7		100			0.73	9.59
4.88	16.0	14.31	2.29	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		90			0.80	>10
5.03	16.5	12.41	2.88	Silty Clay to Clay	CL	stiff	125	7		100			0.69	7.85
5.18	17.0	12.38	3.13	Silty Clay to Clay	CL	stiff	125	7		100			0.69	7.56
5.33	17.5	12.07	3.52	Silty Clay to Clay	CL	stiff	125	7		100			0.67	6.88
5.48	18.0	12.01	3.70	Silty Clay to Clay	CL	stiff	125	7		100			0.66	6.65
5.65	18.5	11.86	2.84	Silty Clay to Clay	CL	stiff	125	7		100			0.65	6.32
5.80	19.0	14.64	2.66	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		95			0.81	>10
5.95	19.5	13.53	3.91	Clay	CL/CH	stiff	125	11		100			0.75	5.65
6.10	20.0	12.96	3.51	Silty Clay to Clay	CL	stiff	125	7		100			0.71	6.54
6.25	20.5	12.20	3.58	Silty Clay to Clay	CL	stiff	125	7		100			0.67	5.76
6.40	21.0	11.41	3.60	Silty Clay to Clay	CL	stiff	125	7		100			0.62	5.00
6.55	21.5	10.68	3.15	Silty Clay to Clay	CL	stiff	125	6		100			0.58	4.37
6.70	22.0	10.53	3.68	Clay	CL/CH	stiff	125	8		100			0.57	3.35
6.85	22.5	11.89	4.60	Clay	CL/CH	stiff	125	10		100			0.65	3.83
7.00	23.0	9.34	3.09	Silty Clay to Clay	CL	firm	125	5		100			0.50	3.35
7.18	23.5	9.43	2.03	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.50	4.28
7.33	24.0	11.74	2.85	Silty Clay to Clay	CL	stiff	125	7		100			0.64	4.47
7.48	24.5	10.89	2.43	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.58	5.21
7.63	25.0	9.83	1.98	Clayey Silt to Silty Clay	ML/CL	stiff	120	4		100			0.52	4.28

Simplified Soil Classification Chart

After Robertson & Campanella (1989)



Geotechnical Parameters from CPT Data:

Equivalent SPT N(60) blow count = Qc/(Qc/N Ratio)

N1(60) = Cn*N(60) Normalized SPT blow count

Cn = 1/(p'o)^0.5 < 1.6 max. from Liao & Whitman (1986)

p'o = effective overburden pressure (tsf) using unit densities given below and estimated groundwater table.

Dr = Relative density (%) from Jamiolkowski et. al. (1986) relationship

= -98 +68*log(Qc/p'o^0.5) where Qc, p'o in tonne/sqm

Note: 1 tonne/sqm = 0.1024 tsf, 1 bar =1.0443 tsf

Phi = Friction Angle estimated from either:

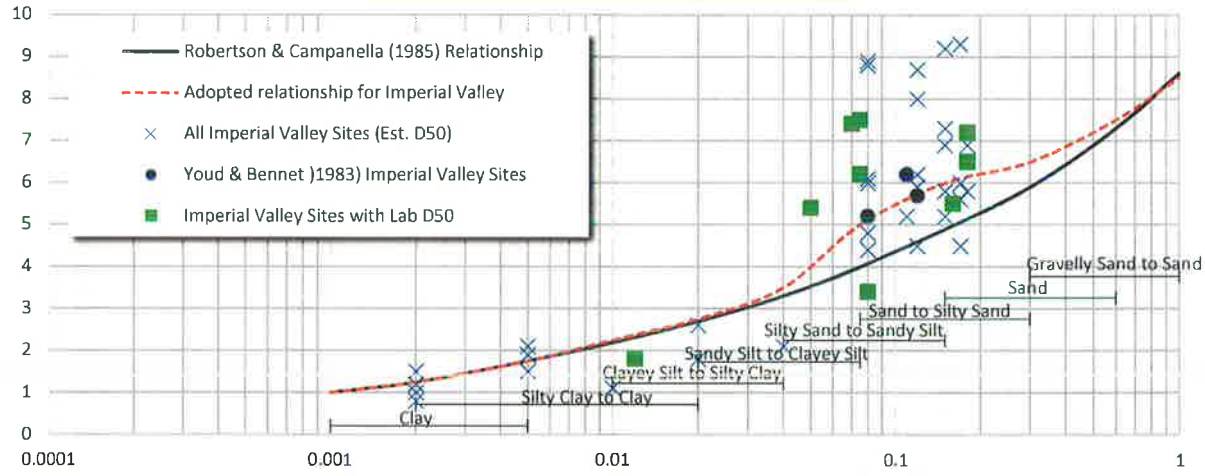
1. Roberton & Campanella (1983) chart:
   Phi = 5.3 + 24*(log(Qc/p'o))+3(log(Qc/p'o))^2
2. Peck, Hansen & Thornburn (1974) N-Phi Correlation
3. Schmertman (1978) chart [Phi = 28+0.14*Dr for fine uniform sands]

Su = undrained shear strength (tsf)

= (Qc-p'o)/Nk where Nk varies from 10 to 22, 17 for OC clays

OCR = Overconsolidation Ratio estimated from Schmertman (1978) chart using Su/p'o ratio and estimated normal consolidated Su/p'o

Variation of Qc/N Ratio with Grain Size



Note: Assumed Properties and Adopted Qc/N Ratio based on correlations from Imperial Valley, California soils

Table of Soil Types and Assumed Properties

Zone	Soil Classification	UCS	Density (pcf)	R&C Qc/N	Adopted Qc/N	Est. PI	Fines (%)	D50 (mm)
1	Sensitive fine grained	ML	120	2	2	NP-15	65-100	0.02
2	Organic Material	OL/OH	120	1	1	--	--	--
3	Clay	CL/CH	125	1	1.25	25-40+	90-100	0.002
4	Silty Clay to Clay	CL	125	1.5	2	15-40	90-100	0.01
5	Clayey Silt to Silty Clay	ML/CL	120	2	2.75	25-May	90-100	0.02
6	Sandy Silt to Clayey Silt	ML	115	2.5	3.5	NP-10	65-100	0.04
7	Silty Sand to Sandy Silt	SM/ML	115	3	5	NP	35-75	0.075
8	Sand to Silty Sand	SP/SM	115	4	6	NP	May-35	0.15
9	Sand	SP	110	5	6.5	NP	0-5	0.3
10	Gravelly Sand to Sand	SW	115	6	7.5	NP	0-5	0.6
11	Overconsolidated Soil	--	120	1	1	NP	90-100	0.01
12	Sand to Clayey Sand	SP/SC	115	2	2	NP-5	--	--

Su (tsf)	Consistency
0-0.13	very soft
0.13-.25	soft
0.25-0.5	firm
0.5-1.0	stiff
1.0-2.0	very stiff
>2.0	hard
Dr (%)	**Relative Density**
0-15	very loose
15-35	loose
35-65	medium dense
65-85	dense
>85	very dense

LANDMARK
Geo-Engineers and Geologists

Project No: LE20178

Key to CPT Interpretation of Logs

Plate B-9

APPENDIX C

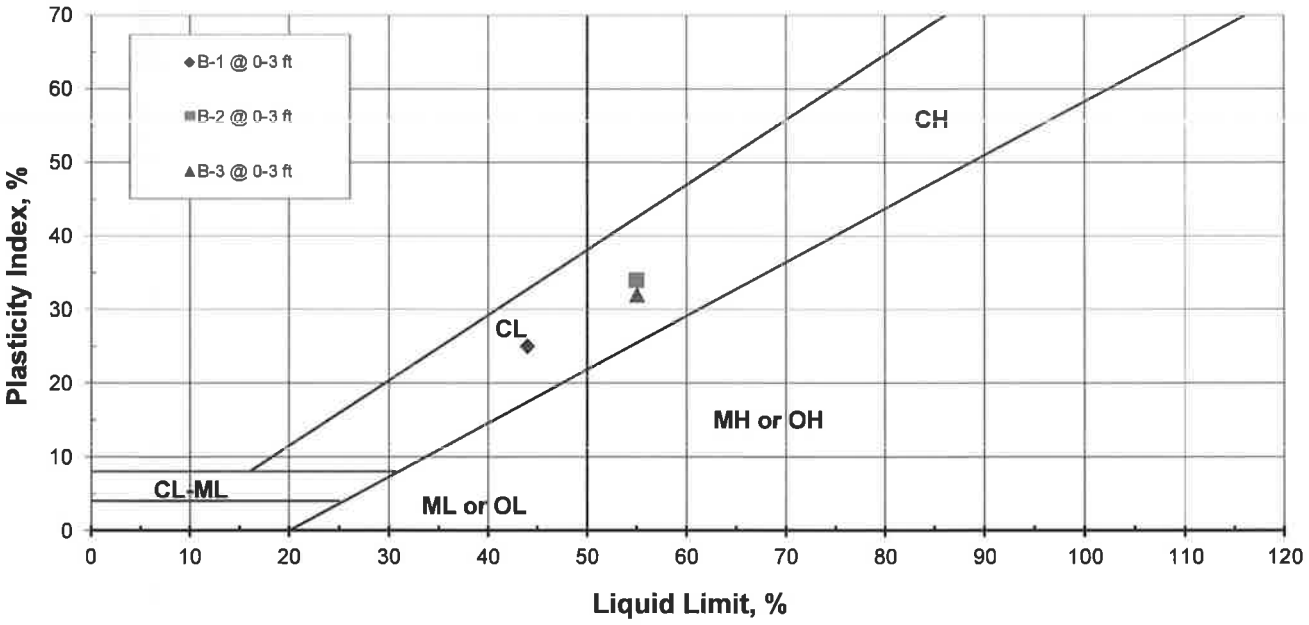
LANDMARK CONSULTANTS, INC.

CLIENT: Chelsea Investments
PROJECT: Heber Meadows Apartments
JOB No.: LE20178
DATE: 12/15/20

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classification
B-1	0-3	44	19	25	CL
B-2	0-3	55	21	34	CH
B-3	0-3	55	23	32	CH

PLASTICITY CHART



LANDMARK
Geo-Engineers and Geologists

Project No.: LE20178

Atterberg Limits Test Results

Plate C-1

LANDMARK CONSULTANTS, INC.

CLIENT: Meber Meadows I, LLC
PROJECT: Heber Meadows Apartments - Heber, CA
JOB NO: LE20178
DATE: 12/4/2020

EXPANSION INDEX TEST (UBC 29-2 & ASTM D4829)

Sample Location & Depth (ft)	Initial Moisture (%)	Compacted Dry Density (pcf)	Final Moisture (%)	Volumetric Swell (%)	Expansion Index (EI)	Expansive Potential
B-1 0-3 ft.	8.6	115.1	16.7	2.8	28	Low
B-2,3,4 0-3 ft.	11.1	96.6	32.9	9.0	82	Medium

UBC CLASSIFICATION

0-20	Very Low
20-50	Low
50-90	Medium
90-130	High
130+	Very High

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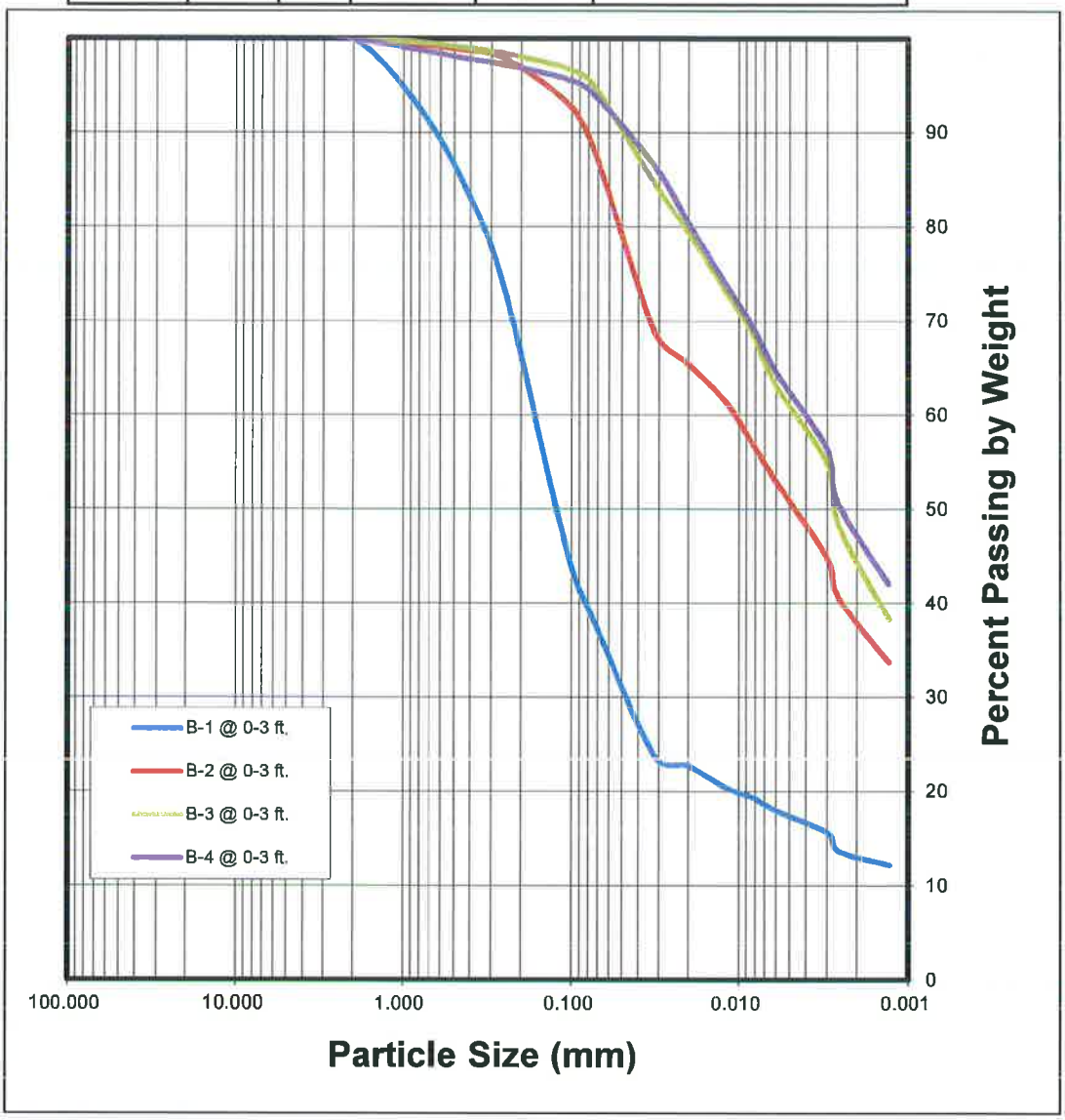
Geo-Engineers and Geologists
Project No.: LE20178

Expansion Index Test Results

Plate C-2

SIEVE ANALYSIS					HYDROMETER ANALYSIS
Gravel		Sand			Silt and Clay Fraction
Coarse	Fine	Coarse	Medium	Fine	



LANDMARK
Geo-Engineers and Geologists

Project No.: LE20178

Grain Size Analysis

Plate C-3

LANDMARK CONSULTANTS, INC.

CLIENT: Heber Meadows I, LLC
PROJECT: Heber Meadows Apartments - Heber, CA
JOB No.: LE20178
DATE: 12/04/20

CHEMICAL ANALYSIS

Boring:	B-1	B-2	B-3	B-4	Caltrans
Sample Depth, ft:	0-3	0-3	0-3	0-3	Method
pH:	7.7	7.3	7.3	7.3	643
Electrical Conductivity (mmhos):	--	--	--	--	424
Resistivity (ohm-cm):	320	220	230	180	643
Chloride (Cl), ppm:	700	1,600	2,140	2,320	422
Sulfate (SO4), ppm:	--	3,048	2,934	6,552	417

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Range of Values	Degree of Corrosivity
Concrete	Soluble Sulfates (ppm)	0 - 1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides (ppm)	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity (ohm-cm)	1 - 1,000	Very Severe
		1,000 - 2,000	Severe
		2,000 - 10,000	Moderate
		> 10,000	Low

LANDMARK
Geo-Engineers and Geologists

Project No.: LE20178

Selected Chemical Test Results

Plate C-4

APPENDIX D

LANDMARK
Geo-Engineers and Geologists

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243

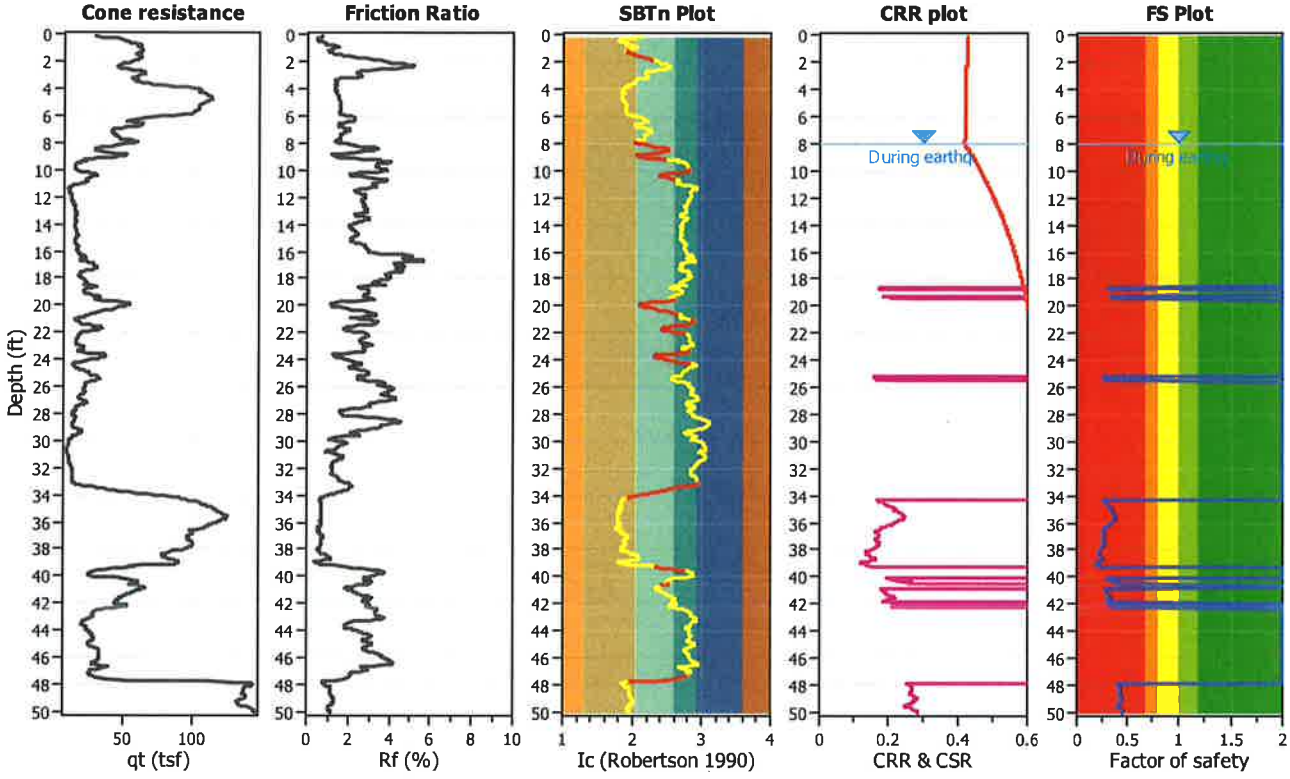
LIQUEFACTION ANALYSIS REPORT

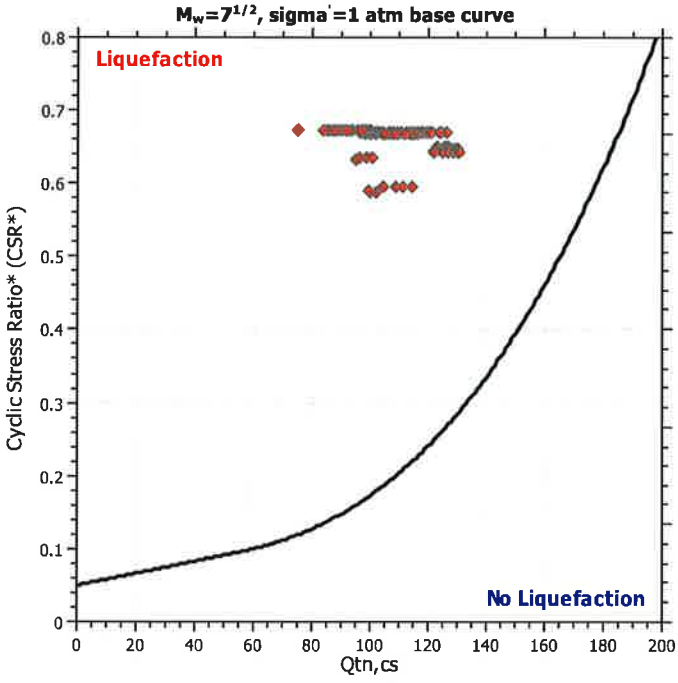
Project title : Heber Meadows Apartments **Location : Heber, CA**

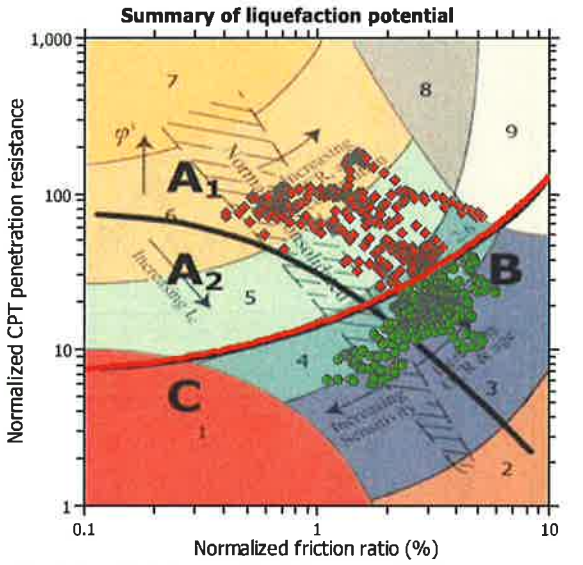
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	8.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	8.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

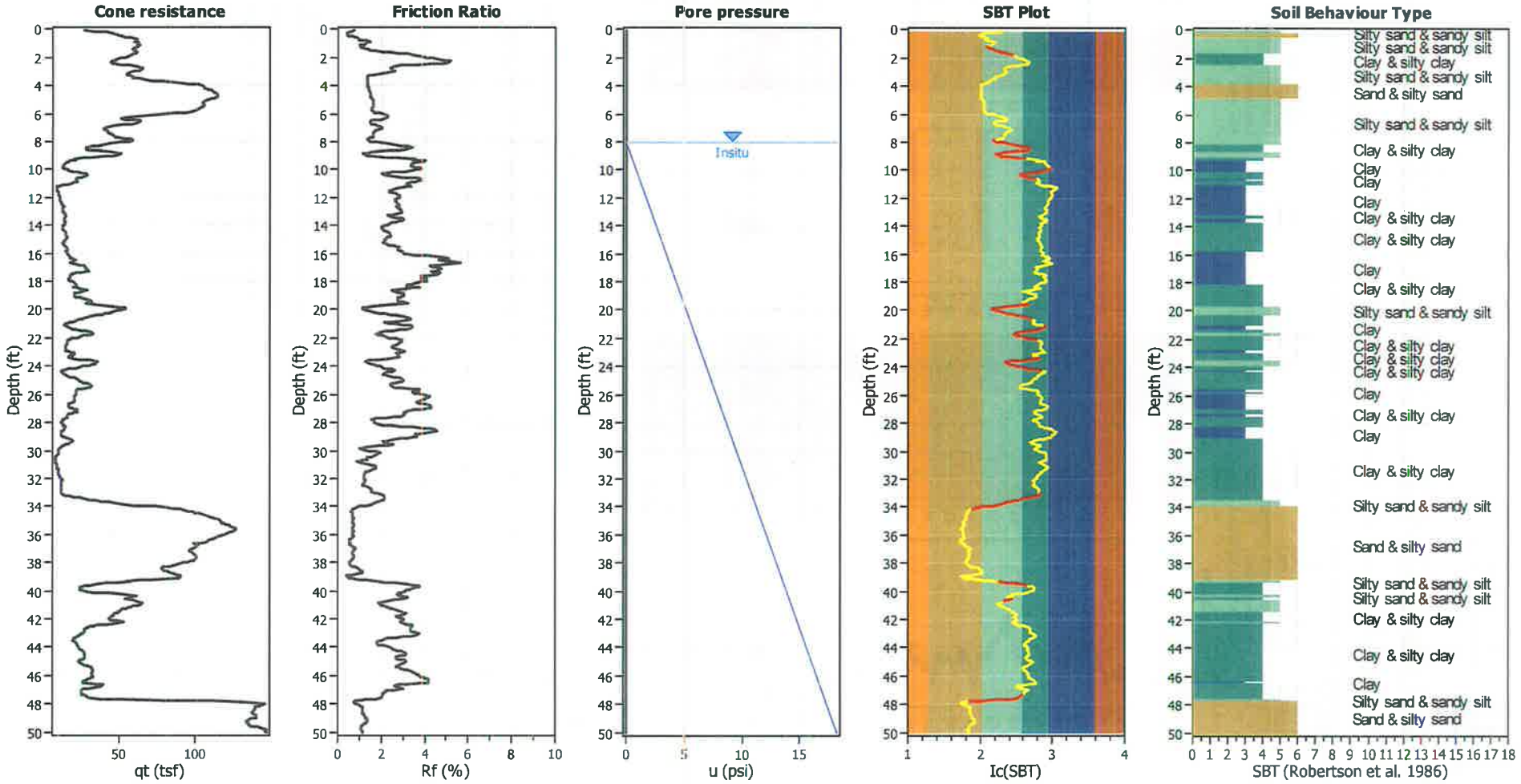






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



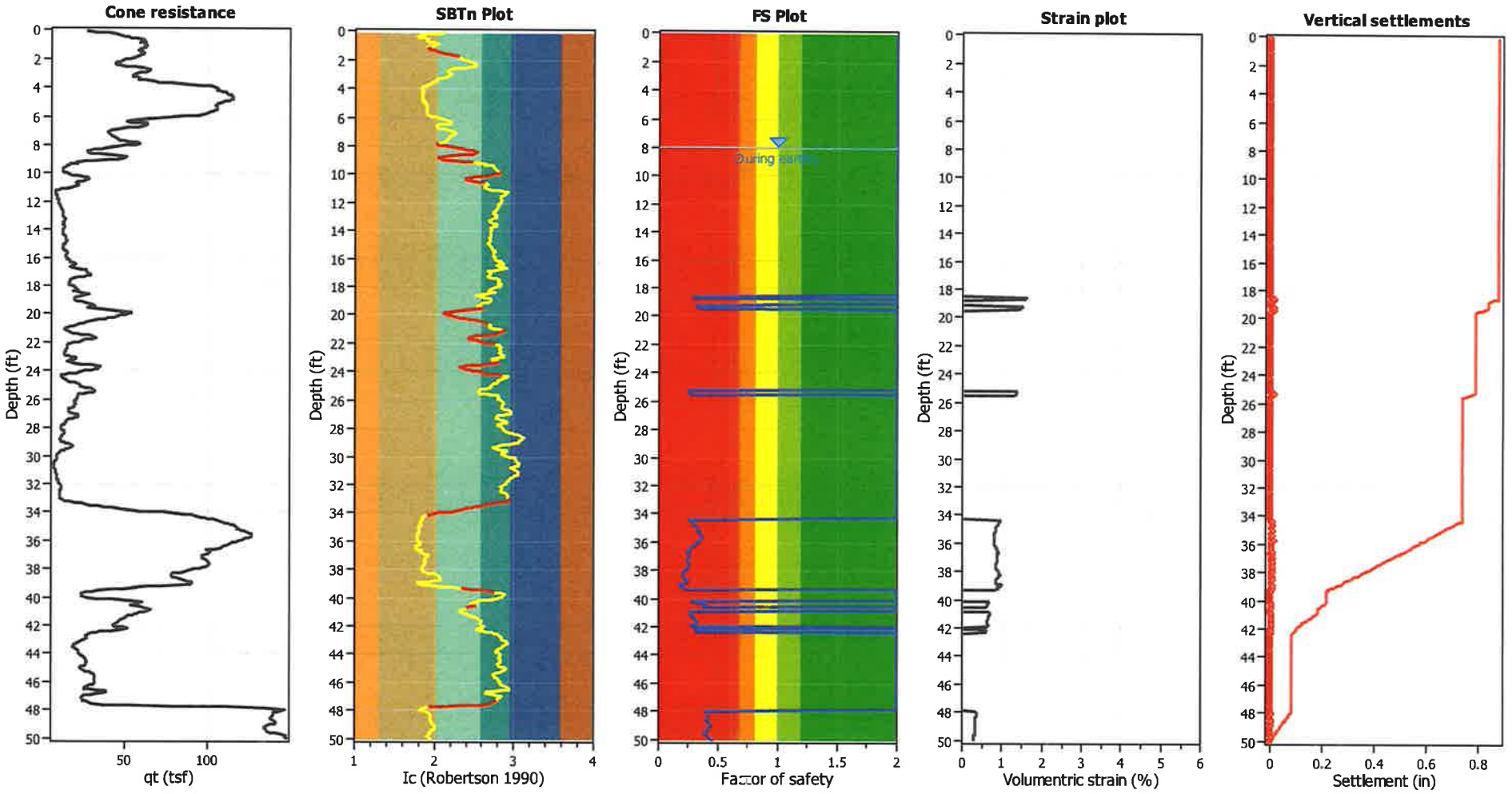
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	8.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
8.02	126.22	2.00	0.00	0.86	0.00	8.15	128.02	2.00	0.00	0.86	0.00
8.20	131.04	2.00	0.00	0.86	0.00	8.28	132.02	2.00	0.00	0.86	0.00
8.32	132.92	2.00	0.00	0.86	0.00	8.39	132.01	2.00	0.00	0.86	0.00
8.46	129.15	2.00	0.00	0.86	0.00	8.50	124.72	2.00	0.00	0.86	0.00
8.58	121.18	2.00	0.00	0.85	0.00	8.63	117.63	2.00	0.00	0.85	0.00
8.76	109.39	2.00	0.00	0.85	0.00	8.81	108.68	2.00	0.00	0.85	0.00
8.87	105.31	2.00	0.00	0.85	0.00	8.94	106.94	2.00	0.00	0.85	0.00
8.99	104.08	2.00	0.00	0.85	0.00	9.07	104.20	2.00	0.00	0.85	0.00
9.12	108.42	2.00	0.00	0.85	0.00	9.15	112.61	2.00	0.00	0.84	0.00
9.21	117.90	2.00	0.00	0.84	0.00	9.35	117.51	2.00	0.00	0.84	0.00
9.39	118.29	2.00	0.00	0.84	0.00	9.43	113.68	2.00	0.00	0.84	0.00
9.48	107.44	2.00	0.00	0.84	0.00	9.53	100.71	2.00	0.00	0.84	0.00
9.65	96.58	2.00	0.00	0.84	0.00	9.71	94.86	2.00	0.00	0.84	0.00
9.77	95.95	2.00	0.00	0.83	0.00	9.83	98.17	2.00	0.00	0.83	0.00
9.87	102.22	2.00	0.00	0.83	0.00	9.95	105.12	2.00	0.00	0.83	0.00
10.01	106.37	2.00	0.00	0.83	0.00	10.09	105.73	2.00	0.00	0.83	0.00
10.14	104.28	2.00	0.00	0.83	0.00	10.20	101.35	2.00	0.00	0.83	0.00
10.26	99.65	2.00	0.00	0.83	0.00	10.31	99.71	2.00	0.00	0.83	0.00
10.38	103.15	2.00	0.00	0.82	0.00	10.44	110.02	2.00	0.00	0.82	0.00
10.57	116.55	2.00	0.00	0.82	0.00	10.62	122.48	2.00	0.00	0.82	0.00
10.69	124.61	2.00	0.00	0.82	0.00	10.75	125.38	2.00	0.00	0.82	0.00
10.81	125.27	2.00	0.00	0.82	0.00	10.88	121.44	2.00	0.00	0.82	0.00
10.93	114.65	2.00	0.00	0.81	0.00	10.98	105.78	2.00	0.00	0.81	0.00
11.06	99.06	2.00	0.00	0.81	0.00	11.11	92.79	2.00	0.00	0.81	0.00
11.18	86.73	2.00	0.00	0.81	0.00	11.24	80.02	2.00	0.00	0.81	0.00
11.31	75.23	2.00	0.00	0.81	0.00	11.39	72.14	2.00	0.00	0.81	0.00
11.46	71.01	2.00	0.00	0.81	0.00	11.50	71.09	2.00	0.00	0.81	0.00
11.56	72.52	2.00	0.00	0.80	0.00	11.64	74.88	2.00	0.00	0.80	0.00
11.73	77.32	2.00	0.00	0.80	0.00	11.77	79.10	2.00	0.00	0.80	0.00
11.85	80.17	2.00	0.00	0.80	0.00	11.90	80.94	2.00	0.00	0.80	0.00
11.98	81.10	2.00	0.00	0.80	0.00	12.03	80.76	2.00	0.00	0.80	0.00
12.12	80.22	2.00	0.00	0.79	0.00	12.15	79.85	2.00	0.00	0.79	0.00
12.23	79.85	2.00	0.00	0.79	0.00	12.28	80.20	2.00	0.00	0.79	0.00
12.36	81.29	2.00	0.00	0.79	0.00	12.42	84.06	2.00	0.00	0.79	0.00
12.51	86.35	2.00	0.00	0.79	0.00	12.60	87.14	2.00	0.00	0.79	0.00
12.64	86.56	2.00	0.00	0.79	0.00	12.69	86.46	2.00	0.00	0.78	0.00
12.74	86.92	2.00	0.00	0.78	0.00	12.82	87.08	2.00	0.00	0.78	0.00
12.87	87.49	2.00	0.00	0.78	0.00	12.96	88.08	2.00	0.00	0.78	0.00
13.00	89.07	2.00	0.00	0.78	0.00	13.09	90.01	2.00	0.00	0.78	0.00
13.13	88.62	2.00	0.00	0.78	0.00	13.22	84.52	2.00	0.00	0.78	0.00
13.27	81.66	2.00	0.00	0.78	0.00	13.36	82.53	2.00	0.00	0.77	0.00
13.42	86.67	2.00	0.00	0.77	0.00	13.48	89.34	2.00	0.00	0.77	0.00
13.52	90.44	2.00	0.00	0.77	0.00	13.63	89.89	2.00	0.00	0.77	0.00
13.70	88.25	2.00	0.00	0.77	0.00	13.75	85.86	2.00	0.00	0.77	0.00
13.81	83.29	2.00	0.00	0.77	0.00	13.88	80.73	2.00	0.00	0.76	0.00
13.93	77.88	2.00	0.00	0.76	0.00	14.01	75.59	2.00	0.00	0.76	0.00
14.06	74.29	2.00	0.00	0.76	0.00	14.13	73.55	2.00	0.00	0.76	0.00
14.24	73.52	2.00	0.00	0.76	0.00	14.30	74.40	2.00	0.00	0.76	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
14.37	76.30	2.00	0.00	0.76	0.00	14.43	78.41	2.00	0.00	0.76	0.00
14.49	80.65	2.00	0.00	0.75	0.00	14.55	81.54	2.00	0.00	0.75	0.00
14.67	83.68	2.00	0.00	0.75	0.00	14.72	83.85	2.00	0.00	0.75	0.00
14.78	83.84	2.00	0.00	0.75	0.00	14.85	82.13	2.00	0.00	0.75	0.00
14.90	80.37	2.00	0.00	0.75	0.00	14.96	78.97	2.00	0.00	0.75	0.00
15.02	76.97	2.00	0.00	0.75	0.00	15.07	75.95	2.00	0.00	0.74	0.00
15.13	75.18	2.00	0.00	0.74	0.00	15.21	74.73	2.00	0.00	0.74	0.00
15.26	74.28	2.00	0.00	0.74	0.00	15.30	75.48	2.00	0.00	0.74	0.00
15.38	78.23	2.00	0.00	0.74	0.00	15.44	82.69	2.00	0.00	0.74	0.00
15.51	86.28	2.00	0.00	0.74	0.00	15.56	88.53	2.00	0.00	0.74	0.00
15.64	89.04	2.00	0.00	0.73	0.00	15.69	89.32	2.00	0.00	0.73	0.00
15.80	89.99	2.00	0.00	0.73	0.00	15.87	91.13	2.00	0.00	0.73	0.00
15.92	92.01	2.00	0.00	0.73	0.00	16.00	92.68	2.00	0.00	0.73	0.00
16.04	96.08	2.00	0.00	0.73	0.00	16.13	102.45	2.00	0.00	0.73	0.00
16.17	111.92	2.00	0.00	0.73	0.00	16.24	120.48	2.00	0.00	0.72	0.00
16.30	127.10	2.00	0.00	0.72	0.00	16.35	129.61	2.00	0.00	0.72	0.00
16.43	130.45	2.00	0.00	0.72	0.00	16.47	130.65	2.00	0.00	0.72	0.00
16.54	132.22	2.00	0.00	0.72	0.00	16.64	132.89	2.00	0.00	0.72	0.00
16.69	132.87	2.00	0.00	0.72	0.00	16.75	132.78	2.00	0.00	0.72	0.00
16.84	133.19	2.00	0.00	0.71	0.00	16.89	135.08	2.00	0.00	0.71	0.00
16.95	137.84	2.00	0.00	0.71	0.00	17.01	142.47	2.00	0.00	0.71	0.00
17.10	146.77	2.00	0.00	0.71	0.00	17.14	147.60	2.00	0.00	0.71	0.00
17.24	143.40	2.00	0.00	0.71	0.00	17.31	138.24	2.00	0.00	0.71	0.00
17.36	135.18	2.00	0.00	0.71	0.00	17.41	129.98	2.00	0.00	0.71	0.00
17.50	121.26	2.00	0.00	0.70	0.00	17.58	111.36	2.00	0.00	0.70	0.00
17.63	107.13	2.00	0.00	0.70	0.00	17.69	106.95	2.00	0.00	0.70	0.00
17.76	106.96	2.00	0.00	0.70	0.00	17.80	107.81	2.00	0.00	0.70	0.00
17.85	108.81	2.00	0.00	0.70	0.00	17.95	110.31	2.00	0.00	0.70	0.00
18.01	110.91	2.00	0.00	0.69	0.00	18.06	109.50	2.00	0.00	0.69	0.00
18.18	106.39	2.00	0.00	0.69	0.00	18.24	104.47	2.00	0.00	0.69	0.00
18.30	104.68	2.00	0.00	0.69	0.00	18.37	106.08	2.00	0.00	0.69	0.00
18.42	109.38	2.00	0.00	0.69	0.00	18.44	108.23	2.00	0.00	0.69	0.00
18.51	106.21	2.00	0.00	0.69	0.00	18.60	101.76	0.30	1.58	0.68	0.02
18.65	100.08	0.29	1.60	0.68	0.01	18.72	99.45	0.29	1.60	0.68	0.01
18.78	99.05	2.00	0.00	0.68	0.00	18.84	99.18	2.00	0.00	0.68	0.00
18.91	98.60	2.00	0.00	0.68	0.00	19.00	97.89	2.00	0.00	0.68	0.00
19.04	97.29	2.00	0.00	0.68	0.00	19.12	97.56	2.00	0.00	0.68	0.00
19.17	100.64	2.00	0.00	0.68	0.00	19.26	104.17	0.31	1.52	0.67	0.02
19.30	108.63	0.33	1.47	0.67	0.01	19.39	111.38	0.35	1.44	0.67	0.02
19.44	114.19	0.37	1.41	0.67	0.01	19.53	114.67	2.00	0.00	0.67	0.00
19.57	111.79	2.00	0.00	0.67	0.00	19.62	102.98	2.00	0.00	0.67	0.00
19.71	94.89	2.00	0.00	0.67	0.00	19.81	91.53	2.00	0.00	0.66	0.00
19.87	90.45	2.00	0.00	0.66	0.00	19.91	90.96	2.00	0.00	0.66	0.00
19.96	90.88	2.00	0.00	0.66	0.00	20.05	91.18	2.00	0.00	0.66	0.00
20.10	92.53	2.00	0.00	0.66	0.00	20.15	96.57	2.00	0.00	0.66	0.00
20.23	101.52	2.00	0.00	0.66	0.00	20.29	106.71	2.00	0.00	0.66	0.00
20.36	109.53	2.00	0.00	0.65	0.00	20.41	111.67	2.00	0.00	0.65	0.00
20.49	112.97	2.00	0.00	0.65	0.00	20.60	112.70	2.00	0.00	0.65	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.67	110.58	2.00	0.00	0.65	0.00	20.72	107.66	2.00	0.00	0.65	0.00
20.77	96.83	2.00	0.00	0.65	0.00	20.84	86.57	2.00	0.00	0.65	0.00
20.89	76.88	2.00	0.00	0.65	0.00	20.94	78.18	2.00	0.00	0.65	0.00
21.02	80.22	2.00	0.00	0.64	0.00	21.07	83.62	2.00	0.00	0.64	0.00
21.14	88.17	2.00	0.00	0.64	0.00	21.20	92.56	2.00	0.00	0.64	0.00
21.31	95.18	2.00	0.00	0.64	0.00	21.37	95.90	2.00	0.00	0.64	0.00
21.41	95.02	2.00	0.00	0.64	0.00	21.48	93.01	2.00	0.00	0.64	0.00
21.55	91.12	2.00	0.00	0.63	0.00	21.61	89.11	2.00	0.00	0.63	0.00
21.68	87.70	2.00	0.00	0.63	0.00	21.72	86.73	2.00	0.00	0.63	0.00
21.80	86.48	2.00	0.00	0.63	0.00	21.85	86.41	2.00	0.00	0.63	0.00
21.98	86.75	2.00	0.00	0.63	0.00	22.03	87.53	2.00	0.00	0.63	0.00
22.09	87.46	2.00	0.00	0.63	0.00	22.17	86.66	2.00	0.00	0.62	0.00
22.24	85.61	2.00	0.00	0.62	0.00	22.30	84.86	2.00	0.00	0.62	0.00
22.35	83.63	2.00	0.00	0.62	0.00	22.42	81.65	2.00	0.00	0.62	0.00
22.48	79.49	2.00	0.00	0.62	0.00	22.54	77.62	2.00	0.00	0.62	0.00
22.61	76.81	2.00	0.00	0.62	0.00	22.66	76.78	2.00	0.00	0.62	0.00
22.73	78.24	2.00	0.00	0.61	0.00	22.83	81.73	2.00	0.00	0.61	0.00
22.91	85.19	2.00	0.00	0.61	0.00	22.96	87.84	2.00	0.00	0.61	0.00
23.03	88.74	2.00	0.00	0.61	0.00	23.09	89.31	2.00	0.00	0.61	0.00
23.16	90.43	2.00	0.00	0.61	0.00	23.21	87.96	2.00	0.00	0.61	0.00
23.27	86.01	2.00	0.00	0.61	0.00	23.33	83.29	2.00	0.00	0.60	0.00
23.40	83.09	2.00	0.00	0.60	0.00	23.45	80.55	2.00	0.00	0.60	0.00
23.53	76.99	2.00	0.00	0.60	0.00	23.58	74.46	2.00	0.00	0.60	0.00
23.63	74.55	2.00	0.00	0.60	0.00	23.71	76.68	2.00	0.00	0.60	0.00
23.80	79.34	2.00	0.00	0.60	0.00	23.84	81.89	2.00	0.00	0.60	0.00
23.89	83.14	2.00	0.00	0.60	0.00	23.96	83.69	2.00	0.00	0.59	0.00
24.02	82.66	2.00	0.00	0.59	0.00	24.14	80.72	2.00	0.00	0.59	0.00
24.19	78.21	2.00	0.00	0.59	0.00	24.26	75.67	2.00	0.00	0.59	0.00
24.32	72.91	2.00	0.00	0.59	0.00	24.37	70.42	2.00	0.00	0.59	0.00
24.43	68.51	2.00	0.00	0.59	0.00	24.50	67.31	2.00	0.00	0.58	0.00
24.55	67.55	2.00	0.00	0.58	0.00	24.63	70.14	2.00	0.00	0.58	0.00
24.68	75.28	2.00	0.00	0.58	0.00	24.75	82.55	2.00	0.00	0.58	0.00
24.81	89.79	2.00	0.00	0.58	0.00	24.93	95.11	2.00	0.00	0.58	0.00
24.99	97.89	2.00	0.00	0.58	0.00	25.06	97.56	2.00	0.00	0.58	0.00
25.12	96.56	2.00	0.00	0.57	0.00	25.17	94.75	2.00	0.00	0.57	0.00
25.24	95.22	0.25	1.39	0.57	0.01	25.36	96.53	0.26	1.37	0.57	0.02
25.43	98.57	0.27	1.35	0.57	0.01	25.48	100.32	0.27	1.32	0.57	0.01
25.56	103.32	2.00	0.00	0.57	0.00	25.61	108.09	2.00	0.00	0.57	0.00
25.66	107.61	2.00	0.00	0.57	0.00	25.78	104.01	2.00	0.00	0.56	0.00
25.87	99.96	2.00	0.00	0.56	0.00	25.92	101.44	2.00	0.00	0.56	0.00
25.97	104.64	2.00	0.00	0.56	0.00	26.04	107.20	2.00	0.00	0.56	0.00
26.09	108.74	2.00	0.00	0.56	0.00	26.15	107.96	2.00	0.00	0.56	0.00
26.24	106.54	2.00	0.00	0.56	0.00	26.29	105.54	2.00	0.00	0.55	0.00
26.34	104.80	2.00	0.00	0.55	0.00	26.44	102.63	2.00	0.00	0.55	0.00
26.51	99.66	2.00	0.00	0.55	0.00	26.56	96.91	2.00	0.00	0.55	0.00
26.61	96.64	2.00	0.00	0.55	0.00	26.69	96.86	2.00	0.00	0.55	0.00
26.79	98.40	2.00	0.00	0.55	0.00	26.86	99.10	2.00	0.00	0.54	0.00
26.91	100.49	2.00	0.00	0.54	0.00	26.98	101.59	2.00	0.00	0.54	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
27.04	101.56	2.00	0.00	0.54	0.00	27.09	100.04	2.00	0.00	0.54	0.00
27.17	97.07	2.00	0.00	0.54	0.00	27.22	94.30	2.00	0.00	0.54	0.00
27.28	90.80	2.00	0.00	0.54	0.00	27.35	88.03	2.00	0.00	0.54	0.00
27.40	84.89	2.00	0.00	0.54	0.00	27.45	82.11	2.00	0.00	0.53	0.00
27.53	79.08	2.00	0.00	0.53	0.00	27.57	74.82	2.00	0.00	0.53	0.00
27.64	69.16	2.00	0.00	0.53	0.00	27.70	63.00	2.00	0.00	0.53	0.00
27.77	58.96	2.00	0.00	0.53	0.00	27.83	58.06	2.00	0.00	0.53	0.00
27.89	57.99	2.00	0.00	0.53	0.00	27.95	57.81	2.00	0.00	0.53	0.00
28.09	59.65	2.00	0.00	0.52	0.00	28.14	63.96	2.00	0.00	0.52	0.00
28.19	70.69	2.00	0.00	0.52	0.00	28.26	77.23	2.00	0.00	0.52	0.00
28.32	83.11	2.00	0.00	0.52	0.00	28.39	87.19	2.00	0.00	0.52	0.00
28.43	89.66	2.00	0.00	0.52	0.00	28.48	90.27	2.00	0.00	0.52	0.00
28.56	88.85	2.00	0.00	0.52	0.00	28.65	86.10	2.00	0.00	0.51	0.00
28.71	82.14	2.00	0.00	0.51	0.00	28.79	79.08	2.00	0.00	0.51	0.00
28.83	77.27	2.00	0.00	0.51	0.00	28.89	78.19	2.00	0.00	0.51	0.00
28.97	79.68	2.00	0.00	0.51	0.00	29.02	81.00	2.00	0.00	0.51	0.00
29.12	81.07	2.00	0.00	0.51	0.00	29.15	80.35	2.00	0.00	0.51	0.00
29.21	77.93	2.00	0.00	0.50	0.00	29.28	75.10	2.00	0.00	0.50	0.00
29.34	72.86	2.00	0.00	0.50	0.00	29.45	72.74	2.00	0.00	0.50	0.00
29.49	73.60	2.00	0.00	0.50	0.00	29.55	72.56	2.00	0.00	0.50	0.00
29.61	67.80	2.00	0.00	0.50	0.00	29.66	59.85	2.00	0.00	0.50	0.00
29.76	51.55	2.00	0.00	0.50	0.00	29.83	46.70	2.00	0.00	0.49	0.00
29.88	45.01	2.00	0.00	0.49	0.00	29.93	46.65	2.00	0.00	0.49	0.00
30.02	50.46	2.00	0.00	0.49	0.00	30.09	54.04	2.00	0.00	0.49	0.00
30.14	55.53	2.00	0.00	0.49	0.00	30.19	54.78	2.00	0.00	0.49	0.00
30.26	53.32	2.00	0.00	0.49	0.00	30.32	50.49	2.00	0.00	0.49	0.00
30.43	47.58	2.00	0.00	0.48	0.00	30.50	45.09	2.00	0.00	0.48	0.00
30.63	44.58	2.00	0.00	0.48	0.00	30.68	42.82	2.00	0.00	0.48	0.00
30.74	40.89	2.00	0.00	0.48	0.00	30.81	39.57	2.00	0.00	0.48	0.00
30.86	42.70	2.00	0.00	0.48	0.00	30.93	46.75	2.00	0.00	0.48	0.00
31.05	49.82	2.00	0.00	0.47	0.00	31.07	51.31	2.00	0.00	0.47	0.00
31.18	51.65	2.00	0.00	0.47	0.00	31.23	51.98	2.00	0.00	0.47	0.00
31.27	51.99	2.00	0.00	0.47	0.00	31.31	51.34	2.00	0.00	0.47	0.00
31.40	49.86	2.00	0.00	0.47	0.00	31.49	48.26	2.00	0.00	0.47	0.00
31.54	47.27	2.00	0.00	0.47	0.00	31.58	47.07	2.00	0.00	0.46	0.00
31.67	46.90	2.00	0.00	0.46	0.00	31.73	46.73	2.00	0.00	0.46	0.00
31.77	46.81	2.00	0.00	0.46	0.00	31.85	47.11	2.00	0.00	0.46	0.00
31.91	47.80	2.00	0.00	0.46	0.00	31.98	48.60	2.00	0.00	0.46	0.00
32.07	49.38	2.00	0.00	0.46	0.00	32.10	50.16	2.00	0.00	0.46	0.00
32.16	50.12	2.00	0.00	0.45	0.00	32.33	49.50	2.00	0.00	0.45	0.00
32.37	48.16	2.00	0.00	0.45	0.00	32.43	47.76	2.00	0.00	0.45	0.00
32.50	48.25	2.00	0.00	0.45	0.00	32.55	49.91	2.00	0.00	0.45	0.00
32.62	51.73	2.00	0.00	0.45	0.00	32.73	52.73	2.00	0.00	0.45	0.00
32.79	53.04	2.00	0.00	0.44	0.00	32.86	52.74	2.00	0.00	0.44	0.00
32.96	53.17	2.00	0.00	0.44	0.00	33.03	54.87	2.00	0.00	0.44	0.00
33.08	57.71	2.00	0.00	0.44	0.00	33.14	61.88	2.00	0.00	0.44	0.00
33.21	65.89	2.00	0.00	0.44	0.00	33.26	70.16	2.00	0.00	0.44	0.00
33.32	74.70	2.00	0.00	0.44	0.00	33.39	78.48	2.00	0.00	0.43	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
33.44	81.96	2.00	0.00	0.43	0.00	33.52	83.95	2.00	0.00	0.43	0.00
33.56	86.06	2.00	0.00	0.43	0.00	33.63	87.38	2.00	0.00	0.43	0.00
33.70	88.47	2.00	0.00	0.43	0.00	33.75	89.44	2.00	0.00	0.43	0.00
33.82	89.89	2.00	0.00	0.43	0.00	33.91	89.94	2.00	0.00	0.43	0.00
33.96	89.86	2.00	0.00	0.42	0.00	34.00	90.34	2.00	0.00	0.42	0.00
34.11	91.84	2.00	0.00	0.42	0.00	34.15	93.72	2.00	0.00	0.42	0.00
34.21	94.29	2.00	0.00	0.42	0.00	34.26	96.20	2.00	0.00	0.42	0.00
34.35	97.88	0.25	0.99	0.42	0.01	34.40	100.28	0.26	0.97	0.42	0.01
34.45	101.63	0.27	0.96	0.42	0.01	34.52	104.26	0.28	0.94	0.41	0.01
34.62	106.33	0.29	0.92	0.41	0.01	34.71	107.78	0.29	0.90	0.41	0.01
34.75	109.36	0.30	0.89	0.41	0.00	34.81	111.58	0.31	0.88	0.41	0.01
34.88	113.97	0.33	0.86	0.41	0.01	34.93	114.92	0.33	0.85	0.41	0.01
35.02	114.53	0.33	0.85	0.41	0.01	35.10	114.15	0.33	0.85	0.41	0.01
35.15	114.71	0.33	0.84	0.40	0.00	35.19	116.42	0.34	0.83	0.40	0.00
35.26	117.98	0.35	0.82	0.40	0.01	35.32	119.27	0.36	0.81	0.40	0.01
35.41	119.74	0.36	0.81	0.40	0.01	35.47	120.21	0.36	0.80	0.40	0.01
35.54	120.64	0.36	0.80	0.40	0.01	35.59	121.15	0.37	0.79	0.40	0.00
35.74	120.89	0.36	0.79	0.39	0.01	35.81	119.71	0.36	0.79	0.39	0.01
35.85	117.61	0.35	0.80	0.39	0.00	35.92	115.99	0.34	0.81	0.39	0.01
35.99	114.31	0.33	0.82	0.39	0.01	36.04	113.53	0.32	0.82	0.39	0.01
36.11	112.54	0.32	0.82	0.39	0.01	36.16	112.24	0.32	0.82	0.39	0.01
36.21	109.59	0.30	0.84	0.39	0.00	36.29	106.34	0.29	0.86	0.38	0.01
36.35	102.89	0.27	0.88	0.38	0.01	36.41	102.11	0.27	0.88	0.38	0.01
36.52	101.25	0.26	0.88	0.38	0.01	36.59	98.73	0.25	0.90	0.38	0.01
36.60	96.87	0.25	0.91	0.38	0.00	36.62	96.13	0.24	0.92	0.38	0.00
36.70	97.18	0.25	0.90	0.38	0.01	36.77	98.17	0.25	0.89	0.38	0.01
36.84	99.31	0.25	0.88	0.38	0.01	36.92	100.56	0.26	0.87	0.37	0.01
36.96	101.07	0.26	0.87	0.37	0.00	37.02	100.07	0.26	0.87	0.37	0.01
37.10	98.62	0.25	0.88	0.37	0.01	37.14	97.15	0.25	0.89	0.37	0.00
37.23	96.58	0.24	0.89	0.37	0.01	37.29	97.17	0.25	0.88	0.37	0.01
37.37	98.34	0.25	0.87	0.37	0.01	37.43	99.50	0.26	0.86	0.37	0.01
37.48	100.09	0.26	0.85	0.36	0.00	37.58	100.20	0.26	0.85	0.36	0.01
37.62	100.06	0.26	0.85	0.36	0.00	37.67	98.98	0.25	0.85	0.36	0.00
37.77	97.42	0.25	0.86	0.36	0.01	37.83	95.56	0.24	0.87	0.36	0.01
37.89	93.83	0.23	0.88	0.36	0.01	37.93	91.32	0.22	0.90	0.36	0.00
38.03	88.81	0.22	0.92	0.36	0.01	38.08	86.60	0.21	0.93	0.35	0.01
38.14	85.51	0.21	0.94	0.35	0.01	38.24	84.83	0.20	0.94	0.35	0.01
38.29	85.09	0.20	0.94	0.35	0.00	38.33	85.83	0.21	0.93	0.35	0.01
38.39	87.82	0.21	0.91	0.35	0.01	38.51	90.12	0.22	0.88	0.35	0.01
38.57	93.11	0.23	0.86	0.35	0.01	38.64	95.32	0.24	0.84	0.35	0.01
38.69	96.83	0.24	0.83	0.34	0.01	38.77	92.01	0.23	0.86	0.34	0.01
38.87	87.22	0.21	0.89	0.34	0.01	38.94	75.13	0.18	1.00	0.34	0.01
38.99	74.95	0.18	1.00	0.34	0.01	39.07	85.81	0.21	0.89	0.34	0.01
39.13	87.77	0.21	0.88	0.34	0.01	39.18	83.88	0.20	0.91	0.34	0.01
39.20	87.50	0.21	0.88	0.34	0.00	39.27	91.88	0.23	0.84	0.33	0.01
39.34	96.16	2.00	0.00	0.33	0.00	39.37	99.45	2.00	0.00	0.33	0.00
39.46	102.20	2.00	0.00	0.33	0.00	39.51	104.20	2.00	0.00	0.33	0.00
39.59	103.74	2.00	0.00	0.33	0.00	39.64	101.83	2.00	0.00	0.33	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
39.73	99.45	2.00	0.00	0.33	0.00	39.77	95.84	2.00	0.00	0.33	0.00
39.84	92.77	2.00	0.00	0.32	0.00	39.93	90.52	2.00	0.00	0.32	0.00
39.98	90.65	2.00	0.00	0.32	0.00	40.03	93.70	2.00	0.00	0.32	0.00
40.11	98.59	2.00	0.00	0.32	0.00	40.16	106.45	0.29	0.71	0.32	0.00
40.25	113.85	0.32	0.67	0.32	0.01	40.30	120.50	0.36	0.64	0.32	0.00
40.37	124.27	0.39	0.62	0.32	0.00	40.42	126.11	0.40	0.61	0.31	0.00
40.51	123.85	0.38	0.61	0.31	0.01	40.59	119.41	2.00	0.00	0.31	0.00
40.69	112.21	2.00	0.00	0.31	0.00	40.78	106.97	2.00	0.00	0.31	0.00
40.82	103.51	2.00	0.00	0.31	0.00	40.89	102.72	0.27	0.70	0.31	0.01
40.95	102.56	0.27	0.70	0.31	0.01	41.02	103.43	0.27	0.69	0.30	0.01
41.08	104.67	0.28	0.68	0.30	0.01	41.12	105.99	0.28	0.67	0.30	0.00
41.19	106.54	0.29	0.67	0.30	0.00	41.26	107.10	0.29	0.66	0.30	0.01
41.32	108.41	0.30	0.66	0.30	0.00	41.38	110.39	0.31	0.64	0.30	0.00
41.43	112.29	0.32	0.63	0.30	0.00	41.49	113.51	0.32	0.62	0.30	0.00
41.57	114.15	0.33	0.62	0.30	0.01	41.62	115.31	0.33	0.61	0.29	0.00
41.70	112.39	0.32	0.62	0.29	0.01	41.75	107.98	0.29	0.64	0.29	0.00
41.82	104.14	0.28	0.66	0.29	0.01	41.88	105.26	0.28	0.65	0.29	0.00
42.00	107.99	2.00	0.00	0.29	0.00	42.05	110.00	2.00	0.00	0.29	0.00
42.14	111.84	0.31	0.61	0.29	0.01	42.17	113.59	0.32	0.60	0.29	0.00
42.20	113.72	0.32	0.60	0.28	0.00	42.28	111.86	0.31	0.60	0.28	0.01
42.37	109.59	2.00	0.00	0.28	0.00	42.40	106.65	2.00	0.00	0.28	0.00
42.48	103.66	2.00	0.00	0.28	0.00	42.53	99.71	2.00	0.00	0.28	0.00
42.62	96.46	2.00	0.00	0.28	0.00	42.67	94.34	2.00	0.00	0.28	0.00
42.72	93.49	2.00	0.00	0.28	0.00	42.79	93.97	2.00	0.00	0.27	0.00
42.89	95.23	2.00	0.00	0.27	0.00	42.93	96.55	2.00	0.00	0.27	0.00
43.03	96.53	2.00	0.00	0.27	0.00	43.08	94.87	2.00	0.00	0.27	0.00
43.14	91.67	2.00	0.00	0.27	0.00	43.19	86.93	2.00	0.00	0.27	0.00
43.28	81.91	2.00	0.00	0.27	0.00	43.34	76.59	2.00	0.00	0.27	0.00
43.38	70.64	2.00	0.00	0.26	0.00	43.51	65.61	2.00	0.00	0.26	0.00
43.55	62.82	2.00	0.00	0.26	0.00	43.59	63.90	2.00	0.00	0.26	0.00
43.70	64.82	2.00	0.00	0.26	0.00	43.73	65.73	2.00	0.00	0.26	0.00
43.80	66.69	2.00	0.00	0.26	0.00	43.85	68.25	2.00	0.00	0.26	0.00
43.90	70.87	2.00	0.00	0.26	0.00	44.00	73.50	2.00	0.00	0.25	0.00
44.05	76.53	2.00	0.00	0.25	0.00	44.12	78.79	2.00	0.00	0.25	0.00
44.17	81.29	2.00	0.00	0.25	0.00	44.25	83.84	2.00	0.00	0.25	0.00
44.31	86.40	2.00	0.00	0.25	0.00	44.38	88.39	2.00	0.00	0.25	0.00
44.43	89.91	2.00	0.00	0.25	0.00	44.53	89.38	2.00	0.00	0.25	0.00
44.61	87.01	2.00	0.00	0.24	0.00	44.65	83.95	2.00	0.00	0.24	0.00
44.73	82.82	2.00	0.00	0.24	0.00	44.84	83.77	2.00	0.00	0.24	0.00
44.92	84.99	2.00	0.00	0.24	0.00	44.96	85.39	2.00	0.00	0.24	0.00
45.02	84.95	2.00	0.00	0.24	0.00	45.11	84.40	2.00	0.00	0.24	0.00
45.16	84.57	2.00	0.00	0.23	0.00	45.25	85.29	2.00	0.00	0.23	0.00
45.29	86.47	2.00	0.00	0.23	0.00	45.38	87.60	2.00	0.00	0.23	0.00
45.42	89.89	2.00	0.00	0.23	0.00	45.51	92.38	2.00	0.00	0.23	0.00
45.55	95.42	2.00	0.00	0.23	0.00	45.61	97.73	2.00	0.00	0.23	0.00
45.71	99.47	2.00	0.00	0.23	0.00	45.78	100.56	2.00	0.00	0.22	0.00
45.82	101.49	2.00	0.00	0.22	0.00	45.91	102.33	2.00	0.00	0.22	0.00
45.96	103.17	2.00	0.00	0.22	0.00	46.01	104.14	2.00	0.00	0.22	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
46.08	105.08	2.00	0.00	0.22	0.00	46.17	105.82	2.00	0.00	0.22	0.00
46.21	105.92	2.00	0.00	0.22	0.00	46.26	104.68	2.00	0.00	0.22	0.00
46.37	102.33	2.00	0.00	0.21	0.00	46.42	99.95	2.00	0.00	0.21	0.00
46.48	98.95	2.00	0.00	0.21	0.00	46.54	99.17	2.00	0.00	0.21	0.00
46.61	98.09	2.00	0.00	0.21	0.00	46.66	96.24	2.00	0.00	0.21	0.00
46.72	93.88	2.00	0.00	0.21	0.00	46.79	91.79	2.00	0.00	0.21	0.00
46.91	89.36	2.00	0.00	0.20	0.00	46.97	83.32	2.00	0.00	0.20	0.00
47.02	78.25	2.00	0.00	0.20	0.00	47.10	73.18	2.00	0.00	0.20	0.00
47.15	72.59	2.00	0.00	0.20	0.00	47.23	71.51	2.00	0.00	0.20	0.00
47.33	70.93	2.00	0.00	0.20	0.00	47.36	71.11	2.00	0.00	0.20	0.00
47.39	72.78	2.00	0.00	0.20	0.00	47.51	74.64	2.00	0.00	0.19	0.00
47.62	76.03	2.00	0.00	0.19	0.00	47.69	76.83	2.00	0.00	0.19	0.00
47.74	84.58	2.00	0.00	0.19	0.00	47.80	100.33	2.00	0.00	0.19	0.00
47.87	114.62	2.00	0.00	0.19	0.00	47.92	122.96	0.39	0.37	0.19	0.00
48.01	125.74	0.41	0.36	0.19	0.00	48.10	126.46	0.41	0.36	0.18	0.00
48.15	126.31	0.41	0.35	0.18	0.00	48.21	126.54	0.41	0.35	0.18	0.00
48.26	126.83	0.41	0.35	0.18	0.00	48.31	126.99	0.42	0.35	0.18	0.00
48.36	126.96	0.42	0.35	0.18	0.00	48.44	126.39	0.41	0.35	0.18	0.00
48.55	125.88	0.41	0.34	0.18	0.00	48.63	125.41	0.41	0.34	0.18	0.00
48.67	125.75	0.41	0.34	0.18	0.00	48.74	126.51	0.41	0.33	0.17	0.00
48.80	128.18	0.43	0.33	0.17	0.00	48.92	129.37	0.43	0.32	0.17	0.00
48.98	129.82	0.44	0.32	0.17	0.00	49.04	129.06	0.43	0.32	0.17	0.00
49.11	128.00	0.43	0.32	0.17	0.00	49.17	127.14	0.42	0.32	0.17	0.00
49.23	126.57	0.42	0.32	0.17	0.00	49.28	126.34	0.41	0.32	0.16	0.00
49.34	126.18	0.41	0.32	0.16	0.00	49.41	125.25	0.41	0.32	0.16	0.00
49.46	123.50	0.40	0.32	0.16	0.00	49.52	122.04	0.39	0.32	0.16	0.00
49.59	122.14	0.39	0.32	0.16	0.00	49.64	124.78	0.40	0.31	0.16	0.00
49.77	126.68	0.42	0.30	0.16	0.00	49.86	128.60	0.43	0.29	0.15	0.00
49.91	128.83	0.43	0.29	0.15	0.00	49.95	129.99	0.44	0.29	0.15	0.00
50.03	130.38	0.45	0.29	0.15	0.00						

Total estimated settlement: 0.88

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

LANDMARK
Geo-Engineers and Geologists

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243

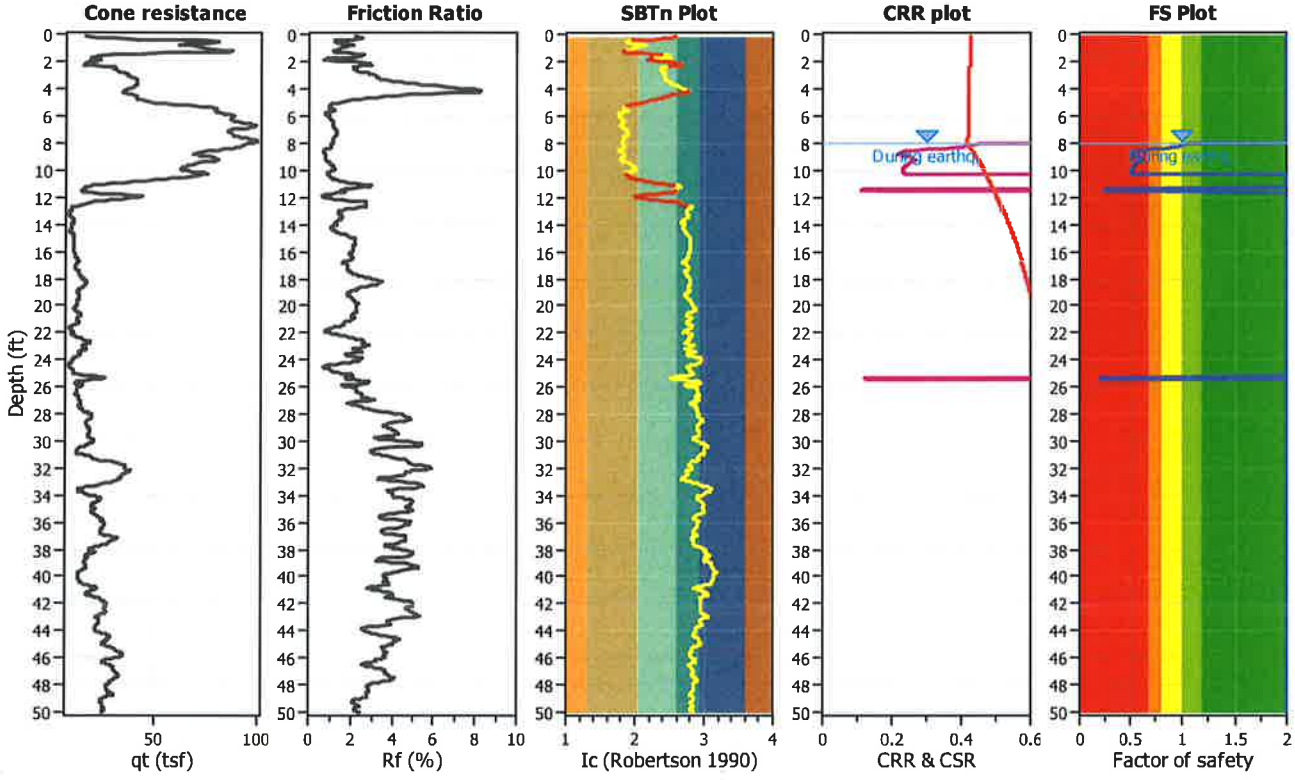
LIQUEFACTION ANALYSIS REPORT

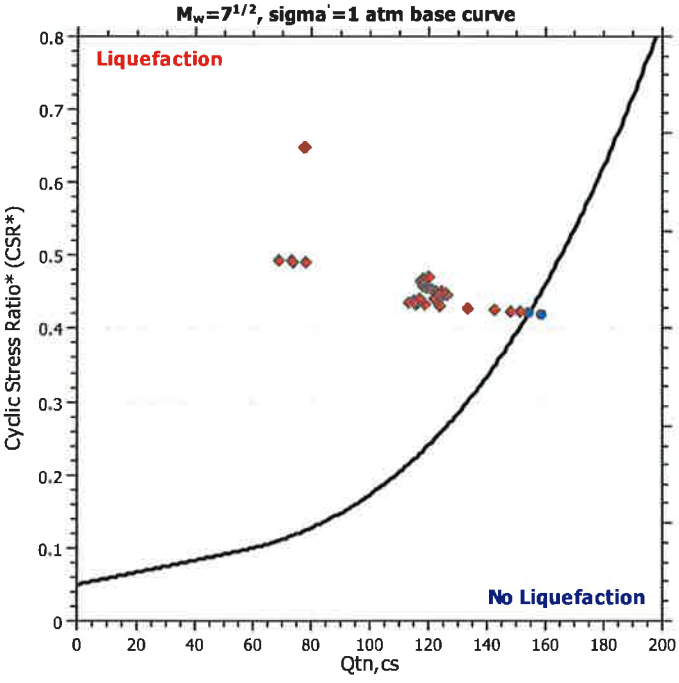
Project title : Heber Meadows Apartments **Location : Heber, CA**

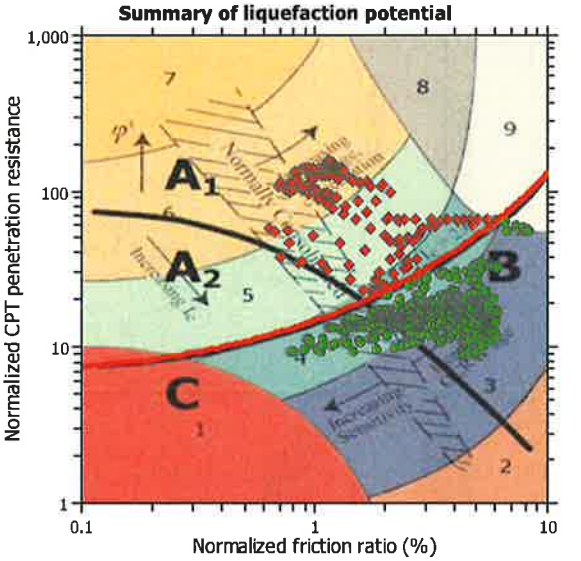
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	8.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	8.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude M_w:	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based

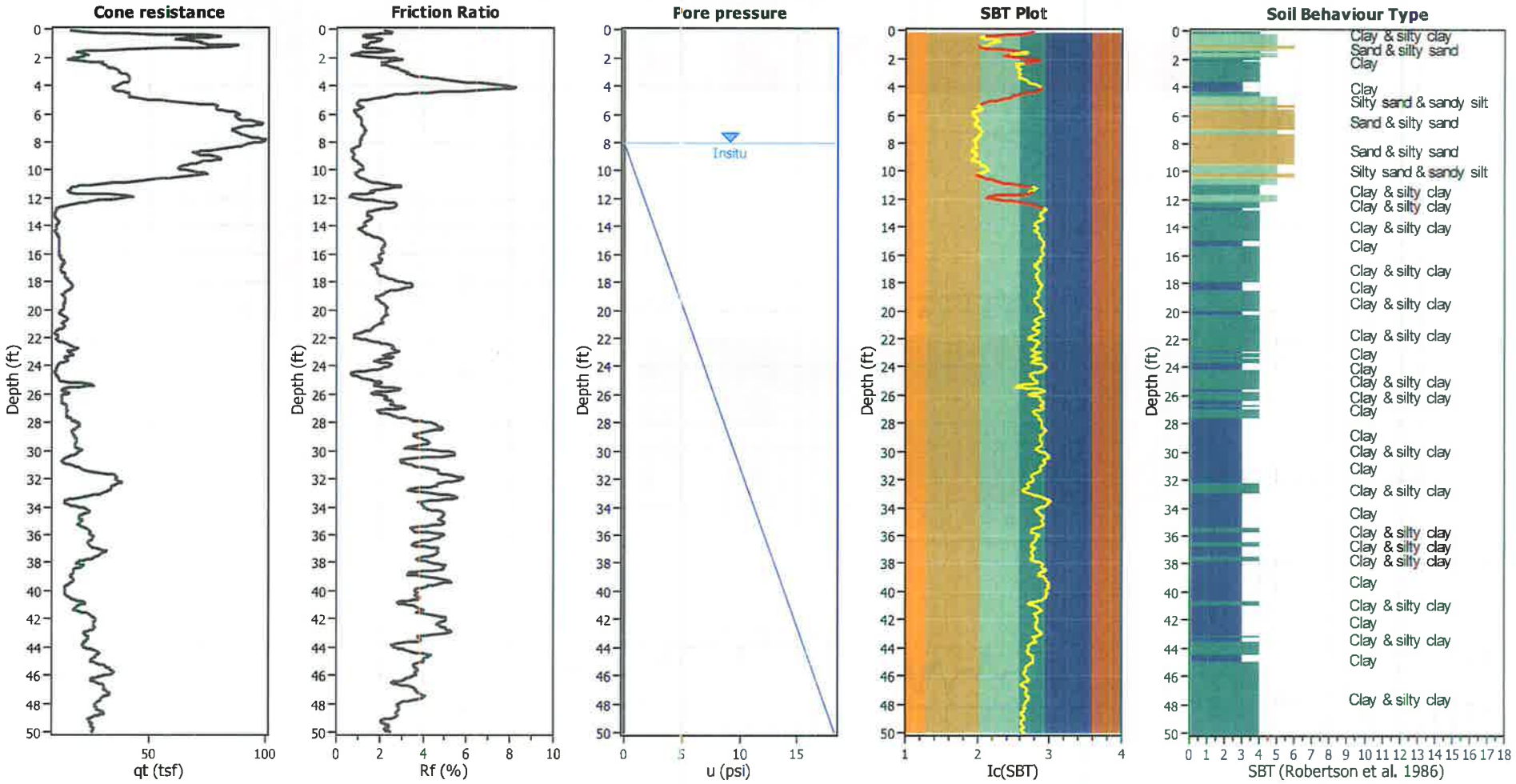






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



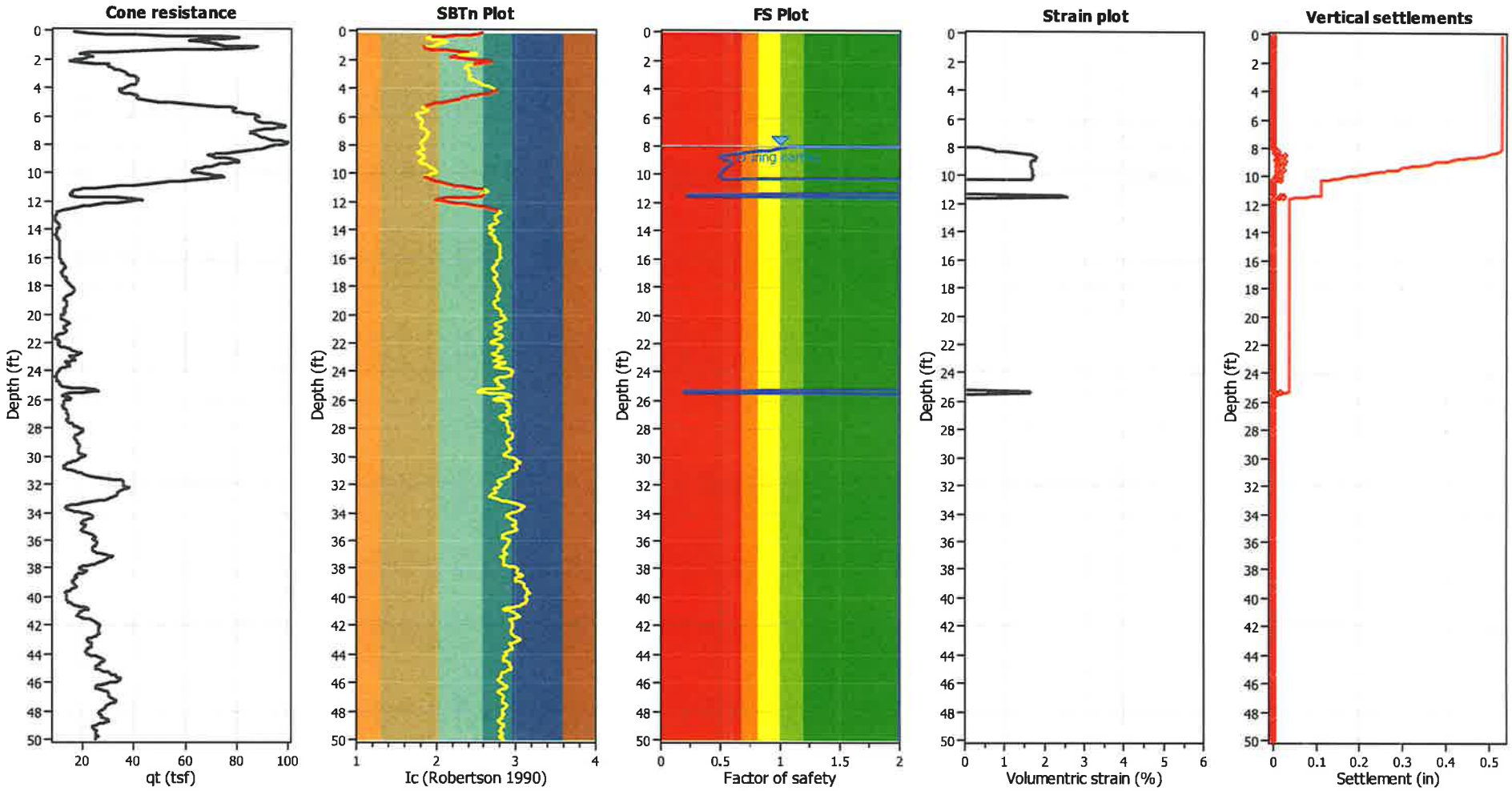
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	8.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
8.02	158.52	1.08	0.35	0.86	0.00	8.09	154.60	1.01	0.51	0.86	0.00
8.22	151.20	0.95	0.73	0.86	0.01	8.27	148.42	0.90	0.75	0.86	0.00
8.34	142.26	0.81	1.04	0.86	0.01	8.40	133.20	0.70	1.40	0.86	0.01
8.52	123.72	0.59	1.68	0.86	0.03	8.57	118.63	0.54	1.74	0.85	0.01
8.65	115.71	0.52	1.77	0.85	0.02	8.71	114.82	0.51	1.78	0.85	0.01
8.77	112.95	0.49	1.80	0.85	0.01	8.80	115.28	0.51	1.77	0.85	0.01
8.93	117.10	0.52	1.74	0.85	0.03	8.98	121.57	0.56	1.69	0.85	0.01
9.03	123.96	0.58	1.66	0.85	0.01	9.14	125.28	0.59	1.64	0.85	0.02
9.19	126.06	0.60	1.63	0.84	0.01	9.24	125.93	0.59	1.63	0.84	0.01
9.29	125.36	0.59	1.64	0.84	0.01	9.33	124.46	0.58	1.64	0.84	0.01
9.39	122.70	0.56	1.66	0.84	0.01	9.49	121.01	0.54	1.68	0.84	0.02
9.55	119.92	0.53	1.69	0.84	0.01	9.60	119.38	0.52	1.69	0.84	0.01
9.69	118.81	0.51	1.70	0.84	0.02	9.76	118.29	0.51	1.70	0.83	0.01
9.81	118.05	0.51	1.70	0.83	0.01	9.86	117.83	0.50	1.70	0.83	0.01
9.95	117.52	0.50	1.70	0.83	0.02	9.99	117.29	0.50	1.70	0.83	0.01
10.07	117.35	0.49	1.70	0.83	0.02	10.12	117.99	0.50	1.69	0.83	0.01
10.17	119.25	0.51	1.67	0.83	0.01	10.26	119.69	0.51	1.67	0.83	0.02
10.31	118.74	2.00	0.00	0.83	0.00	10.38	115.17	2.00	0.00	0.82	0.00
10.49	111.08	2.00	0.00	0.82	0.00	10.56	107.72	2.00	0.00	0.82	0.00
10.62	105.81	2.00	0.00	0.82	0.00	10.68	104.56	2.00	0.00	0.82	0.00
10.79	103.58	2.00	0.00	0.82	0.00	10.86	103.55	2.00	0.00	0.82	0.00
10.92	104.06	2.00	0.00	0.81	0.00	10.98	105.50	2.00	0.00	0.81	0.00
11.05	107.18	2.00	0.00	0.81	0.00	11.11	105.26	2.00	0.00	0.81	0.00
11.17	100.41	2.00	0.00	0.81	0.00	11.23	93.24	2.00	0.00	0.81	0.00
11.27	88.15	2.00	0.00	0.81	0.00	11.35	78.33	0.25	2.31	0.81	0.02
11.41	73.57	0.24	2.42	0.81	0.02	11.48	69.03	0.22	2.55	0.81	0.02
11.53	72.95	0.23	2.43	0.80	0.01	11.61	72.26	2.00	0.00	0.80	0.00
11.66	69.22	2.00	0.00	0.80	0.00	11.72	67.20	2.00	0.00	0.80	0.00
11.75	68.56	2.00	0.00	0.80	0.00	11.83	72.35	2.00	0.00	0.80	0.00
11.90	75.06	2.00	0.00	0.80	0.00	11.96	76.44	2.00	0.00	0.80	0.00
12.06	78.38	2.00	0.00	0.80	0.00	12.12	82.20	2.00	0.00	0.79	0.00
12.16	86.97	2.00	0.00	0.79	0.00	12.22	93.02	2.00	0.00	0.79	0.00
12.29	97.91	2.00	0.00	0.79	0.00	12.34	99.51	2.00	0.00	0.79	0.00
12.41	96.49	2.00	0.00	0.79	0.00	12.52	89.83	2.00	0.00	0.79	0.00
12.64	82.05	2.00	0.00	0.79	0.00	12.70	74.22	2.00	0.00	0.78	0.00
12.77	68.99	2.00	0.00	0.78	0.00	12.82	63.54	2.00	0.00	0.78	0.00
12.90	60.04	2.00	0.00	0.78	0.00	12.95	57.84	2.00	0.00	0.78	0.00
13.02	57.34	2.00	0.00	0.78	0.00	13.08	56.63	2.00	0.00	0.78	0.00
13.15	56.23	2.00	0.00	0.78	0.00	13.22	56.41	2.00	0.00	0.78	0.00
13.26	57.72	2.00	0.00	0.78	0.00	13.33	59.12	2.00	0.00	0.77	0.00
13.40	60.02	2.00	0.00	0.77	0.00	13.44	60.15	2.00	0.00	0.77	0.00
13.51	59.83	2.00	0.00	0.77	0.00	13.57	59.25	2.00	0.00	0.77	0.00
13.63	58.33	2.00	0.00	0.77	0.00	13.70	57.34	2.00	0.00	0.77	0.00
13.76	56.51	2.00	0.00	0.77	0.00	13.83	56.12	2.00	0.00	0.77	0.00
13.88	56.03	2.00	0.00	0.76	0.00	13.94	56.09	2.00	0.00	0.76	0.00
14.01	55.21	2.00	0.00	0.76	0.00	14.09	53.34	2.00	0.00	0.76	0.00
14.14	50.96	2.00	0.00	0.76	0.00	14.20	50.25	2.00	0.00	0.76	0.00
14.28	50.60	2.00	0.00	0.76	0.00	14.33	51.61	2.00	0.00	0.76	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
14.41	52.42	2.00	0.00	0.76	0.00	14.45	53.64	2.00	0.00	0.76	0.00
14.53	55.15	2.00	0.00	0.75	0.00	14.59	56.58	2.00	0.00	0.75	0.00
14.64	58.78	2.00	0.00	0.75	0.00	14.72	61.01	2.00	0.00	0.75	0.00
14.77	63.62	2.00	0.00	0.75	0.00	14.83	66.07	2.00	0.00	0.75	0.00
14.94	68.30	2.00	0.00	0.75	0.00	14.99	69.95	2.00	0.00	0.75	0.00
15.03	70.84	2.00	0.00	0.75	0.00	15.18	71.28	2.00	0.00	0.74	0.00
15.25	71.40	2.00	0.00	0.74	0.00	15.38	71.11	2.00	0.00	0.74	0.00
15.43	70.85	2.00	0.00	0.74	0.00	15.48	70.65	2.00	0.00	0.74	0.00
15.56	70.42	2.00	0.00	0.74	0.00	15.61	69.82	2.00	0.00	0.74	0.00
15.67	69.61	2.00	0.00	0.73	0.00	15.74	69.36	2.00	0.00	0.73	0.00
15.79	69.67	2.00	0.00	0.73	0.00	15.86	69.63	2.00	0.00	0.73	0.00
15.92	69.58	2.00	0.00	0.73	0.00	15.97	69.01	2.00	0.00	0.73	0.00
16.05	68.26	2.00	0.00	0.73	0.00	16.10	67.69	2.00	0.00	0.73	0.00
16.17	67.45	2.00	0.00	0.73	0.00	16.23	67.92	2.00	0.00	0.73	0.00
16.29	69.00	2.00	0.00	0.72	0.00	16.35	69.95	2.00	0.00	0.72	0.00
16.41	70.93	2.00	0.00	0.72	0.00	16.49	71.26	2.00	0.00	0.72	0.00
16.62	71.48	2.00	0.00	0.72	0.00	16.66	67.99	2.00	0.00	0.72	0.00
16.72	65.58	2.00	0.00	0.72	0.00	16.79	63.82	2.00	0.00	0.72	0.00
16.84	65.53	2.00	0.00	0.71	0.00	16.92	66.17	2.00	0.00	0.71	0.00
16.97	66.31	2.00	0.00	0.71	0.00	17.03	66.29	2.00	0.00	0.71	0.00
17.08	66.35	2.00	0.00	0.71	0.00	17.17	66.40	2.00	0.00	0.71	0.00
17.25	67.11	2.00	0.00	0.71	0.00	17.33	67.82	2.00	0.00	0.71	0.00
17.37	68.71	2.00	0.00	0.71	0.00	17.42	69.51	2.00	0.00	0.70	0.00
17.46	70.08	2.00	0.00	0.70	0.00	17.52	71.60	2.00	0.00	0.70	0.00
17.59	73.38	2.00	0.00	0.70	0.00	17.70	76.47	2.00	0.00	0.70	0.00
17.77	78.98	2.00	0.00	0.70	0.00	17.82	82.10	2.00	0.00	0.70	0.00
17.89	84.71	2.00	0.00	0.70	0.00	17.94	87.99	2.00	0.00	0.70	0.00
18.01	91.37	2.00	0.00	0.69	0.00	18.08	94.77	2.00	0.00	0.69	0.00
18.13	98.27	2.00	0.00	0.69	0.00	18.20	100.14	2.00	0.00	0.69	0.00
18.26	100.48	2.00	0.00	0.69	0.00	18.38	98.68	2.00	0.00	0.69	0.00
18.44	95.74	2.00	0.00	0.69	0.00	18.49	91.17	2.00	0.00	0.69	0.00
18.56	86.16	2.00	0.00	0.69	0.00	18.61	81.09	2.00	0.00	0.68	0.00
18.69	77.92	2.00	0.00	0.68	0.00	18.74	75.50	2.00	0.00	0.68	0.00
18.80	73.86	2.00	0.00	0.68	0.00	18.87	71.94	2.00	0.00	0.68	0.00
18.92	69.62	2.00	0.00	0.68	0.00	19.00	67.64	2.00	0.00	0.68	0.00
19.04	66.66	2.00	0.00	0.68	0.00	19.11	67.12	2.00	0.00	0.68	0.00
19.18	67.96	2.00	0.00	0.67	0.00	19.24	68.77	2.00	0.00	0.67	0.00
19.30	69.69	2.00	0.00	0.67	0.00	19.40	70.51	2.00	0.00	0.67	0.00
19.49	71.20	2.00	0.00	0.67	0.00	19.54	71.23	2.00	0.00	0.67	0.00
19.61	71.64	2.00	0.00	0.67	0.00	19.66	72.49	2.00	0.00	0.67	0.00
19.74	73.39	2.00	0.00	0.67	0.00	19.80	73.79	2.00	0.00	0.66	0.00
19.82	73.41	2.00	0.00	0.66	0.00	19.91	72.71	2.00	0.00	0.66	0.00
20.00	71.89	2.00	0.00	0.66	0.00	20.04	70.84	2.00	0.00	0.66	0.00
20.09	69.90	2.00	0.00	0.66	0.00	20.15	69.58	2.00	0.00	0.66	0.00
20.25	69.81	2.00	0.00	0.66	0.00	20.30	70.27	2.00	0.00	0.66	0.00
20.35	71.18	2.00	0.00	0.66	0.00	20.45	72.07	2.00	0.00	0.65	0.00
20.52	72.86	2.00	0.00	0.65	0.00	20.57	72.96	2.00	0.00	0.65	0.00
20.62	72.61	2.00	0.00	0.65	0.00	20.70	71.93	2.00	0.00	0.65	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.75	71.26	2.00	0.00	0.65	0.00	20.83	71.04	2.00	0.00	0.65	0.00
20.88	70.47	2.00	0.00	0.65	0.00	20.94	69.52	2.00	0.00	0.65	0.00
21.01	68.04	2.00	0.00	0.64	0.00	21.11	66.79	2.00	0.00	0.64	0.00
21.18	65.55	2.00	0.00	0.64	0.00	21.23	63.34	2.00	0.00	0.64	0.00
21.36	60.88	2.00	0.00	0.64	0.00	21.43	58.51	2.00	0.00	0.64	0.00
21.49	56.16	2.00	0.00	0.64	0.00	21.54	53.15	2.00	0.00	0.63	0.00
21.60	50.05	2.00	0.00	0.63	0.00	21.67	46.66	2.00	0.00	0.63	0.00
21.73	45.17	2.00	0.00	0.63	0.00	21.80	43.81	2.00	0.00	0.63	0.00
21.85	44.42	2.00	0.00	0.63	0.00	21.91	44.40	2.00	0.00	0.63	0.00
21.98	44.88	2.00	0.00	0.63	0.00	22.01	46.93	2.00	0.00	0.63	0.00
22.09	50.03	2.00	0.00	0.63	0.00	22.13	53.01	2.00	0.00	0.62	0.00
22.21	57.00	2.00	0.00	0.62	0.00	22.28	62.01	2.00	0.00	0.62	0.00
22.33	66.86	2.00	0.00	0.62	0.00	22.39	71.34	2.00	0.00	0.62	0.00
22.46	75.24	2.00	0.00	0.62	0.00	22.51	80.46	2.00	0.00	0.62	0.00
22.59	84.01	2.00	0.00	0.62	0.00	22.69	86.15	2.00	0.00	0.62	0.00
22.77	86.57	2.00	0.00	0.61	0.00	22.81	86.36	2.00	0.00	0.61	0.00
22.89	85.55	2.00	0.00	0.61	0.00	22.95	84.28	2.00	0.00	0.61	0.00
22.99	81.30	2.00	0.00	0.61	0.00	23.12	78.51	2.00	0.00	0.61	0.00
23.19	75.88	2.00	0.00	0.61	0.00	23.25	76.04	2.00	0.00	0.61	0.00
23.30	75.58	2.00	0.00	0.61	0.00	23.37	75.94	2.00	0.00	0.60	0.00
23.43	74.87	2.00	0.00	0.60	0.00	23.48	72.07	2.00	0.00	0.60	0.00
23.56	68.18	2.00	0.00	0.60	0.00	23.61	65.20	2.00	0.00	0.60	0.00
23.67	65.84	2.00	0.00	0.60	0.00	23.74	67.26	2.00	0.00	0.60	0.00
23.79	68.96	2.00	0.00	0.60	0.00	23.86	69.67	2.00	0.00	0.60	0.00
23.92	68.22	2.00	0.00	0.59	0.00	24.05	65.98	2.00	0.00	0.59	0.00
24.09	63.61	2.00	0.00	0.59	0.00	24.16	61.71	2.00	0.00	0.59	0.00
24.23	58.88	2.00	0.00	0.59	0.00	24.28	54.57	2.00	0.00	0.59	0.00
24.36	49.64	2.00	0.00	0.59	0.00	24.40	44.16	2.00	0.00	0.59	0.00
24.47	40.33	2.00	0.00	0.59	0.00	24.53	40.04	2.00	0.00	0.58	0.00
24.64	41.95	2.00	0.00	0.58	0.00	24.67	43.81	2.00	0.00	0.58	0.00
24.69	45.51	2.00	0.00	0.58	0.00	24.80	48.03	2.00	0.00	0.58	0.00
24.87	50.76	2.00	0.00	0.58	0.00	24.92	53.71	2.00	0.00	0.58	0.00
24.99	57.48	2.00	0.00	0.58	0.00	25.05	61.33	2.00	0.00	0.58	0.00
25.11	66.65	2.00	0.00	0.57	0.00	25.18	71.88	2.00	0.00	0.57	0.00
25.22	75.98	2.00	0.00	0.57	0.00	25.30	77.53	0.19	1.64	0.57	0.02
25.36	77.92	0.19	1.63	0.57	0.01	25.40	77.96	0.19	1.63	0.57	0.01
25.49	78.82	2.00	0.00	0.57	0.00	25.53	79.02	2.00	0.00	0.57	0.00
25.59	77.65	2.00	0.00	0.57	0.00	25.67	73.75	2.00	0.00	0.56	0.00
25.79	68.90	2.00	0.00	0.56	0.00	25.84	64.77	2.00	0.00	0.56	0.00
25.90	63.10	2.00	0.00	0.56	0.00	25.97	63.92	2.00	0.00	0.56	0.00
26.03	66.20	2.00	0.00	0.56	0.00	26.15	68.02	2.00	0.00	0.56	0.00
26.20	68.39	2.00	0.00	0.56	0.00	26.28	67.90	2.00	0.00	0.55	0.00
26.33	67.79	2.00	0.00	0.55	0.00	26.38	69.02	2.00	0.00	0.55	0.00
26.46	70.37	2.00	0.00	0.55	0.00	26.59	71.51	2.00	0.00	0.55	0.00
26.64	72.17	2.00	0.00	0.55	0.00	26.70	73.25	2.00	0.00	0.55	0.00
26.77	74.66	2.00	0.00	0.55	0.00	26.81	77.18	2.00	0.00	0.55	0.00
26.89	79.71	2.00	0.00	0.54	0.00	26.95	81.29	2.00	0.00	0.54	0.00
27.01	77.68	2.00	0.00	0.54	0.00	27.07	71.65	2.00	0.00	0.54	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
27.12	66.25	2.00	0.00	0.54	0.00	27.18	65.55	2.00	0.00	0.54	0.00
27.25	66.56	2.00	0.00	0.54	0.00	27.31	68.23	2.00	0.00	0.54	0.00
27.38	70.41	2.00	0.00	0.54	0.00	27.44	73.53	2.00	0.00	0.53	0.00
27.53	75.27	2.00	0.00	0.53	0.00	27.59	77.23	2.00	0.00	0.53	0.00
27.65	79.24	2.00	0.00	0.53	0.00	27.70	85.47	2.00	0.00	0.53	0.00
27.83	91.71	2.00	0.00	0.53	0.00	27.88	98.29	2.00	0.00	0.53	0.00
27.94	102.56	2.00	0.00	0.53	0.00	28.00	106.42	2.00	0.00	0.53	0.00
28.05	109.40	2.00	0.00	0.52	0.00	28.10	111.91	2.00	0.00	0.52	0.00
28.27	113.10	2.00	0.00	0.52	0.00	28.32	113.24	2.00	0.00	0.52	0.00
28.37	111.31	2.00	0.00	0.52	0.00	28.45	108.28	2.00	0.00	0.52	0.00
28.50	104.30	2.00	0.00	0.52	0.00	28.58	99.56	2.00	0.00	0.52	0.00
28.68	95.35	2.00	0.00	0.51	0.00	28.75	92.98	2.00	0.00	0.51	0.00
28.80	92.42	2.00	0.00	0.51	0.00	28.85	92.64	2.00	0.00	0.51	0.00
28.93	93.14	2.00	0.00	0.51	0.00	28.99	94.93	2.00	0.00	0.51	0.00
29.06	97.16	2.00	0.00	0.51	0.00	29.11	99.12	2.00	0.00	0.51	0.00
29.17	100.66	2.00	0.00	0.51	0.00	29.24	101.69	2.00	0.00	0.50	0.00
29.29	102.68	2.00	0.00	0.50	0.00	29.37	102.73	2.00	0.00	0.50	0.00
29.42	102.38	2.00	0.00	0.50	0.00	29.48	101.02	2.00	0.00	0.50	0.00
29.55	99.43	2.00	0.00	0.50	0.00	29.60	95.88	2.00	0.00	0.50	0.00
29.73	90.00	2.00	0.00	0.50	0.00	29.78	89.17	2.00	0.00	0.50	0.00
29.86	93.66	2.00	0.00	0.49	0.00	29.91	102.81	2.00	0.00	0.49	0.00
29.96	109.44	2.00	0.00	0.49	0.00	30.04	113.92	2.00	0.00	0.49	0.00
30.08	116.24	2.00	0.00	0.49	0.00	30.13	115.91	2.00	0.00	0.49	0.00
30.26	113.82	2.00	0.00	0.49	0.00	30.32	110.22	2.00	0.00	0.49	0.00
30.37	105.40	2.00	0.00	0.49	0.00	30.41	99.15	2.00	0.00	0.48	0.00
30.45	89.84	2.00	0.00	0.48	0.00	30.58	81.04	2.00	0.00	0.48	0.00
30.63	74.52	2.00	0.00	0.48	0.00	30.69	73.39	2.00	0.00	0.48	0.00
30.76	73.00	2.00	0.00	0.48	0.00	30.81	74.07	2.00	0.00	0.48	0.00
30.89	76.19	2.00	0.00	0.48	0.00	30.94	79.83	2.00	0.00	0.48	0.00
31.00	84.54	2.00	0.00	0.47	0.00	31.07	89.61	2.00	0.00	0.47	0.00
31.12	94.99	2.00	0.00	0.47	0.00	31.19	100.61	2.00	0.00	0.47	0.00
31.30	106.04	2.00	0.00	0.47	0.00	31.38	112.76	2.00	0.00	0.47	0.00
31.49	119.12	2.00	0.00	0.47	0.00	31.55	127.97	2.00	0.00	0.47	0.00
31.66	136.78	2.00	0.00	0.46	0.00	31.73	145.00	2.00	0.00	0.46	0.00
31.78	151.08	2.00	0.00	0.46	0.00	31.85	154.83	2.00	0.00	0.46	0.00
31.91	156.92	2.00	0.00	0.46	0.00	31.97	157.20	2.00	0.00	0.46	0.00
32.03	156.13	2.00	0.00	0.46	0.00	32.09	154.00	2.00	0.00	0.46	0.00
32.17	151.05	2.00	0.00	0.45	0.00	32.22	147.58	2.00	0.00	0.45	0.00
32.27	143.66	2.00	0.00	0.45	0.00	32.34	140.09	2.00	0.00	0.45	0.00
32.39	137.08	2.00	0.00	0.45	0.00	32.46	134.79	2.00	0.00	0.45	0.00
32.52	132.31	2.00	0.00	0.45	0.00	32.57	128.36	2.00	0.00	0.45	0.00
32.65	121.17	2.00	0.00	0.45	0.00	32.70	113.56	2.00	0.00	0.45	0.00
32.77	110.76	2.00	0.00	0.44	0.00	32.83	110.69	2.00	0.00	0.44	0.00
32.88	114.98	2.00	0.00	0.44	0.00	32.96	117.88	2.00	0.00	0.44	0.00
33.01	123.55	2.00	0.00	0.44	0.00	33.10	126.08	2.00	0.00	0.44	0.00
33.15	126.17	2.00	0.00	0.44	0.00	33.23	123.05	2.00	0.00	0.44	0.00
33.30	115.67	2.00	0.00	0.44	0.00	33.40	106.53	2.00	0.00	0.43	0.00
33.45	97.56	2.00	0.00	0.43	0.00	33.49	91.45	2.00	0.00	0.43	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
33.53	85.74	2.00	0.00	0.43	0.00	33.63	81.63	2.00	0.00	0.43	0.00
33.67	80.13	2.00	0.00	0.43	0.00	33.76	81.80	2.00	0.00	0.43	0.00
33.81	86.65	2.00	0.00	0.43	0.00	33.94	91.16	2.00	0.00	0.42	0.00
33.99	95.77	2.00	0.00	0.42	0.00	34.04	98.22	2.00	0.00	0.42	0.00
34.07	101.69	2.00	0.00	0.42	0.00	34.15	105.32	2.00	0.00	0.42	0.00
34.20	110.95	2.00	0.00	0.42	0.00	34.29	114.50	2.00	0.00	0.42	0.00
34.35	116.58	2.00	0.00	0.42	0.00	34.41	115.61	2.00	0.00	0.42	0.00
34.46	113.03	2.00	0.00	0.42	0.00	34.55	110.41	2.00	0.00	0.41	0.00
34.60	108.05	2.00	0.00	0.41	0.00	34.65	106.71	2.00	0.00	0.41	0.00
34.75	105.21	2.00	0.00	0.41	0.00	34.82	104.50	2.00	0.00	0.41	0.00
34.86	105.07	2.00	0.00	0.41	0.00	34.91	106.87	2.00	0.00	0.41	0.00
34.98	108.48	2.00	0.00	0.41	0.00	35.10	108.55	2.00	0.00	0.41	0.00
35.17	106.74	2.00	0.00	0.40	0.00	35.24	103.62	2.00	0.00	0.40	0.00
35.31	100.61	2.00	0.00	0.40	0.00	35.36	97.73	2.00	0.00	0.40	0.00
35.44	95.92	2.00	0.00	0.40	0.00	35.50	93.53	2.00	0.00	0.40	0.00
35.62	96.50	2.00	0.00	0.40	0.00	35.75	101.08	2.00	0.00	0.39	0.00
35.81	108.50	2.00	0.00	0.39	0.00	35.88	112.74	2.00	0.00	0.39	0.00
35.92	115.44	2.00	0.00	0.39	0.00	35.97	116.66	2.00	0.00	0.39	0.00
36.07	116.76	2.00	0.00	0.39	0.00	36.14	116.58	2.00	0.00	0.39	0.00
36.18	116.07	2.00	0.00	0.39	0.00	36.25	114.84	2.00	0.00	0.39	0.00
36.29	111.45	2.00	0.00	0.38	0.00	36.40	107.39	2.00	0.00	0.38	0.00
36.45	103.13	2.00	0.00	0.38	0.00	36.49	99.70	2.00	0.00	0.38	0.00
36.62	96.57	2.00	0.00	0.38	0.00	36.73	96.31	2.00	0.00	0.38	0.00
36.80	99.60	2.00	0.00	0.38	0.00	36.85	105.64	2.00	0.00	0.38	0.00
36.92	111.28	2.00	0.00	0.37	0.00	36.97	116.41	2.00	0.00	0.37	0.00
37.03	120.16	2.00	0.00	0.37	0.00	37.11	122.79	2.00	0.00	0.37	0.00
37.15	124.33	2.00	0.00	0.37	0.00	37.22	124.32	2.00	0.00	0.37	0.00
37.28	122.71	2.00	0.00	0.37	0.00	37.34	119.96	2.00	0.00	0.37	0.00
37.41	116.33	2.00	0.00	0.37	0.00	37.52	111.68	2.00	0.00	0.36	0.00
37.59	107.17	2.00	0.00	0.36	0.00	37.64	102.74	2.00	0.00	0.36	0.00
37.70	99.43	2.00	0.00	0.36	0.00	37.77	96.67	2.00	0.00	0.36	0.00
37.83	95.03	2.00	0.00	0.36	0.00	37.90	94.45	2.00	0.00	0.36	0.00
37.95	94.76	2.00	0.00	0.36	0.00	38.02	96.68	2.00	0.00	0.36	0.00
38.08	100.12	2.00	0.00	0.35	0.00	38.14	104.75	2.00	0.00	0.35	0.00
38.21	107.90	2.00	0.00	0.35	0.00	38.26	106.34	2.00	0.00	0.35	0.00
38.33	103.24	2.00	0.00	0.35	0.00	38.39	98.63	2.00	0.00	0.35	0.00
38.52	96.27	2.00	0.00	0.35	0.00	38.56	91.87	2.00	0.00	0.35	0.00
38.62	87.79	2.00	0.00	0.35	0.00	38.65	83.66	2.00	0.00	0.34	0.00
38.72	80.58	2.00	0.00	0.34	0.00	38.84	78.69	2.00	0.00	0.34	0.00
38.88	78.32	2.00	0.00	0.34	0.00	38.92	80.95	2.00	0.00	0.34	0.00
39.01	84.60	2.00	0.00	0.34	0.00	39.05	90.98	2.00	0.00	0.34	0.00
39.20	95.54	2.00	0.00	0.34	0.00	39.27	98.48	2.00	0.00	0.33	0.00
39.36	96.95	2.00	0.00	0.33	0.00	39.45	91.80	2.00	0.00	0.33	0.00
39.56	85.45	2.00	0.00	0.33	0.00	39.62	80.19	2.00	0.00	0.33	0.00
39.67	78.57	2.00	0.00	0.33	0.00	39.72	77.67	2.00	0.00	0.33	0.00
39.80	76.58	2.00	0.00	0.33	0.00	39.85	75.10	2.00	0.00	0.32	0.00
39.93	74.18	2.00	0.00	0.32	0.00	39.98	74.10	2.00	0.00	0.32	0.00
40.11	74.59	2.00	0.00	0.32	0.00	40.17	75.18	2.00	0.00	0.32	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
40.23	75.26	2.00	0.00	0.32	0.00	40.29	75.18	2.00	0.00	0.32	0.00
40.36	75.94	2.00	0.00	0.32	0.00	40.42	77.44	2.00	0.00	0.31	0.00
40.47	79.78	2.00	0.00	0.31	0.00	40.55	81.62	2.00	0.00	0.31	0.00
40.59	83.02	2.00	0.00	0.31	0.00	40.66	83.32	2.00	0.00	0.31	0.00
40.73	82.89	2.00	0.00	0.31	0.00	40.78	82.31	2.00	0.00	0.31	0.00
40.85	82.09	2.00	0.00	0.31	0.00	40.90	82.54	2.00	0.00	0.31	0.00
40.95	83.37	2.00	0.00	0.31	0.00	41.03	84.11	2.00	0.00	0.30	0.00
41.08	84.85	2.00	0.00	0.30	0.00	41.16	85.30	2.00	0.00	0.30	0.00
41.21	85.64	2.00	0.00	0.30	0.00	41.34	86.12	2.00	0.00	0.30	0.00
41.39	87.23	2.00	0.00	0.30	0.00	41.47	88.50	2.00	0.00	0.30	0.00
41.56	89.97	2.00	0.00	0.30	0.00	41.61	94.32	2.00	0.00	0.29	0.00
41.69	100.89	2.00	0.00	0.29	0.00	41.78	107.25	2.00	0.00	0.29	0.00
41.82	111.47	2.00	0.00	0.29	0.00	41.91	113.18	2.00	0.00	0.29	0.00
41.96	114.11	2.00	0.00	0.29	0.00	42.00	114.21	2.00	0.00	0.29	0.00
42.10	114.11	2.00	0.00	0.29	0.00	42.17	113.39	2.00	0.00	0.29	0.00
42.22	112.11	2.00	0.00	0.28	0.00	42.28	110.35	2.00	0.00	0.28	0.00
42.35	109.11	2.00	0.00	0.28	0.00	42.40	109.43	2.00	0.00	0.28	0.00
42.53	110.71	2.00	0.00	0.28	0.00	42.57	112.37	2.00	0.00	0.28	0.00
42.64	112.91	2.00	0.00	0.28	0.00	42.70	112.63	2.00	0.00	0.28	0.00
42.75	111.85	2.00	0.00	0.28	0.00	42.80	110.87	2.00	0.00	0.27	0.00
42.88	109.45	2.00	0.00	0.27	0.00	42.93	107.43	2.00	0.00	0.27	0.00
42.98	103.89	2.00	0.00	0.27	0.00	43.06	99.29	2.00	0.00	0.27	0.00
43.17	95.12	2.00	0.00	0.27	0.00	43.24	93.17	2.00	0.00	0.27	0.00
43.29	93.28	2.00	0.00	0.27	0.00	43.36	93.71	2.00	0.00	0.27	0.00
43.41	94.08	2.00	0.00	0.26	0.00	43.47	94.12	2.00	0.00	0.26	0.00
43.54	93.41	2.00	0.00	0.26	0.00	43.59	91.46	2.00	0.00	0.26	0.00
43.67	84.64	2.00	0.00	0.26	0.00	43.72	79.28	2.00	0.00	0.26	0.00
43.85	74.90	2.00	0.00	0.26	0.00	43.90	76.61	2.00	0.00	0.26	0.00
44.03	77.12	2.00	0.00	0.25	0.00	44.05	79.55	2.00	0.00	0.25	0.00
44.13	82.34	2.00	0.00	0.25	0.00	44.18	87.28	2.00	0.00	0.25	0.00
44.26	91.36	2.00	0.00	0.25	0.00	44.31	96.52	2.00	0.00	0.25	0.00
44.40	100.18	2.00	0.00	0.25	0.00	44.44	103.81	2.00	0.00	0.25	0.00
44.53	105.30	2.00	0.00	0.25	0.00	44.58	105.67	2.00	0.00	0.24	0.00
44.64	104.32	2.00	0.00	0.24	0.00	44.73	102.47	2.00	0.00	0.24	0.00
44.78	100.08	2.00	0.00	0.24	0.00	44.88	98.27	2.00	0.00	0.24	0.00
44.93	97.18	2.00	0.00	0.24	0.00	44.97	97.19	2.00	0.00	0.24	0.00
45.03	97.49	2.00	0.00	0.24	0.00	45.08	97.62	2.00	0.00	0.24	0.00
45.19	97.49	2.00	0.00	0.23	0.00	45.23	97.47	2.00	0.00	0.23	0.00
45.28	99.71	2.00	0.00	0.23	0.00	45.45	102.21	2.00	0.00	0.23	0.00
45.51	105.09	2.00	0.00	0.23	0.00	45.59	106.17	2.00	0.00	0.23	0.00
45.63	107.09	2.00	0.00	0.23	0.00	45.70	107.53	2.00	0.00	0.23	0.00
45.76	107.44	2.00	0.00	0.22	0.00	45.81	106.81	2.00	0.00	0.22	0.00
45.89	105.71	2.00	0.00	0.22	0.00	45.94	104.28	2.00	0.00	0.22	0.00
46.01	100.91	2.00	0.00	0.22	0.00	46.12	96.31	2.00	0.00	0.22	0.00
46.18	90.58	2.00	0.00	0.22	0.00	46.25	88.13	2.00	0.00	0.22	0.00
46.30	86.16	2.00	0.00	0.22	0.00	46.38	84.17	2.00	0.00	0.21	0.00
46.42	81.54	2.00	0.00	0.21	0.00	46.49	81.55	2.00	0.00	0.21	0.00
46.56	84.73	2.00	0.00	0.21	0.00	46.62	88.28	2.00	0.00	0.21	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
46.66	91.79	2.00	0.00	0.21	0.00	46.74	95.01	2.00	0.00	0.21	0.00
46.80	97.71	2.00	0.00	0.21	0.00	46.89	99.32	2.00	0.00	0.21	0.00
46.97	100.15	2.00	0.00	0.20	0.00	47.03	100.99	2.00	0.00	0.20	0.00
47.09	101.84	2.00	0.00	0.20	0.00	47.14	102.89	2.00	0.00	0.20	0.00
47.20	104.07	2.00	0.00	0.20	0.00	47.27	105.24	2.00	0.00	0.20	0.00
47.32	106.20	2.00	0.00	0.20	0.00	47.40	106.63	2.00	0.00	0.20	0.00
47.46	106.15	2.00	0.00	0.20	0.00	47.58	103.97	2.00	0.00	0.19	0.00
47.69	100.37	2.00	0.00	0.19	0.00	47.76	96.17	2.00	0.00	0.19	0.00
47.81	92.33	2.00	0.00	0.19	0.00	47.89	89.07	2.00	0.00	0.19	0.00
47.94	86.46	2.00	0.00	0.19	0.00	48.01	84.38	2.00	0.00	0.19	0.00
48.06	83.18	2.00	0.00	0.19	0.00	48.12	82.61	2.00	0.00	0.18	0.00
48.17	82.99	2.00	0.00	0.18	0.00	48.25	83.54	2.00	0.00	0.18	0.00
48.29	84.16	2.00	0.00	0.18	0.00	48.43	84.68	2.00	0.00	0.18	0.00
48.48	85.33	2.00	0.00	0.18	0.00	48.54	85.98	2.00	0.00	0.18	0.00
48.60	86.45	2.00	0.00	0.18	0.00	48.66	86.79	2.00	0.00	0.18	0.00
48.73	86.76	2.00	0.00	0.17	0.00	48.78	86.16	2.00	0.00	0.17	0.00
48.86	84.71	2.00	0.00	0.17	0.00	48.91	83.00	2.00	0.00	0.17	0.00
48.96	79.36	2.00	0.00	0.17	0.00	49.04	75.44	2.00	0.00	0.17	0.00
49.09	71.13	2.00	0.00	0.17	0.00	49.22	69.65	2.00	0.00	0.17	0.00
49.27	70.00	2.00	0.00	0.16	0.00	49.35	71.43	2.00	0.00	0.16	0.00
49.39	72.95	2.00	0.00	0.16	0.00	49.48	73.93	2.00	0.00	0.16	0.00
49.52	74.84	2.00	0.00	0.16	0.00	49.59	75.18	2.00	0.00	0.16	0.00
49.65	75.02	2.00	0.00	0.16	0.00	49.70	74.18	2.00	0.00	0.16	0.00
49.78	73.44	2.00	0.00	0.16	0.00	49.83	72.93	2.00	0.00	0.16	0.00
49.88	73.77	2.00	0.00	0.15	0.00	49.95	74.98	2.00	0.00	0.15	0.00
50.01	76.15	2.00	0.00	0.15	0.00						

Total estimated settlement: 0.53

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

LANDMARK
Geo-Engineers and Geologists

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243

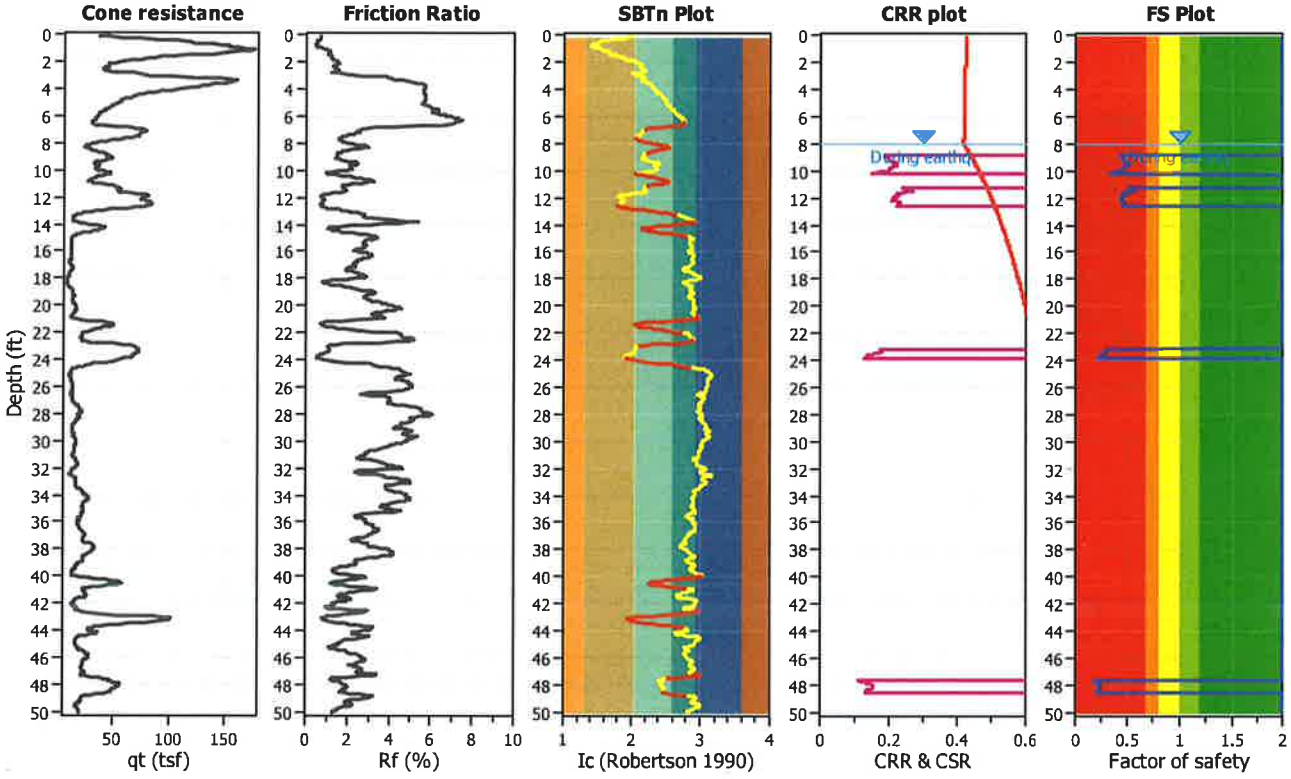
LIQUEFACTION ANALYSIS REPORT

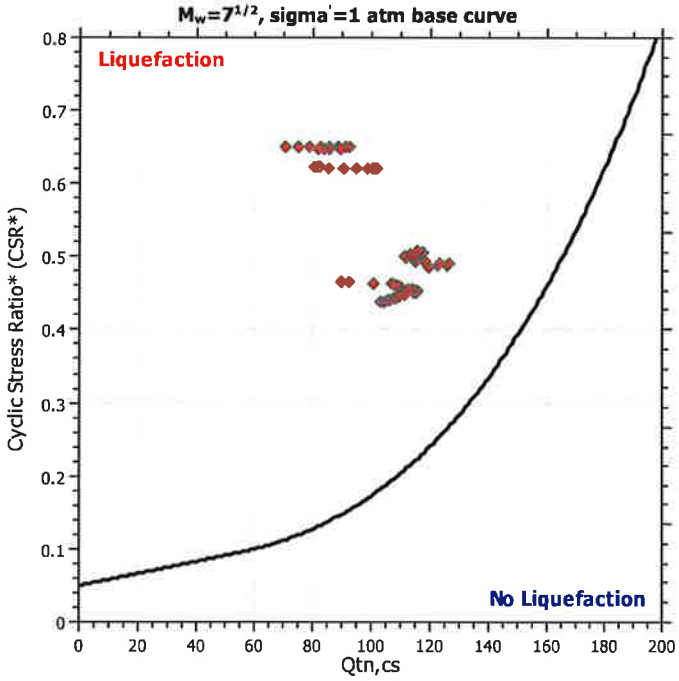
Project title : Heber Meadows Apartments **Location : Heber, CA**

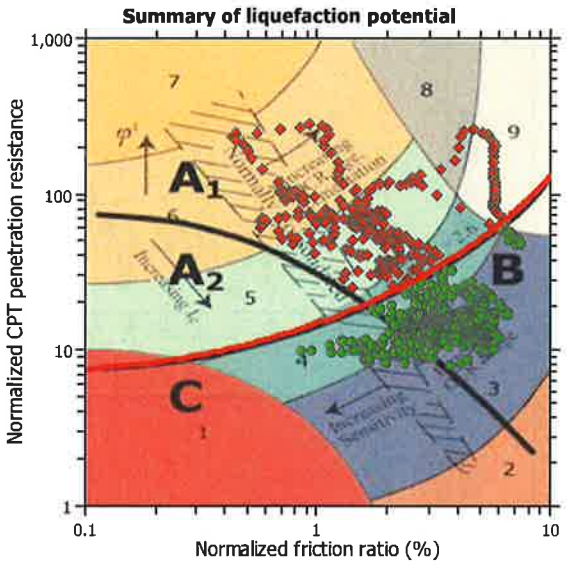
CPT file : CPT-5

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	8.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	8.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude M_w:	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based

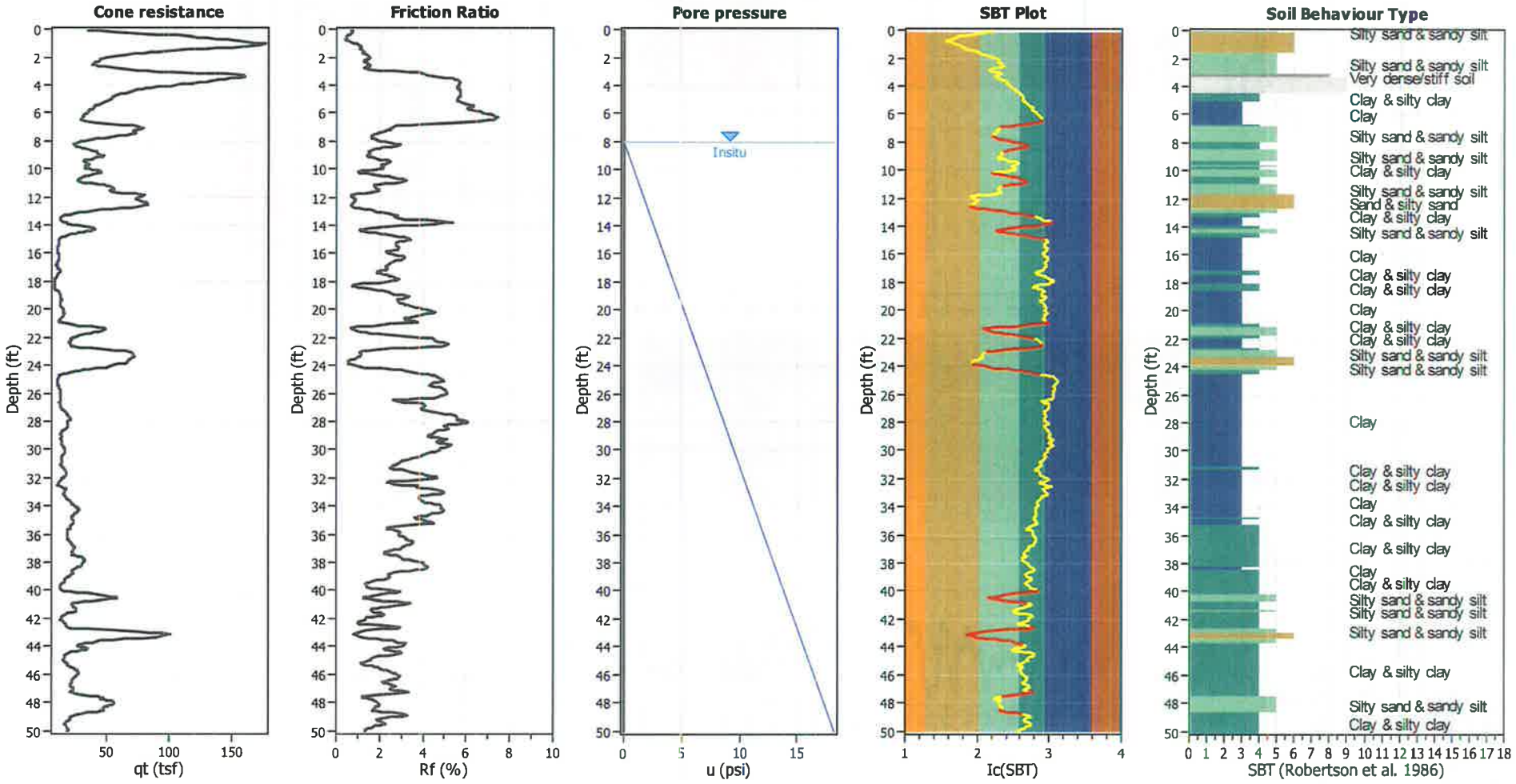






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



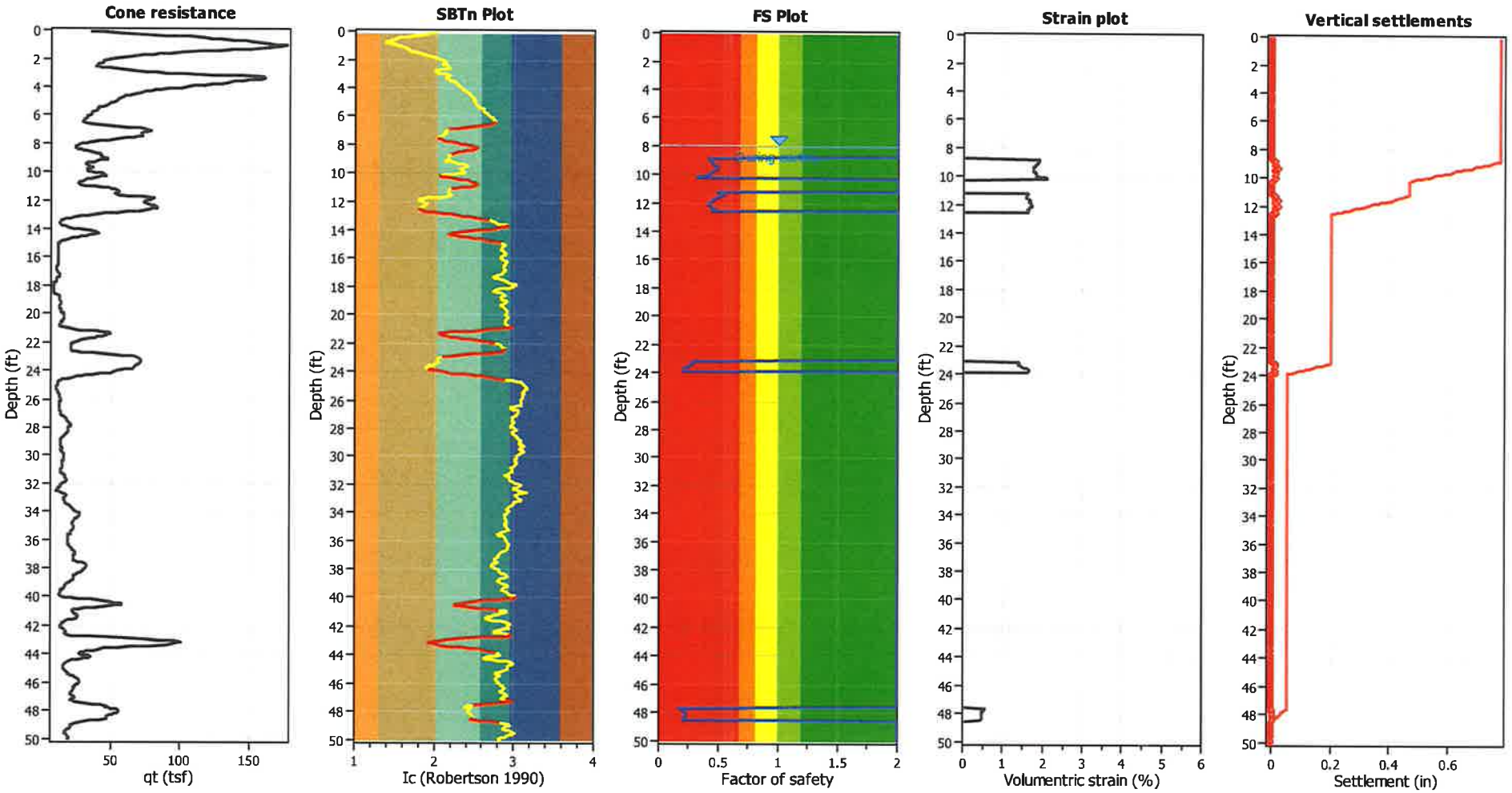
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	8.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
8.02	104.75	2.00	0.00	0.86	0.00	8.09	107.75	2.00	0.00	0.86	0.00
8.21	111.28	2.00	0.00	0.86	0.00	8.27	113.02	2.00	0.00	0.86	0.00
8.32	111.18	2.00	0.00	0.86	0.00	8.38	107.13	2.00	0.00	0.86	0.00
8.45	103.09	2.00	0.00	0.86	0.00	8.51	100.67	2.00	0.00	0.86	0.00
8.58	100.46	2.00	0.00	0.85	0.00	8.63	101.08	2.00	0.00	0.85	0.00
8.70	101.66	2.00	0.00	0.85	0.00	8.76	102.38	2.00	0.00	0.85	0.00
8.82	103.31	0.42	1.94	0.85	0.01	8.89	104.42	0.42	1.92	0.85	0.02
8.94	105.53	0.43	1.90	0.85	0.01	9.01	106.50	0.44	1.88	0.85	0.01
9.07	107.31	0.44	1.87	0.85	0.01	9.13	107.95	0.44	1.86	0.85	0.01
9.19	109.24	0.45	1.83	0.84	0.01	9.32	111.51	0.47	1.80	0.84	0.03
9.38	114.53	0.49	1.76	0.84	0.01	9.45	114.98	0.49	1.75	0.84	0.01
9.51	115.38	0.49	1.74	0.84	0.01	9.56	114.94	0.49	1.75	0.84	0.01
9.63	113.95	0.48	1.76	0.84	0.01	9.69	112.24	0.46	1.78	0.84	0.01
9.75	110.02	0.45	1.80	0.83	0.01	9.82	108.69	0.43	1.82	0.83	0.02
9.87	108.18	0.43	1.82	0.83	0.01	9.93	108.58	0.43	1.82	0.83	0.01
10.00	107.06	0.42	1.84	0.83	0.01	10.07	100.34	0.37	1.93	0.83	0.02
10.13	92.36	0.33	2.07	0.83	0.02	10.17	89.85	0.32	2.11	0.83	0.01
10.25	92.97	2.00	0.00	0.83	0.00	10.31	98.97	2.00	0.00	0.83	0.00
10.37	104.16	2.00	0.00	0.82	0.00	10.45	109.23	2.00	0.00	0.82	0.00
10.51	113.27	2.00	0.00	0.82	0.00	10.57	116.54	2.00	0.00	0.82	0.00
10.65	120.60	2.00	0.00	0.82	0.00	10.70	122.81	2.00	0.00	0.82	0.00
10.83	122.95	2.00	0.00	0.82	0.00	10.88	120.45	2.00	0.00	0.82	0.00
10.96	117.19	2.00	0.00	0.81	0.00	11.02	114.52	2.00	0.00	0.81	0.00
11.07	113.42	2.00	0.00	0.81	0.00	11.13	114.09	2.00	0.00	0.81	0.00
11.19	115.48	2.00	0.00	0.81	0.00	11.25	119.23	0.49	1.64	0.81	0.01
11.33	122.73	0.52	1.60	0.81	0.01	11.37	125.67	0.54	1.56	0.81	0.01
11.44	126.07	0.54	1.56	0.81	0.01	11.50	123.06	0.52	1.59	0.81	0.01
11.63	117.95	0.47	1.64	0.80	0.02	11.68	114.69	0.45	1.67	0.80	0.01
11.73	115.49	0.45	1.66	0.80	0.01	11.81	115.85	0.45	1.66	0.80	0.02
11.86	114.32	0.44	1.67	0.80	0.01	11.93	112.01	0.42	1.70	0.80	0.02
12.04	111.23	0.42	1.70	0.80	0.02	12.11	111.08	0.41	1.70	0.79	0.01
12.17	113.03	0.43	1.68	0.79	0.01	12.24	114.91	0.44	1.65	0.79	0.01
12.30	116.64	0.45	1.63	0.79	0.01	12.35	117.72	0.46	1.62	0.79	0.01
12.43	117.66	0.46	1.61	0.79	0.01	12.47	116.62	0.45	1.62	0.79	0.01
12.54	115.33	0.44	1.64	0.79	0.01	12.60	112.84	2.00	0.00	0.79	0.00
12.66	109.94	2.00	0.00	0.79	0.00	12.73	106.39	2.00	0.00	0.78	0.00
12.78	104.71	2.00	0.00	0.78	0.00	12.85	104.62	2.00	0.00	0.78	0.00
12.91	103.11	2.00	0.00	0.78	0.00	12.98	100.35	2.00	0.00	0.78	0.00
13.04	97.73	2.00	0.00	0.78	0.00	13.09	98.01	2.00	0.00	0.78	0.00
13.15	98.44	2.00	0.00	0.78	0.00	13.22	96.71	2.00	0.00	0.78	0.00
13.28	92.76	2.00	0.00	0.77	0.00	13.36	88.83	2.00	0.00	0.77	0.00
13.42	85.30	2.00	0.00	0.77	0.00	13.46	86.91	2.00	0.00	0.77	0.00
13.55	90.23	2.00	0.00	0.77	0.00	13.59	102.71	2.00	0.00	0.77	0.00
13.73	113.54	2.00	0.00	0.77	0.00	13.79	124.10	2.00	0.00	0.77	0.00
13.81	126.24	2.00	0.00	0.77	0.00	13.86	124.83	2.00	0.00	0.77	0.00
13.94	120.19	2.00	0.00	0.76	0.00	13.99	113.89	2.00	0.00	0.76	0.00
14.05	103.57	2.00	0.00	0.76	0.00	14.18	93.49	2.00	0.00	0.76	0.00
14.26	84.51	2.00	0.00	0.76	0.00	14.30	79.75	2.00	0.00	0.76	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
14.37	79.44	2.00	0.00	0.76	0.00	14.43	81.79	2.00	0.00	0.76	0.00
14.48	85.27	2.00	0.00	0.75	0.00	14.56	87.91	2.00	0.00	0.75	0.00
14.61	90.08	2.00	0.00	0.75	0.00	14.65	90.80	2.00	0.00	0.75	0.00
14.74	91.29	2.00	0.00	0.75	0.00	14.79	91.70	2.00	0.00	0.75	0.00
14.86	91.89	2.00	0.00	0.75	0.00	14.92	90.96	2.00	0.00	0.75	0.00
14.98	89.46	2.00	0.00	0.75	0.00	15.05	86.97	2.00	0.00	0.74	0.00
15.10	84.40	2.00	0.00	0.74	0.00	15.18	81.59	2.00	0.00	0.74	0.00
15.23	80.17	2.00	0.00	0.74	0.00	15.36	79.52	2.00	0.00	0.74	0.00
15.41	79.35	2.00	0.00	0.74	0.00	15.47	79.34	2.00	0.00	0.74	0.00
15.54	79.00	2.00	0.00	0.74	0.00	15.58	79.07	2.00	0.00	0.74	0.00
15.72	78.63	2.00	0.00	0.73	0.00	15.78	76.19	2.00	0.00	0.73	0.00
15.84	73.09	2.00	0.00	0.73	0.00	15.89	70.93	2.00	0.00	0.73	0.00
15.95	72.33	2.00	0.00	0.73	0.00	16.02	76.46	2.00	0.00	0.73	0.00
16.13	79.86	2.00	0.00	0.73	0.00	16.16	82.48	2.00	0.00	0.73	0.00
16.22	82.64	2.00	0.00	0.73	0.00	16.27	82.60	2.00	0.00	0.72	0.00
16.36	81.87	2.00	0.00	0.72	0.00	16.42	80.72	2.00	0.00	0.72	0.00
16.48	78.13	2.00	0.00	0.72	0.00	16.55	75.26	2.00	0.00	0.72	0.00
16.66	72.13	2.00	0.00	0.72	0.00	16.73	70.67	2.00	0.00	0.72	0.00
16.78	69.83	2.00	0.00	0.72	0.00	16.84	69.01	2.00	0.00	0.71	0.00
16.90	69.56	2.00	0.00	0.71	0.00	17.04	70.75	2.00	0.00	0.71	0.00
17.08	73.16	2.00	0.00	0.71	0.00	17.14	72.69	2.00	0.00	0.71	0.00
17.21	71.01	2.00	0.00	0.71	0.00	17.26	68.16	2.00	0.00	0.71	0.00
17.35	67.05	2.00	0.00	0.71	0.00	17.39	67.22	2.00	0.00	0.71	0.00
17.45	68.53	2.00	0.00	0.70	0.00	17.52	69.90	2.00	0.00	0.70	0.00
17.57	71.00	2.00	0.00	0.70	0.00	17.64	71.76	2.00	0.00	0.70	0.00
17.70	72.39	2.00	0.00	0.70	0.00	17.75	72.11	2.00	0.00	0.70	0.00
17.83	70.65	2.00	0.00	0.70	0.00	17.89	68.43	2.00	0.00	0.70	0.00
17.96	66.76	2.00	0.00	0.70	0.00	18.01	64.42	2.00	0.00	0.69	0.00
18.07	58.48	2.00	0.00	0.69	0.00	18.14	50.39	2.00	0.00	0.69	0.00
18.20	43.18	2.00	0.00	0.69	0.00	18.28	41.66	2.00	0.00	0.69	0.00
18.33	43.20	2.00	0.00	0.69	0.00	18.40	46.08	2.00	0.00	0.69	0.00
18.45	49.80	2.00	0.00	0.69	0.00	18.51	56.00	2.00	0.00	0.69	0.00
18.59	61.42	2.00	0.00	0.68	0.00	18.65	66.26	2.00	0.00	0.68	0.00
18.71	72.87	2.00	0.00	0.68	0.00	18.90	78.67	2.00	0.00	0.68	0.00
18.94	84.25	2.00	0.00	0.68	0.00	19.01	85.68	2.00	0.00	0.68	0.00
19.07	86.38	2.00	0.00	0.68	0.00	19.12	85.91	2.00	0.00	0.68	0.00
19.20	84.72	2.00	0.00	0.67	0.00	19.25	83.14	2.00	0.00	0.67	0.00
19.32	81.79	2.00	0.00	0.67	0.00	19.38	80.79	2.00	0.00	0.67	0.00
19.45	80.65	2.00	0.00	0.67	0.00	19.51	81.11	2.00	0.00	0.67	0.00
19.58	82.31	2.00	0.00	0.67	0.00	19.64	84.01	2.00	0.00	0.67	0.00
19.70	86.61	2.00	0.00	0.67	0.00	19.76	89.71	2.00	0.00	0.67	0.00
19.82	92.78	2.00	0.00	0.66	0.00	19.87	96.22	2.00	0.00	0.66	0.00
19.95	99.18	2.00	0.00	0.66	0.00	20.00	102.50	2.00	0.00	0.66	0.00
20.08	105.31	2.00	0.00	0.66	0.00	20.14	107.22	2.00	0.00	0.66	0.00
20.19	107.68	2.00	0.00	0.66	0.00	20.25	105.91	2.00	0.00	0.66	0.00
20.31	103.38	2.00	0.00	0.66	0.00	20.38	98.76	2.00	0.00	0.65	0.00
20.49	93.87	2.00	0.00	0.65	0.00	20.55	88.25	2.00	0.00	0.65	0.00
20.62	85.06	2.00	0.00	0.65	0.00	20.67	84.10	2.00	0.00	0.65	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.74	85.19	2.00	0.00	0.65	0.00	20.80	86.24	2.00	0.00	0.65	0.00
20.93	87.90	2.00	0.00	0.65	0.00	20.99	84.22	2.00	0.00	0.64	0.00
21.16	78.13	2.00	0.00	0.64	0.00	21.24	70.74	2.00	0.00	0.64	0.00
21.28	71.13	2.00	0.00	0.64	0.00	21.33	71.50	2.00	0.00	0.64	0.00
21.41	74.45	2.00	0.00	0.64	0.00	21.46	75.04	2.00	0.00	0.64	0.00
21.55	76.47	2.00	0.00	0.63	0.00	21.59	79.02	2.00	0.00	0.63	0.00
21.64	82.57	2.00	0.00	0.63	0.00	21.68	86.79	2.00	0.00	0.63	0.00
21.73	92.45	2.00	0.00	0.63	0.00	21.83	100.47	2.00	0.00	0.63	0.00
21.93	109.38	2.00	0.00	0.63	0.00	21.98	116.47	2.00	0.00	0.63	0.00
22.03	119.45	2.00	0.00	0.63	0.00	22.12	120.13	2.00	0.00	0.63	0.00
22.17	119.25	2.00	0.00	0.62	0.00	22.26	118.92	2.00	0.00	0.62	0.00
22.32	120.22	2.00	0.00	0.62	0.00	22.37	122.90	2.00	0.00	0.62	0.00
22.43	124.91	2.00	0.00	0.62	0.00	22.47	125.76	2.00	0.00	0.62	0.00
22.55	125.58	2.00	0.00	0.62	0.00	22.61	124.72	2.00	0.00	0.62	0.00
22.67	121.90	2.00	0.00	0.62	0.00	22.74	116.22	2.00	0.00	0.61	0.00
22.79	109.07	2.00	0.00	0.61	0.00	22.84	103.01	2.00	0.00	0.61	0.00
22.91	99.79	2.00	0.00	0.61	0.00	22.97	98.83	2.00	0.00	0.61	0.00
23.05	99.51	2.00	0.00	0.61	0.00	23.15	100.93	0.28	1.41	0.61	0.02
23.22	102.16	0.29	1.39	0.61	0.01	23.33	101.30	0.28	1.40	0.60	0.02
23.40	98.79	0.27	1.42	0.60	0.01	23.47	94.80	0.26	1.47	0.60	0.01
23.53	90.56	0.24	1.52	0.60	0.01	23.58	85.60	0.22	1.59	0.60	0.01
23.66	82.60	0.21	1.64	0.60	0.02	23.71	81.59	0.21	1.65	0.60	0.01
23.77	81.96	0.21	1.64	0.60	0.01	23.84	80.57	0.21	1.66	0.60	0.01
23.89	77.07	2.00	0.00	0.60	0.00	23.91	75.29	2.00	0.00	0.59	0.00
23.98	80.08	2.00	0.00	0.59	0.00	24.15	89.06	2.00	0.00	0.59	0.00
24.21	101.49	2.00	0.00	0.59	0.00	24.28	107.52	2.00	0.00	0.59	0.00
24.29	109.91	2.00	0.00	0.59	0.00	24.36	109.02	2.00	0.00	0.59	0.00
24.42	105.54	2.00	0.00	0.59	0.00	24.51	103.05	2.00	0.00	0.58	0.00
24.55	99.38	2.00	0.00	0.58	0.00	24.65	96.14	2.00	0.00	0.58	0.00
24.70	92.54	2.00	0.00	0.58	0.00	24.75	90.56	2.00	0.00	0.58	0.00
24.86	89.37	2.00	0.00	0.58	0.00	24.91	88.98	2.00	0.00	0.58	0.00
25.00	88.71	2.00	0.00	0.58	0.00	25.07	87.79	2.00	0.00	0.58	0.00
25.13	86.48	2.00	0.00	0.57	0.00	25.20	85.03	2.00	0.00	0.57	0.00
25.26	84.25	2.00	0.00	0.57	0.00	25.32	83.36	2.00	0.00	0.57	0.00
25.39	83.54	2.00	0.00	0.57	0.00	25.44	84.60	2.00	0.00	0.57	0.00
25.51	87.43	2.00	0.00	0.57	0.00	25.57	90.29	2.00	0.00	0.57	0.00
25.62	92.65	2.00	0.00	0.57	0.00	25.70	93.91	2.00	0.00	0.56	0.00
25.75	95.16	2.00	0.00	0.56	0.00	25.82	96.45	2.00	0.00	0.56	0.00
25.93	97.27	2.00	0.00	0.56	0.00	26.00	97.39	2.00	0.00	0.56	0.00
26.06	96.51	2.00	0.00	0.56	0.00	26.11	95.05	2.00	0.00	0.56	0.00
26.19	93.44	2.00	0.00	0.56	0.00	26.24	91.69	2.00	0.00	0.56	0.00
26.32	89.46	2.00	0.00	0.55	0.00	26.36	82.80	2.00	0.00	0.55	0.00
26.43	75.74	2.00	0.00	0.55	0.00	26.50	70.55	2.00	0.00	0.55	0.00
26.56	72.58	2.00	0.00	0.55	0.00	26.63	76.06	2.00	0.00	0.55	0.00
26.68	79.24	2.00	0.00	0.55	0.00	26.71	82.48	2.00	0.00	0.55	0.00
26.80	85.11	2.00	0.00	0.55	0.00	26.87	87.01	2.00	0.00	0.54	0.00
26.99	87.62	2.00	0.00	0.54	0.00	27.05	88.10	2.00	0.00	0.54	0.00
27.09	87.65	2.00	0.00	0.54	0.00	27.16	89.28	2.00	0.00	0.54	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
27.22	92.24	2.00	0.00	0.54	0.00	27.28	99.15	2.00	0.00	0.54	0.00
27.40	105.01	2.00	0.00	0.54	0.00	27.47	110.04	2.00	0.00	0.53	0.00
27.53	112.84	2.00	0.00	0.53	0.00	27.58	117.19	2.00	0.00	0.53	0.00
27.74	120.56	2.00	0.00	0.53	0.00	27.80	123.14	2.00	0.00	0.53	0.00
27.86	122.87	2.00	0.00	0.53	0.00	27.93	122.25	2.00	0.00	0.53	0.00
27.98	121.53	2.00	0.00	0.53	0.00	28.06	120.35	2.00	0.00	0.52	0.00
28.11	118.51	2.00	0.00	0.52	0.00	28.17	115.50	2.00	0.00	0.52	0.00
28.24	112.83	2.00	0.00	0.52	0.00	28.29	110.96	2.00	0.00	0.52	0.00
28.34	110.16	2.00	0.00	0.52	0.00	28.42	109.32	2.00	0.00	0.52	0.00
28.47	106.54	2.00	0.00	0.52	0.00	28.60	102.57	2.00	0.00	0.52	0.00
28.66	97.47	2.00	0.00	0.51	0.00	28.73	93.62	2.00	0.00	0.51	0.00
28.82	90.41	2.00	0.00	0.51	0.00	28.91	88.58	2.00	0.00	0.51	0.00
28.96	87.85	2.00	0.00	0.51	0.00	29.04	88.23	2.00	0.00	0.51	0.00
29.09	89.61	2.00	0.00	0.51	0.00	29.15	91.76	2.00	0.00	0.51	0.00
29.22	93.08	2.00	0.00	0.50	0.00	29.28	93.46	2.00	0.00	0.50	0.00
29.34	92.80	2.00	0.00	0.50	0.00	29.39	92.61	2.00	0.00	0.50	0.00
29.47	92.98	2.00	0.00	0.50	0.00	29.53	93.88	2.00	0.00	0.50	0.00
29.58	94.68	2.00	0.00	0.50	0.00	29.61	95.60	2.00	0.00	0.50	0.00
29.66	97.28	2.00	0.00	0.50	0.00	29.77	98.73	2.00	0.00	0.50	0.00
29.84	99.32	2.00	0.00	0.49	0.00	29.89	99.12	2.00	0.00	0.49	0.00
29.97	98.92	2.00	0.00	0.49	0.00	30.02	98.93	2.00	0.00	0.49	0.00
30.08	98.19	2.00	0.00	0.49	0.00	30.15	96.77	2.00	0.00	0.49	0.00
30.20	94.33	2.00	0.00	0.49	0.00	30.28	91.88	2.00	0.00	0.49	0.00
30.33	89.84	2.00	0.00	0.49	0.00	30.39	87.95	2.00	0.00	0.49	0.00
30.46	85.81	2.00	0.00	0.48	0.00	30.59	82.67	2.00	0.00	0.48	0.00
30.70	79.86	2.00	0.00	0.48	0.00	30.77	77.55	2.00	0.00	0.48	0.00
30.81	76.05	2.00	0.00	0.48	0.00	30.89	74.77	2.00	0.00	0.48	0.00
30.95	73.84	2.00	0.00	0.48	0.00	31.00	72.50	2.00	0.00	0.47	0.00
31.08	71.43	2.00	0.00	0.47	0.00	31.12	70.37	2.00	0.00	0.47	0.00
31.20	70.46	2.00	0.00	0.47	0.00	31.25	70.67	2.00	0.00	0.47	0.00
31.31	71.93	2.00	0.00	0.47	0.00	31.39	74.07	2.00	0.00	0.47	0.00
31.43	80.59	2.00	0.00	0.47	0.00	31.56	86.47	2.00	0.00	0.47	0.00
31.68	91.59	2.00	0.00	0.46	0.00	31.74	93.13	2.00	0.00	0.46	0.00
31.80	94.44	2.00	0.00	0.46	0.00	31.87	95.26	2.00	0.00	0.46	0.00
31.92	94.85	2.00	0.00	0.46	0.00	32.00	92.63	2.00	0.00	0.46	0.00
32.05	89.35	2.00	0.00	0.46	0.00	32.11	82.32	2.00	0.00	0.46	0.00
32.18	74.25	2.00	0.00	0.45	0.00	32.23	66.26	2.00	0.00	0.45	0.00
32.28	63.71	2.00	0.00	0.45	0.00	32.36	63.42	2.00	0.00	0.45	0.00
32.41	65.00	2.00	0.00	0.45	0.00	32.49	66.37	2.00	0.00	0.45	0.00
32.50	70.08	2.00	0.00	0.45	0.00	32.58	73.45	2.00	0.00	0.45	0.00
32.63	80.41	2.00	0.00	0.45	0.00	32.71	86.97	2.00	0.00	0.45	0.00
32.77	93.69	2.00	0.00	0.44	0.00	32.85	97.82	2.00	0.00	0.44	0.00
32.90	99.38	2.00	0.00	0.44	0.00	33.01	98.68	2.00	0.00	0.44	0.00
33.06	96.88	2.00	0.00	0.44	0.00	33.11	94.70	2.00	0.00	0.44	0.00
33.17	92.37	2.00	0.00	0.44	0.00	33.24	90.06	2.00	0.00	0.44	0.00
33.28	88.51	2.00	0.00	0.44	0.00	33.35	88.55	2.00	0.00	0.43	0.00
33.47	90.55	2.00	0.00	0.43	0.00	33.55	94.38	2.00	0.00	0.43	0.00
33.65	98.66	2.00	0.00	0.43	0.00	33.72	102.11	2.00	0.00	0.43	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
33.70	104.82	2.00	0.00	0.43	0.00	33.83	107.91	2.00	0.00	0.43	0.00
33.90	111.27	2.00	0.00	0.43	0.00	33.96	114.97	2.00	0.00	0.42	0.00
34.04	117.43	2.00	0.00	0.42	0.00	34.08	119.56	2.00	0.00	0.42	0.00
34.15	120.87	2.00	0.00	0.42	0.00	34.21	122.09	2.00	0.00	0.42	0.00
34.26	122.69	2.00	0.00	0.42	0.00	34.33	121.74	2.00	0.00	0.42	0.00
34.39	119.21	2.00	0.00	0.42	0.00	34.46	114.95	2.00	0.00	0.42	0.00
34.52	109.03	2.00	0.00	0.41	0.00	34.65	103.42	2.00	0.00	0.41	0.00
34.70	98.63	2.00	0.00	0.41	0.00	34.76	96.21	2.00	0.00	0.41	0.00
34.83	95.09	2.00	0.00	0.41	0.00	34.88	96.04	2.00	0.00	0.41	0.00
34.94	98.66	2.00	0.00	0.41	0.00	35.01	101.57	2.00	0.00	0.41	0.00
35.08	104.29	2.00	0.00	0.41	0.00	35.14	105.97	2.00	0.00	0.40	0.00
35.20	107.12	2.00	0.00	0.40	0.00	35.26	102.42	2.00	0.00	0.40	0.00
35.32	93.00	2.00	0.00	0.40	0.00	35.45	81.92	2.00	0.00	0.40	0.00
35.50	75.94	2.00	0.00	0.40	0.00	35.58	75.23	2.00	0.00	0.40	0.00
35.63	75.11	2.00	0.00	0.40	0.00	35.67	75.72	2.00	0.00	0.40	0.00
35.71	77.40	2.00	0.00	0.39	0.00	35.78	79.41	2.00	0.00	0.39	0.00
35.83	80.80	2.00	0.00	0.39	0.00	35.92	80.48	2.00	0.00	0.39	0.00
35.97	79.50	2.00	0.00	0.39	0.00	36.05	78.99	2.00	0.00	0.39	0.00
36.11	79.89	2.00	0.00	0.39	0.00	36.18	81.26	2.00	0.00	0.39	0.00
36.23	82.69	2.00	0.00	0.39	0.00	36.31	83.43	2.00	0.00	0.38	0.00
36.35	84.76	2.00	0.00	0.38	0.00	36.44	86.28	2.00	0.00	0.38	0.00
36.49	88.55	2.00	0.00	0.38	0.00	36.58	89.92	2.00	0.00	0.38	0.00
36.65	90.87	2.00	0.00	0.38	0.00	36.71	90.93	2.00	0.00	0.38	0.00
36.77	90.62	2.00	0.00	0.38	0.00	36.84	90.16	2.00	0.00	0.38	0.00
36.89	89.49	2.00	0.00	0.37	0.00	36.97	88.69	2.00	0.00	0.37	0.00
37.02	87.28	2.00	0.00	0.37	0.00	37.10	82.91	2.00	0.00	0.37	0.00
37.15	79.05	2.00	0.00	0.37	0.00	37.27	75.33	2.00	0.00	0.37	0.00
37.33	75.32	2.00	0.00	0.37	0.00	37.38	76.28	2.00	0.00	0.37	0.00
37.46	79.66	2.00	0.00	0.37	0.00	37.50	85.41	2.00	0.00	0.36	0.00
37.56	90.60	2.00	0.00	0.36	0.00	37.61	95.05	2.00	0.00	0.36	0.00
37.71	97.26	2.00	0.00	0.36	0.00	37.77	99.90	2.00	0.00	0.36	0.00
37.81	103.99	2.00	0.00	0.36	0.00	37.92	108.54	2.00	0.00	0.36	0.00
37.99	111.72	2.00	0.00	0.36	0.00	38.03	112.32	2.00	0.00	0.36	0.00
38.08	111.84	2.00	0.00	0.35	0.00	38.13	111.43	2.00	0.00	0.35	0.00
38.21	111.26	2.00	0.00	0.35	0.00	38.26	110.80	2.00	0.00	0.35	0.00
38.34	107.98	2.00	0.00	0.35	0.00	38.44	103.64	2.00	0.00	0.35	0.00
38.48	98.91	2.00	0.00	0.35	0.00	38.53	94.49	2.00	0.00	0.35	0.00
38.62	89.98	2.00	0.00	0.35	0.00	38.66	84.61	2.00	0.00	0.34	0.00
38.76	80.78	2.00	0.00	0.34	0.00	38.79	77.97	2.00	0.00	0.34	0.00
38.85	76.38	2.00	0.00	0.34	0.00	38.95	75.16	2.00	0.00	0.34	0.00
39.00	74.00	2.00	0.00	0.34	0.00	39.05	72.25	2.00	0.00	0.34	0.00
39.15	69.35	2.00	0.00	0.34	0.00	39.22	65.29	2.00	0.00	0.34	0.00
39.27	61.56	2.00	0.00	0.33	0.00	39.33	58.14	2.00	0.00	0.33	0.00
39.39	55.06	2.00	0.00	0.33	0.00	39.45	52.87	2.00	0.00	0.33	0.00
39.51	51.02	2.00	0.00	0.33	0.00	39.58	50.20	2.00	0.00	0.33	0.00
39.64	50.33	2.00	0.00	0.33	0.00	39.76	50.19	2.00	0.00	0.33	0.00
39.82	52.84	2.00	0.00	0.33	0.00	39.89	56.64	2.00	0.00	0.32	0.00
39.94	63.80	2.00	0.00	0.32	0.00	40.01	72.15	2.00	0.00	0.32	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
40.08	80.50	2.00	0.00	0.32	0.00	40.14	86.10	2.00	0.00	0.32	0.00
40.18	89.82	2.00	0.00	0.32	0.00	40.25	90.04	2.00	0.00	0.32	0.00
40.37	87.88	2.00	0.00	0.32	0.00	40.42	83.55	2.00	0.00	0.31	0.00
40.47	81.20	2.00	0.00	0.31	0.00	40.55	81.26	2.00	0.00	0.31	0.00
40.59	82.73	2.00	0.00	0.31	0.00	40.66	86.12	2.00	0.00	0.31	0.00
40.73	89.72	2.00	0.00	0.31	0.00	40.78	91.83	2.00	0.00	0.31	0.00
40.85	91.84	2.00	0.00	0.31	0.00	40.90	89.12	2.00	0.00	0.31	0.00
41.03	84.72	2.00	0.00	0.30	0.00	41.08	79.54	2.00	0.00	0.30	0.00
41.15	75.91	2.00	0.00	0.30	0.00	41.21	73.44	2.00	0.00	0.30	0.00
41.27	70.92	2.00	0.00	0.30	0.00	41.34	68.39	2.00	0.00	0.30	0.00
41.44	66.84	2.00	0.00	0.30	0.00	41.52	66.51	2.00	0.00	0.30	0.00
41.57	66.75	2.00	0.00	0.30	0.00	41.64	66.46	2.00	0.00	0.29	0.00
41.70	65.07	2.00	0.00	0.29	0.00	41.76	62.50	2.00	0.00	0.29	0.00
41.83	58.85	2.00	0.00	0.29	0.00	41.89	54.41	2.00	0.00	0.29	0.00
41.95	51.26	2.00	0.00	0.29	0.00	42.01	49.86	2.00	0.00	0.29	0.00
42.07	49.68	2.00	0.00	0.29	0.00	42.14	49.56	2.00	0.00	0.29	0.00
42.26	47.94	2.00	0.00	0.28	0.00	42.32	47.40	2.00	0.00	0.28	0.00
42.38	49.87	2.00	0.00	0.28	0.00	42.45	57.77	2.00	0.00	0.28	0.00
42.54	66.61	2.00	0.00	0.28	0.00	42.59	75.10	2.00	0.00	0.28	0.00
42.69	80.12	2.00	0.00	0.28	0.00	42.76	81.70	2.00	0.00	0.28	0.00
42.88	82.67	2.00	0.00	0.27	0.00	42.95	87.92	2.00	0.00	0.27	0.00
42.99	92.76	2.00	0.00	0.27	0.00	43.04	95.62	2.00	0.00	0.27	0.00
43.12	96.50	2.00	0.00	0.27	0.00	43.19	97.58	2.00	0.00	0.27	0.00
43.36	97.87	2.00	0.00	0.27	0.00	43.43	100.01	2.00	0.00	0.26	0.00
43.47	100.21	2.00	0.00	0.26	0.00	43.55	99.89	2.00	0.00	0.26	0.00
43.61	100.24	2.00	0.00	0.26	0.00	43.73	99.46	2.00	0.00	0.26	0.00
43.79	98.29	2.00	0.00	0.26	0.00	43.84	94.94	2.00	0.00	0.26	0.00
43.91	91.86	2.00	0.00	0.26	0.00	43.97	89.40	2.00	0.00	0.25	0.00
44.04	87.81	2.00	0.00	0.25	0.00	44.09	86.28	2.00	0.00	0.25	0.00
44.15	84.90	2.00	0.00	0.25	0.00	44.23	83.65	2.00	0.00	0.25	0.00
44.28	82.97	2.00	0.00	0.25	0.00	44.34	82.30	2.00	0.00	0.25	0.00
44.41	80.50	2.00	0.00	0.25	0.00	44.46	76.75	2.00	0.00	0.25	0.00
44.54	70.78	2.00	0.00	0.25	0.00	44.66	64.77	2.00	0.00	0.24	0.00
44.72	59.75	2.00	0.00	0.24	0.00	44.77	57.09	2.00	0.00	0.24	0.00
44.89	55.33	2.00	0.00	0.24	0.00	44.97	54.62	2.00	0.00	0.24	0.00
45.02	53.86	2.00	0.00	0.24	0.00	45.10	52.72	2.00	0.00	0.24	0.00
45.16	51.22	2.00	0.00	0.23	0.00	45.21	50.49	2.00	0.00	0.23	0.00
45.33	51.91	2.00	0.00	0.23	0.00	45.39	55.39	2.00	0.00	0.23	0.00
45.46	59.92	2.00	0.00	0.23	0.00	45.51	63.46	2.00	0.00	0.23	0.00
45.54	67.03	2.00	0.00	0.23	0.00	45.63	70.67	2.00	0.00	0.23	0.00
45.70	74.22	2.00	0.00	0.23	0.00	45.74	77.45	2.00	0.00	0.22	0.00
45.81	80.06	2.00	0.00	0.22	0.00	45.90	82.37	2.00	0.00	0.22	0.00
45.95	83.82	2.00	0.00	0.22	0.00	46.01	84.49	2.00	0.00	0.22	0.00
46.11	84.49	2.00	0.00	0.22	0.00	46.16	83.57	2.00	0.00	0.22	0.00
46.20	81.66	2.00	0.00	0.22	0.00	46.29	79.39	2.00	0.00	0.22	0.00
46.34	76.60	2.00	0.00	0.21	0.00	46.40	73.65	2.00	0.00	0.21	0.00
46.50	70.98	2.00	0.00	0.21	0.00	46.55	69.34	2.00	0.00	0.21	0.00
46.60	70.27	2.00	0.00	0.21	0.00	46.69	71.49	2.00	0.00	0.21	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
46.74	73.10	2.00	0.00	0.21	0.00	46.84	73.90	2.00	0.00	0.21	0.00
46.89	74.81	2.00	0.00	0.21	0.00	46.95	75.23	2.00	0.00	0.20	0.00
47.05	75.51	2.00	0.00	0.20	0.00	47.12	76.83	2.00	0.00	0.20	0.00
47.17	78.89	2.00	0.00	0.20	0.00	47.24	81.15	2.00	0.00	0.20	0.00
47.30	82.42	2.00	0.00	0.20	0.00	47.35	79.05	2.00	0.00	0.20	0.00
47.48	73.56	2.00	0.00	0.20	0.00	47.53	67.42	2.00	0.00	0.19	0.00
47.57	67.98	2.00	0.00	0.19	0.00	47.66	70.53	0.17	0.60	0.19	0.01
47.72	74.88	0.18	0.57	0.19	0.00	47.77	78.51	0.19	0.54	0.19	0.00
47.79	82.30	0.20	0.52	0.19	0.00	47.87	85.45	0.21	0.50	0.19	0.00
47.92	88.69	0.22	0.48	0.19	0.00	48.02	91.01	0.23	0.47	0.19	0.01
48.09	92.35	0.24	0.46	0.18	0.00	48.14	92.55	0.24	0.46	0.18	0.00
48.20	91.47	0.23	0.46	0.18	0.00	48.27	89.31	0.23	0.47	0.18	0.00
48.33	85.51	0.21	0.48	0.18	0.00	48.40	83.70	0.21	0.49	0.18	0.00
48.45	81.76	0.20	0.49	0.18	0.00	48.51	81.66	0.20	0.49	0.18	0.00
48.58	81.38	2.00	0.00	0.18	0.00	48.63	83.51	2.00	0.00	0.18	0.00
48.71	86.60	2.00	0.00	0.17	0.00	48.76	88.91	2.00	0.00	0.17	0.00
48.82	88.85	2.00	0.00	0.17	0.00	48.89	84.27	2.00	0.00	0.17	0.00
49.02	77.94	2.00	0.00	0.17	0.00	49.07	71.24	2.00	0.00	0.17	0.00
49.12	67.04	2.00	0.00	0.17	0.00	49.20	63.99	2.00	0.00	0.17	0.00
49.25	62.40	2.00	0.00	0.17	0.00	49.32	62.25	2.00	0.00	0.16	0.00
49.37	62.41	2.00	0.00	0.16	0.00	49.44	62.39	2.00	0.00	0.16	0.00
49.51	62.36	2.00	0.00	0.16	0.00	49.55	61.81	2.00	0.00	0.16	0.00
49.61	60.01	2.00	0.00	0.16	0.00	49.68	57.96	2.00	0.00	0.16	0.00
49.80	56.09	2.00	0.00	0.16	0.00	49.86	55.16	2.00	0.00	0.15	0.00
49.93	54.27	2.00	0.00	0.15	0.00	49.99	53.65	2.00	0.00	0.15	0.00
50.05	53.38	2.00	0.00	0.15	0.00						

Total estimated settlement: 0.78

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

LANDMARK
Geo-Engineers and Geologists

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243

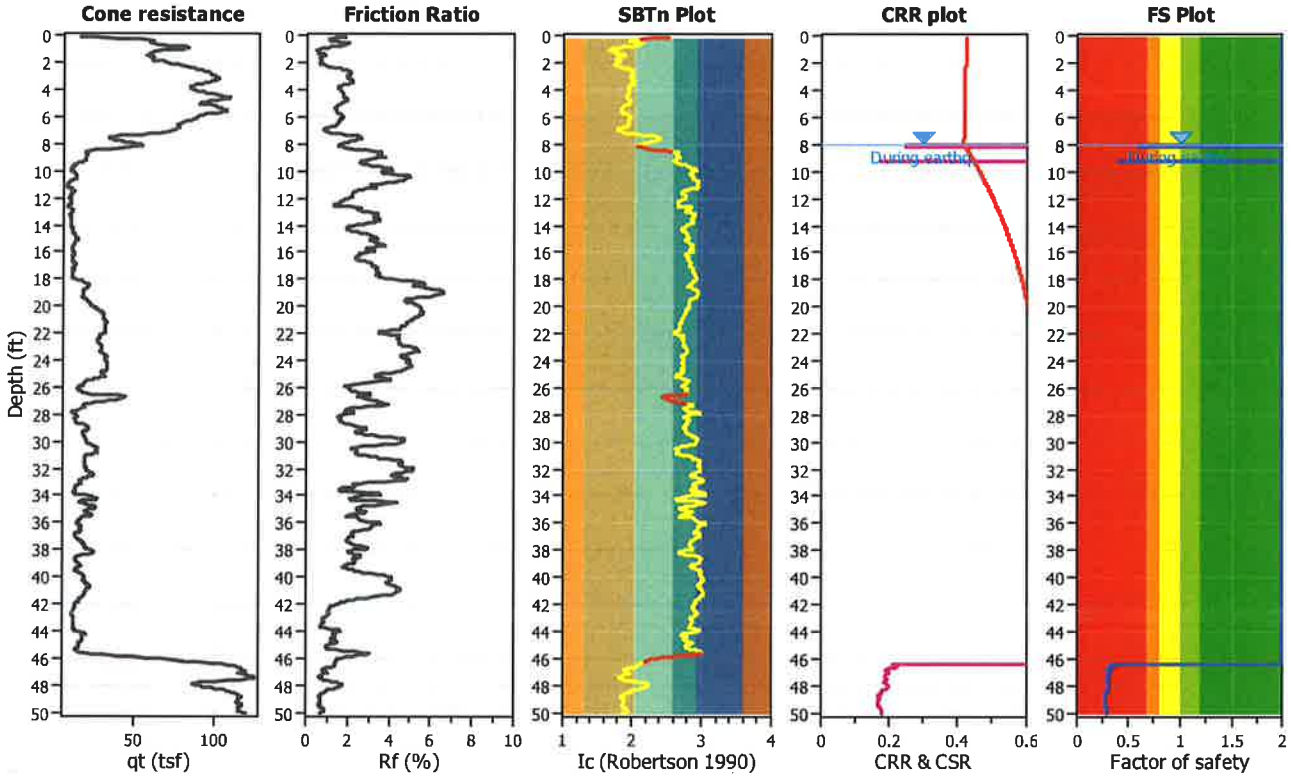
LIQUEFACTION ANALYSIS REPORT

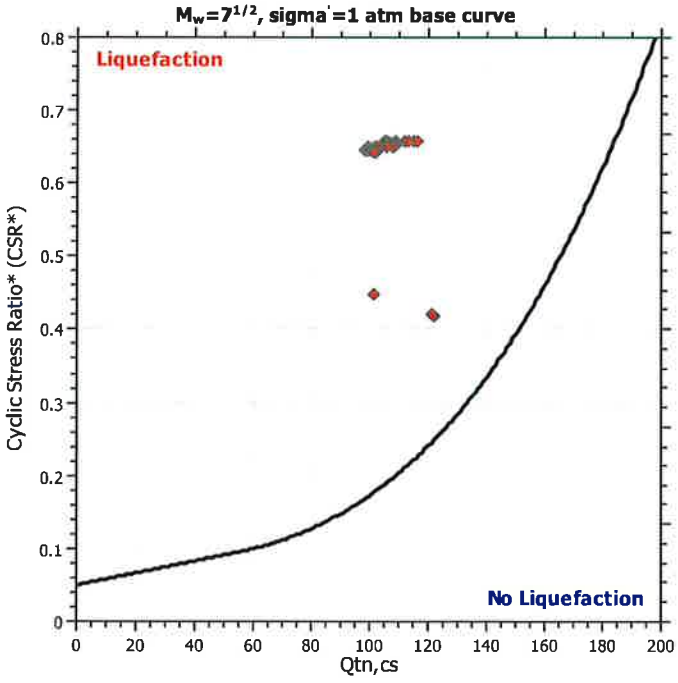
Project title : Heber Meadows Apartments **Location : Heber, CA**

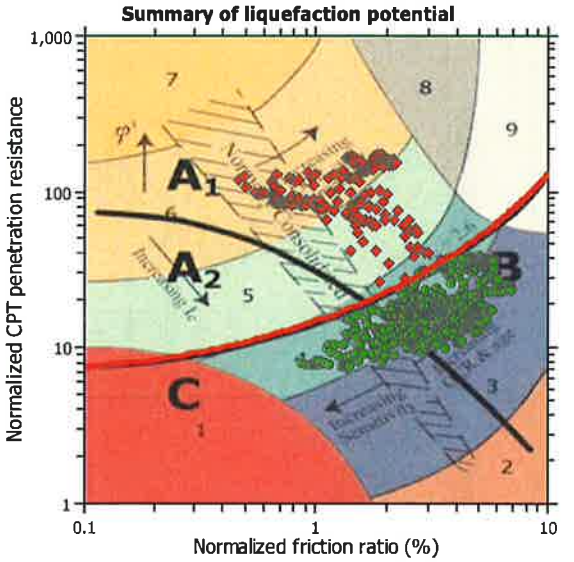
CPT file : CPT-7

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	8.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	8.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.60	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

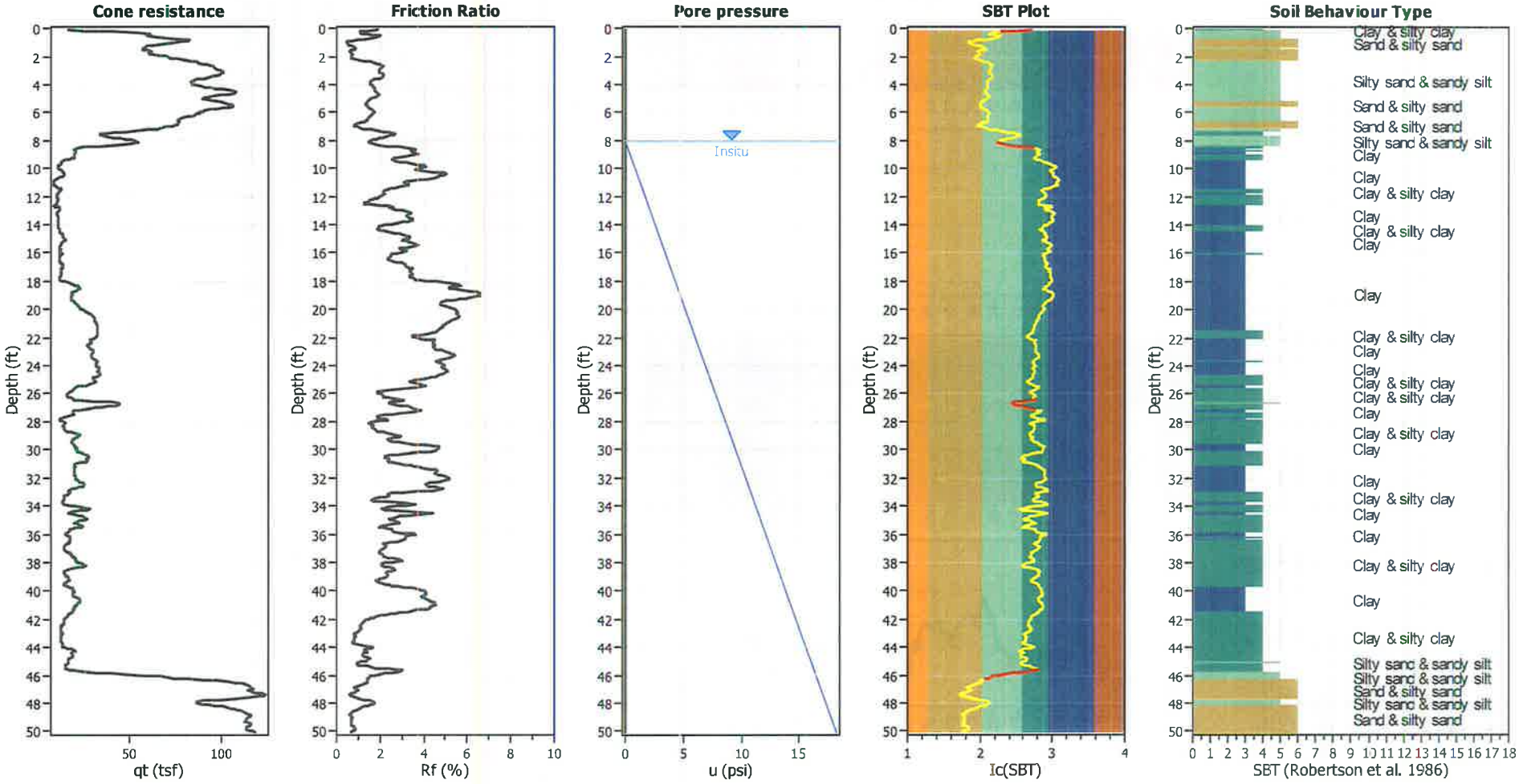






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



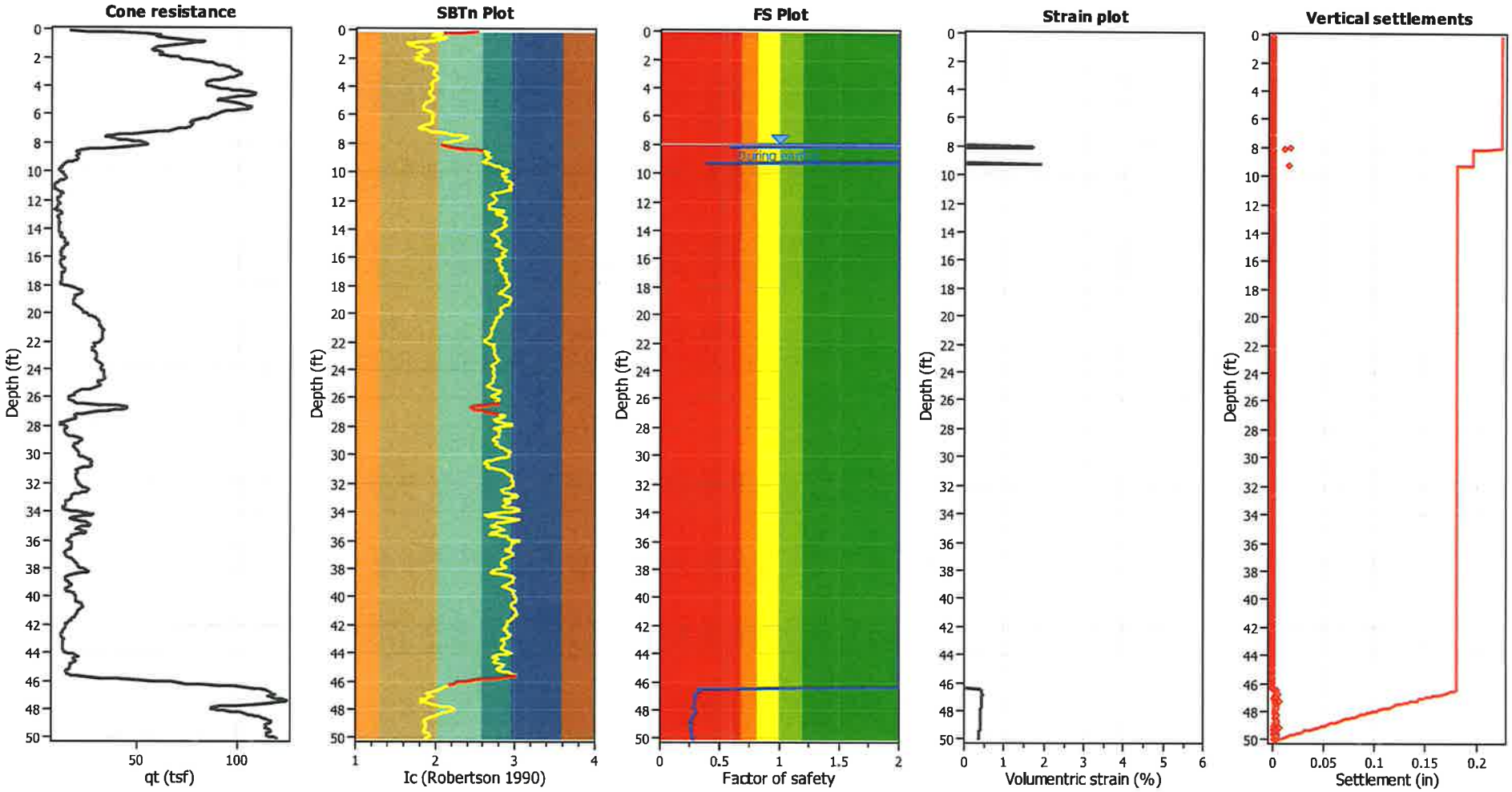
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	8.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	8.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
8.04	121.84	0.59	1.72	0.86	0.02	8.09	121.30	0.59	1.72	0.86	0.01
8.15	121.90	2.00	0.00	0.86	0.00	8.21	120.52	2.00	0.00	0.86	0.00
8.34	117.25	2.00	0.00	0.86	0.00	8.40	114.54	2.00	0.00	0.86	0.00
8.46	114.65	2.00	0.00	0.86	0.00	8.52	115.70	2.00	0.00	0.86	0.00
8.61	117.11	2.00	0.00	0.85	0.00	8.66	117.52	2.00	0.00	0.85	0.00
8.70	116.97	2.00	0.00	0.85	0.00	8.78	116.40	2.00	0.00	0.85	0.00
8.83	116.87	2.00	0.00	0.85	0.00	8.90	117.98	2.00	0.00	0.85	0.00
8.95	118.79	2.00	0.00	0.85	0.00	9.01	114.31	2.00	0.00	0.85	0.00
9.15	108.32	2.00	0.00	0.84	0.00	9.22	100.97	0.39	1.96	0.84	0.02
9.27	97.22	2.00	0.00	0.84	0.00	9.32	94.04	2.00	0.00	0.84	0.00
9.36	90.73	2.00	0.00	0.84	0.00	9.40	87.87	2.00	0.00	0.84	0.00
9.50	87.71	2.00	0.00	0.84	0.00	9.56	89.60	2.00	0.00	0.84	0.00
9.61	92.81	2.00	0.00	0.84	0.00	9.66	95.72	2.00	0.00	0.84	0.00
9.76	97.69	2.00	0.00	0.83	0.00	9.80	98.53	2.00	0.00	0.83	0.00
9.85	97.91	2.00	0.00	0.83	0.00	9.91	97.29	2.00	0.00	0.83	0.00
10.02	96.76	2.00	0.00	0.83	0.00	10.07	96.52	2.00	0.00	0.83	0.00
10.12	99.97	2.00	0.00	0.83	0.00	10.21	105.37	2.00	0.00	0.83	0.00
10.25	113.46	2.00	0.00	0.83	0.00	10.34	119.18	2.00	0.00	0.82	0.00
10.40	121.93	2.00	0.00	0.82	0.00	10.47	121.15	2.00	0.00	0.82	0.00
10.51	117.41	2.00	0.00	0.82	0.00	10.60	113.73	2.00	0.00	0.82	0.00
10.64	107.96	2.00	0.00	0.82	0.00	10.73	102.24	2.00	0.00	0.82	0.00
10.77	94.24	2.00	0.00	0.82	0.00	10.86	88.95	2.00	0.00	0.82	0.00
10.91	83.22	2.00	0.00	0.82	0.00	10.96	80.70	2.00	0.00	0.81	0.00
11.03	79.27	2.00	0.00	0.81	0.00	11.14	80.83	2.00	0.00	0.81	0.00
11.21	82.08	2.00	0.00	0.81	0.00	11.26	82.33	2.00	0.00	0.81	0.00
11.30	81.84	2.00	0.00	0.81	0.00	11.38	81.44	2.00	0.00	0.81	0.00
11.44	80.96	2.00	0.00	0.81	0.00	11.49	79.70	2.00	0.00	0.81	0.00
11.57	77.89	2.00	0.00	0.80	0.00	11.62	75.34	2.00	0.00	0.80	0.00
11.69	73.66	2.00	0.00	0.80	0.00	11.80	72.96	2.00	0.00	0.80	0.00
11.87	71.83	2.00	0.00	0.80	0.00	11.98	70.03	2.00	0.00	0.80	0.00
12.05	68.21	2.00	0.00	0.80	0.00	12.10	67.60	2.00	0.00	0.79	0.00
12.16	66.73	2.00	0.00	0.79	0.00	12.23	65.26	2.00	0.00	0.79	0.00
12.30	63.17	2.00	0.00	0.79	0.00	12.41	59.17	2.00	0.00	0.79	0.00
12.49	56.63	2.00	0.00	0.79	0.00	12.55	56.26	2.00	0.00	0.79	0.00
12.59	61.14	2.00	0.00	0.79	0.00	12.64	66.66	2.00	0.00	0.79	0.00
12.67	72.42	2.00	0.00	0.79	0.00	12.76	76.79	2.00	0.00	0.78	0.00
12.81	79.23	2.00	0.00	0.78	0.00	12.91	81.27	2.00	0.00	0.78	0.00
12.96	83.77	2.00	0.00	0.78	0.00	13.01	86.82	2.00	0.00	0.78	0.00
13.10	88.36	2.00	0.00	0.78	0.00	13.15	88.64	2.00	0.00	0.78	0.00
13.21	88.07	2.00	0.00	0.78	0.00	13.26	87.48	2.00	0.00	0.78	0.00
13.41	87.39	2.00	0.00	0.77	0.00	13.46	88.73	2.00	0.00	0.77	0.00
13.54	90.80	2.00	0.00	0.77	0.00	13.59	92.38	2.00	0.00	0.77	0.00
13.65	91.94	2.00	0.00	0.77	0.00	13.72	90.38	2.00	0.00	0.77	0.00
13.77	87.73	2.00	0.00	0.77	0.00	13.84	84.42	2.00	0.00	0.77	0.00
13.90	80.90	2.00	0.00	0.76	0.00	13.96	76.67	2.00	0.00	0.76	0.00
14.02	72.91	2.00	0.00	0.76	0.00	14.07	69.72	2.00	0.00	0.76	0.00
14.14	68.73	2.00	0.00	0.76	0.00	14.20	68.61	2.00	0.00	0.76	0.00
14.26	69.05	2.00	0.00	0.76	0.00	14.33	69.82	2.00	0.00	0.76	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
14.38	71.30	2.00	0.00	0.76	0.00	14.45	73.82	2.00	0.00	0.76	0.00
14.52	77.44	2.00	0.00	0.75	0.00	14.58	82.19	2.00	0.00	0.75	0.00
14.65	86.89	2.00	0.00	0.75	0.00	14.76	90.87	2.00	0.00	0.75	0.00
14.82	93.75	2.00	0.00	0.75	0.00	14.87	95.72	2.00	0.00	0.75	0.00
14.95	96.58	2.00	0.00	0.75	0.00	15.00	96.10	2.00	0.00	0.75	0.00
15.07	94.34	2.00	0.00	0.74	0.00	15.12	93.26	2.00	0.00	0.74	0.00
15.18	93.24	2.00	0.00	0.74	0.00	15.24	94.64	2.00	0.00	0.74	0.00
15.36	95.78	2.00	0.00	0.74	0.00	15.44	96.73	2.00	0.00	0.74	0.00
15.49	96.67	2.00	0.00	0.74	0.00	15.55	91.94	2.00	0.00	0.74	0.00
15.62	87.42	2.00	0.00	0.74	0.00	15.66	83.48	2.00	0.00	0.73	0.00
15.75	84.23	2.00	0.00	0.73	0.00	15.80	85.22	2.00	0.00	0.73	0.00
15.86	86.84	2.00	0.00	0.73	0.00	15.89	87.23	2.00	0.00	0.73	0.00
15.97	85.84	2.00	0.00	0.73	0.00	16.04	83.36	2.00	0.00	0.73	0.00
16.09	81.38	2.00	0.00	0.73	0.00	16.17	79.77	2.00	0.00	0.73	0.00
16.21	78.03	2.00	0.00	0.73	0.00	16.31	76.52	2.00	0.00	0.72	0.00
16.35	75.09	2.00	0.00	0.72	0.00	16.41	74.56	2.00	0.00	0.72	0.00
16.50	75.11	2.00	0.00	0.72	0.00	16.55	77.92	2.00	0.00	0.72	0.00
16.65	81.61	2.00	0.00	0.72	0.00	16.70	85.61	2.00	0.00	0.72	0.00
16.76	88.16	2.00	0.00	0.72	0.00	16.82	89.51	2.00	0.00	0.71	0.00
16.87	90.05	2.00	0.00	0.71	0.00	16.99	90.59	2.00	0.00	0.71	0.00
17.04	91.11	2.00	0.00	0.71	0.00	17.09	91.35	2.00	0.00	0.71	0.00
17.14	90.71	2.00	0.00	0.71	0.00	17.22	89.93	2.00	0.00	0.71	0.00
17.26	89.28	2.00	0.00	0.71	0.00	17.33	89.72	2.00	0.00	0.71	0.00
17.39	90.73	2.00	0.00	0.71	0.00	17.51	91.07	2.00	0.00	0.70	0.00
17.57	90.28	2.00	0.00	0.70	0.00	17.63	88.76	2.00	0.00	0.70	0.00
17.70	88.07	2.00	0.00	0.70	0.00	17.75	88.23	2.00	0.00	0.70	0.00
17.80	88.91	2.00	0.00	0.70	0.00	17.88	90.01	2.00	0.00	0.70	0.00
17.93	93.96	2.00	0.00	0.70	0.00	18.00	101.36	2.00	0.00	0.69	0.00
18.06	111.83	2.00	0.00	0.69	0.00	18.14	124.18	2.00	0.00	0.69	0.00
18.24	136.42	2.00	0.00	0.69	0.00	18.31	142.63	2.00	0.00	0.69	0.00
18.37	141.64	2.00	0.00	0.69	0.00	18.42	139.13	2.00	0.00	0.69	0.00
18.50	139.04	2.00	0.00	0.69	0.00	18.56	141.93	2.00	0.00	0.69	0.00
18.68	142.84	2.00	0.00	0.68	0.00	18.73	143.87	2.00	0.00	0.68	0.00
18.77	144.39	2.00	0.00	0.68	0.00	18.88	144.61	2.00	0.00	0.68	0.00
18.93	144.40	2.00	0.00	0.68	0.00	19.00	143.82	2.00	0.00	0.68	0.00
19.05	142.01	2.00	0.00	0.68	0.00	19.14	138.46	2.00	0.00	0.68	0.00
19.24	135.00	2.00	0.00	0.67	0.00	19.28	131.16	2.00	0.00	0.67	0.00
19.35	128.17	2.00	0.00	0.67	0.00	19.41	125.61	2.00	0.00	0.67	0.00
19.48	124.32	2.00	0.00	0.67	0.00	19.54	126.32	2.00	0.00	0.67	0.00
19.71	129.11	2.00	0.00	0.67	0.00	19.76	134.71	2.00	0.00	0.67	0.00
19.89	138.32	2.00	0.00	0.66	0.00	19.95	142.24	2.00	0.00	0.66	0.00
20.01	144.51	2.00	0.00	0.66	0.00	20.07	147.48	2.00	0.00	0.66	0.00
20.15	150.12	2.00	0.00	0.66	0.00	20.20	152.20	2.00	0.00	0.66	0.00
20.25	153.97	2.00	0.00	0.66	0.00	20.32	155.97	2.00	0.00	0.66	0.00
20.38	158.74	2.00	0.00	0.65	0.00	20.44	160.84	2.00	0.00	0.65	0.00
20.51	161.61	2.00	0.00	0.65	0.00	20.56	160.99	2.00	0.00	0.65	0.00
20.64	159.53	2.00	0.00	0.65	0.00	20.69	158.19	2.00	0.00	0.65	0.00
20.75	156.77	2.00	0.00	0.65	0.00	20.81	155.34	2.00	0.00	0.65	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
20.86	154.00	2.00	0.00	0.65	0.00	20.91	153.35	2.00	0.00	0.65	0.00
21.00	152.70	2.00	0.00	0.64	0.00	21.05	152.34	2.00	0.00	0.64	0.00
21.13	151.85	2.00	0.00	0.64	0.00	21.17	151.74	2.00	0.00	0.64	0.00
21.24	151.18	2.00	0.00	0.64	0.00	21.31	150.34	2.00	0.00	0.64	0.00
21.35	148.82	2.00	0.00	0.64	0.00	21.43	147.00	2.00	0.00	0.64	0.00
21.49	145.05	2.00	0.00	0.64	0.00	21.61	143.48	2.00	0.00	0.63	0.00
21.66	142.23	2.00	0.00	0.63	0.00	21.74	136.37	2.00	0.00	0.63	0.00
21.80	130.29	2.00	0.00	0.63	0.00	21.84	124.08	2.00	0.00	0.63	0.00
21.92	122.97	2.00	0.00	0.63	0.00	21.98	123.66	2.00	0.00	0.63	0.00
22.05	125.87	2.00	0.00	0.63	0.00	22.10	129.96	2.00	0.00	0.63	0.00
22.15	132.66	2.00	0.00	0.62	0.00	22.18	134.29	2.00	0.00	0.62	0.00
22.33	133.81	2.00	0.00	0.62	0.00	22.37	133.42	2.00	0.00	0.62	0.00
22.41	132.99	2.00	0.00	0.62	0.00	22.45	132.47	2.00	0.00	0.62	0.00
22.52	131.89	2.00	0.00	0.62	0.00	22.62	131.38	2.00	0.00	0.62	0.00
22.65	132.27	2.00	0.00	0.62	0.00	22.77	133.90	2.00	0.00	0.61	0.00
22.82	136.33	2.00	0.00	0.61	0.00	22.86	138.36	2.00	0.00	0.61	0.00
22.91	141.16	2.00	0.00	0.61	0.00	22.99	143.78	2.00	0.00	0.61	0.00
23.03	146.59	2.00	0.00	0.61	0.00	23.12	148.27	2.00	0.00	0.61	0.00
23.22	149.05	2.00	0.00	0.61	0.00	23.27	148.98	2.00	0.00	0.61	0.00
23.32	147.97	2.00	0.00	0.60	0.00	23.37	146.61	2.00	0.00	0.60	0.00
23.43	144.53	2.00	0.00	0.60	0.00	23.58	142.65	2.00	0.00	0.60	0.00
23.64	141.58	2.00	0.00	0.60	0.00	23.70	141.60	2.00	0.00	0.60	0.00
23.75	142.24	2.00	0.00	0.60	0.00	23.83	143.17	2.00	0.00	0.60	0.00
23.88	144.50	2.00	0.00	0.60	0.00	23.94	145.46	2.00	0.00	0.59	0.00
24.01	145.75	2.00	0.00	0.59	0.00	24.05	145.84	2.00	0.00	0.59	0.00
24.12	146.18	2.00	0.00	0.59	0.00	24.19	147.14	2.00	0.00	0.59	0.00
24.25	148.25	2.00	0.00	0.59	0.00	24.31	148.80	2.00	0.00	0.59	0.00
24.36	148.88	2.00	0.00	0.59	0.00	24.42	148.30	2.00	0.00	0.59	0.00
24.49	147.38	2.00	0.00	0.58	0.00	24.56	146.05	2.00	0.00	0.58	0.00
24.62	144.42	2.00	0.00	0.58	0.00	24.67	140.98	2.00	0.00	0.58	0.00
24.81	137.57	2.00	0.00	0.58	0.00	24.86	131.63	2.00	0.00	0.58	0.00
24.93	125.91	2.00	0.00	0.58	0.00	24.99	118.99	2.00	0.00	0.58	0.00
25.12	115.46	2.00	0.00	0.57	0.00	25.17	115.40	2.00	0.00	0.57	0.00
25.24	118.00	2.00	0.00	0.57	0.00	25.29	119.13	2.00	0.00	0.57	0.00
25.39	117.67	2.00	0.00	0.57	0.00	25.44	113.78	2.00	0.00	0.57	0.00
25.48	109.71	2.00	0.00	0.57	0.00	25.53	101.79	2.00	0.00	0.57	0.00
25.64	90.84	2.00	0.00	0.57	0.00	25.75	79.32	2.00	0.00	0.56	0.00
25.82	72.10	2.00	0.00	0.56	0.00	25.88	69.72	2.00	0.00	0.56	0.00
25.93	69.14	2.00	0.00	0.56	0.00	25.98	69.72	2.00	0.00	0.56	0.00
26.06	70.16	2.00	0.00	0.56	0.00	26.11	70.55	2.00	0.00	0.56	0.00
26.19	71.70	2.00	0.00	0.56	0.00	26.24	73.43	2.00	0.00	0.56	0.00
26.31	77.51	2.00	0.00	0.55	0.00	26.37	83.33	2.00	0.00	0.55	0.00
26.42	91.30	2.00	0.00	0.55	0.00	26.50	98.14	2.00	0.00	0.55	0.00
26.54	103.01	2.00	0.00	0.55	0.00	26.62	106.14	2.00	0.00	0.55	0.00
26.68	109.59	2.00	0.00	0.55	0.00	26.73	113.91	2.00	0.00	0.55	0.00
26.85	117.53	2.00	0.00	0.54	0.00	26.91	119.95	2.00	0.00	0.54	0.00
26.97	118.00	2.00	0.00	0.54	0.00	27.03	113.84	2.00	0.00	0.54	0.00
27.09	109.61	2.00	0.00	0.54	0.00	27.16	106.60	2.00	0.00	0.54	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
27.21	101.58	2.00	0.00	0.54	0.00	27.34	94.92	2.00	0.00	0.54	0.00
27.39	87.47	2.00	0.00	0.54	0.00	27.46	82.45	2.00	0.00	0.53	0.00
27.52	76.60	2.00	0.00	0.53	0.00	27.59	68.16	2.00	0.00	0.53	0.00
27.70	64.07	2.00	0.00	0.53	0.00	27.78	60.29	2.00	0.00	0.53	0.00
27.83	64.52	2.00	0.00	0.53	0.00	27.90	64.59	2.00	0.00	0.53	0.00
27.96	64.67	2.00	0.00	0.53	0.00	28.06	61.73	2.00	0.00	0.52	0.00
28.10	59.58	2.00	0.00	0.52	0.00	28.20	59.80	2.00	0.00	0.52	0.00
28.24	60.04	2.00	0.00	0.52	0.00	28.28	59.96	2.00	0.00	0.52	0.00
28.37	59.57	2.00	0.00	0.52	0.00	28.42	59.34	2.00	0.00	0.52	0.00
28.53	62.04	2.00	0.00	0.52	0.00	28.68	65.94	2.00	0.00	0.51	0.00
28.75	73.35	2.00	0.00	0.51	0.00	28.87	80.26	2.00	0.00	0.51	0.00
28.94	86.81	2.00	0.00	0.51	0.00	28.99	89.92	2.00	0.00	0.51	0.00
29.05	89.82	2.00	0.00	0.51	0.00	29.12	87.12	2.00	0.00	0.51	0.00
29.17	83.58	2.00	0.00	0.51	0.00	29.24	79.78	2.00	0.00	0.50	0.00
29.30	77.68	2.00	0.00	0.50	0.00	29.35	77.73	2.00	0.00	0.50	0.00
29.43	80.12	2.00	0.00	0.50	0.00	29.48	83.60	2.00	0.00	0.50	0.00
29.53	89.14	2.00	0.00	0.50	0.00	29.61	95.24	2.00	0.00	0.50	0.00
29.65	101.72	2.00	0.00	0.50	0.00	29.72	106.43	2.00	0.00	0.50	0.00
29.79	109.62	2.00	0.00	0.50	0.00	29.85	110.96	2.00	0.00	0.49	0.00
29.91	110.86	2.00	0.00	0.49	0.00	29.97	110.33	2.00	0.00	0.49	0.00
30.02	110.05	2.00	0.00	0.49	0.00	30.10	109.23	2.00	0.00	0.49	0.00
30.14	107.66	2.00	0.00	0.49	0.00	30.19	103.36	2.00	0.00	0.49	0.00
30.29	98.05	2.00	0.00	0.49	0.00	30.36	92.21	2.00	0.00	0.49	0.00
30.40	87.45	2.00	0.00	0.48	0.00	30.45	84.98	2.00	0.00	0.48	0.00
30.55	84.47	2.00	0.00	0.48	0.00	30.59	86.42	2.00	0.00	0.48	0.00
30.67	87.41	2.00	0.00	0.48	0.00	30.73	87.49	2.00	0.00	0.48	0.00
30.80	86.53	2.00	0.00	0.48	0.00	30.84	86.06	2.00	0.00	0.48	0.00
30.93	85.33	2.00	0.00	0.48	0.00	31.02	86.11	2.00	0.00	0.47	0.00
31.07	87.95	2.00	0.00	0.47	0.00	31.13	91.25	2.00	0.00	0.47	0.00
31.20	93.84	2.00	0.00	0.47	0.00	31.25	95.83	2.00	0.00	0.47	0.00
31.30	98.42	2.00	0.00	0.47	0.00	31.37	101.33	2.00	0.00	0.47	0.00
31.43	104.15	2.00	0.00	0.47	0.00	31.51	104.76	2.00	0.00	0.47	0.00
31.63	104.13	2.00	0.00	0.46	0.00	31.68	103.25	2.00	0.00	0.46	0.00
31.73	104.35	2.00	0.00	0.46	0.00	31.82	106.22	2.00	0.00	0.46	0.00
31.87	108.81	2.00	0.00	0.46	0.00	31.94	110.66	2.00	0.00	0.46	0.00
31.99	112.17	2.00	0.00	0.46	0.00	32.05	112.86	2.00	0.00	0.46	0.00
32.11	113.14	2.00	0.00	0.46	0.00	32.17	113.08	2.00	0.00	0.45	0.00
32.25	112.38	2.00	0.00	0.45	0.00	32.30	111.29	2.00	0.00	0.45	0.00
32.36	110.26	2.00	0.00	0.45	0.00	32.43	109.80	2.00	0.00	0.45	0.00
32.48	110.11	2.00	0.00	0.45	0.00	32.61	109.91	2.00	0.00	0.45	0.00
32.66	109.08	2.00	0.00	0.45	0.00	32.73	107.08	2.00	0.00	0.45	0.00
32.79	104.32	2.00	0.00	0.44	0.00	32.85	99.66	2.00	0.00	0.44	0.00
32.92	94.32	2.00	0.00	0.44	0.00	32.97	87.86	2.00	0.00	0.44	0.00
33.03	80.87	2.00	0.00	0.44	0.00	33.10	74.33	2.00	0.00	0.44	0.00
33.15	70.15	2.00	0.00	0.44	0.00	33.22	68.69	2.00	0.00	0.44	0.00
33.28	67.86	2.00	0.00	0.44	0.00	33.35	65.83	2.00	0.00	0.43	0.00
33.41	63.24	2.00	0.00	0.43	0.00	33.47	59.43	2.00	0.00	0.43	0.00
33.59	57.11	2.00	0.00	0.43	0.00	33.65	57.44	2.00	0.00	0.43	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
33.72	63.97	2.00	0.00	0.43	0.00	33.77	72.02	2.00	0.00	0.43	0.00
33.84	77.97	2.00	0.00	0.43	0.00	33.89	80.77	2.00	0.00	0.43	0.00
33.94	81.31	2.00	0.00	0.42	0.00	33.99	81.48	2.00	0.00	0.42	0.00
34.08	80.68	2.00	0.00	0.42	0.00	34.15	80.46	2.00	0.00	0.42	0.00
34.24	80.77	2.00	0.00	0.42	0.00	34.28	80.99	2.00	0.00	0.42	0.00
34.35	82.46	2.00	0.00	0.42	0.00	34.39	86.06	2.00	0.00	0.42	0.00
34.48	90.04	2.00	0.00	0.42	0.00	34.52	93.19	2.00	0.00	0.41	0.00
34.62	93.18	2.00	0.00	0.41	0.00	34.70	91.57	2.00	0.00	0.41	0.00
34.74	89.34	2.00	0.00	0.41	0.00	34.81	88.24	2.00	0.00	0.41	0.00
34.87	86.86	2.00	0.00	0.41	0.00	34.91	85.40	2.00	0.00	0.41	0.00
34.98	83.91	2.00	0.00	0.41	0.00	35.05	82.55	2.00	0.00	0.41	0.00
35.12	81.95	2.00	0.00	0.40	0.00	35.18	81.91	2.00	0.00	0.40	0.00
35.24	82.29	2.00	0.00	0.40	0.00	35.31	79.36	2.00	0.00	0.40	0.00
35.42	75.80	2.00	0.00	0.40	0.00	35.49	72.58	2.00	0.00	0.40	0.00
35.54	72.93	2.00	0.00	0.40	0.00	35.61	73.40	2.00	0.00	0.40	0.00
35.67	73.36	2.00	0.00	0.40	0.00	35.73	72.68	2.00	0.00	0.39	0.00
35.85	73.41	2.00	0.00	0.39	0.00	35.92	76.07	2.00	0.00	0.39	0.00
35.97	79.03	2.00	0.00	0.39	0.00	36.02	80.28	2.00	0.00	0.39	0.00
36.08	80.28	2.00	0.00	0.39	0.00	36.16	79.43	2.00	0.00	0.39	0.00
36.20	79.66	2.00	0.00	0.39	0.00	36.28	79.91	2.00	0.00	0.39	0.00
36.33	80.38	2.00	0.00	0.38	0.00	36.38	79.71	2.00	0.00	0.38	0.00
36.46	77.53	2.00	0.00	0.38	0.00	36.52	74.78	2.00	0.00	0.38	0.00
36.58	71.63	2.00	0.00	0.38	0.00	36.64	68.47	2.00	0.00	0.38	0.00
36.70	66.00	2.00	0.00	0.38	0.00	36.76	64.43	2.00	0.00	0.38	0.00
36.83	64.01	2.00	0.00	0.38	0.00	36.88	63.85	2.00	0.00	0.37	0.00
37.01	63.46	2.00	0.00	0.37	0.00	37.06	62.32	2.00	0.00	0.37	0.00
37.14	62.53	2.00	0.00	0.37	0.00	37.24	63.34	2.00	0.00	0.37	0.00
37.32	65.29	2.00	0.00	0.37	0.00	37.37	66.36	2.00	0.00	0.37	0.00
37.42	67.55	2.00	0.00	0.37	0.00	37.50	68.61	2.00	0.00	0.36	0.00
37.54	69.92	2.00	0.00	0.36	0.00	37.60	71.95	2.00	0.00	0.36	0.00
37.66	74.69	2.00	0.00	0.36	0.00	37.72	77.95	2.00	0.00	0.36	0.00
37.79	81.15	2.00	0.00	0.36	0.00	37.85	82.83	2.00	0.00	0.36	0.00
37.91	81.86	2.00	0.00	0.36	0.00	37.98	78.48	2.00	0.00	0.36	0.00
38.03	75.45	2.00	0.00	0.36	0.00	38.09	74.55	2.00	0.00	0.35	0.00
38.16	75.54	2.00	0.00	0.35	0.00	38.21	76.70	2.00	0.00	0.35	0.00
38.28	77.01	2.00	0.00	0.35	0.00	38.34	76.75	2.00	0.00	0.35	0.00
38.39	74.28	2.00	0.00	0.35	0.00	38.52	70.42	2.00	0.00	0.35	0.00
38.59	66.28	2.00	0.00	0.35	0.00	38.65	64.30	2.00	0.00	0.34	0.00
38.70	63.90	2.00	0.00	0.34	0.00	38.77	63.85	2.00	0.00	0.34	0.00
38.83	64.41	2.00	0.00	0.34	0.00	38.90	65.67	2.00	0.00	0.34	0.00
38.96	66.63	2.00	0.00	0.34	0.00	39.01	66.52	2.00	0.00	0.34	0.00
39.09	64.59	2.00	0.00	0.34	0.00	39.19	62.43	2.00	0.00	0.34	0.00
39.26	60.84	2.00	0.00	0.33	0.00	39.31	60.46	2.00	0.00	0.33	0.00
39.44	61.38	2.00	0.00	0.33	0.00	39.50	63.20	2.00	0.00	0.33	0.00
39.56	64.92	2.00	0.00	0.33	0.00	39.62	67.72	2.00	0.00	0.33	0.00
39.66	72.57	2.00	0.00	0.33	0.00	39.73	78.74	2.00	0.00	0.33	0.00
39.79	84.16	2.00	0.00	0.33	0.00	39.86	87.46	2.00	0.00	0.32	0.00
39.92	89.67	2.00	0.00	0.32	0.00	39.99	90.88	2.00	0.00	0.32	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
40.04	91.59	2.00	0.00	0.32	0.00	40.17	91.31	2.00	0.00	0.32	0.00
40.23	90.58	2.00	0.00	0.32	0.00	40.29	89.82	2.00	0.00	0.32	0.00
40.35	89.89	2.00	0.00	0.32	0.00	40.42	91.11	2.00	0.00	0.31	0.00
40.47	93.29	2.00	0.00	0.31	0.00	40.53	95.71	2.00	0.00	0.31	0.00
40.60	97.82	2.00	0.00	0.31	0.00	40.66	99.23	2.00	0.00	0.31	0.00
40.71	100.13	2.00	0.00	0.31	0.00	40.79	100.26	2.00	0.00	0.31	0.00
40.84	100.06	2.00	0.00	0.31	0.00	40.89	99.39	2.00	0.00	0.31	0.00
40.97	98.49	2.00	0.00	0.31	0.00	41.02	97.00	2.00	0.00	0.30	0.00
41.10	95.45	2.00	0.00	0.30	0.00	41.14	94.00	2.00	0.00	0.30	0.00
41.21	93.52	2.00	0.00	0.30	0.00	41.28	91.02	2.00	0.00	0.30	0.00
41.34	86.19	2.00	0.00	0.30	0.00	41.46	79.87	2.00	0.00	0.30	0.00
41.53	74.65	2.00	0.00	0.30	0.00	41.59	71.56	2.00	0.00	0.30	0.00
41.64	68.62	2.00	0.00	0.29	0.00	41.68	65.84	2.00	0.00	0.29	0.00
41.76	62.84	2.00	0.00	0.29	0.00	41.81	59.05	2.00	0.00	0.29	0.00
41.89	56.46	2.00	0.00	0.29	0.00	41.94	53.89	2.00	0.00	0.29	0.00
42.00	52.52	2.00	0.00	0.29	0.00	42.07	50.56	2.00	0.00	0.29	0.00
42.19	49.14	2.00	0.00	0.28	0.00	42.24	48.05	2.00	0.00	0.28	0.00
42.30	47.19	2.00	0.00	0.28	0.00	42.37	46.63	2.00	0.00	0.28	0.00
42.42	46.00	2.00	0.00	0.28	0.00	42.48	45.40	2.00	0.00	0.28	0.00
42.56	45.05	2.00	0.00	0.28	0.00	42.60	44.77	2.00	0.00	0.28	0.00
42.68	44.89	2.00	0.00	0.28	0.00	42.74	44.57	2.00	0.00	0.28	0.00
42.87	43.89	2.00	0.00	0.27	0.00	42.91	42.77	2.00	0.00	0.27	0.00
42.99	41.97	2.00	0.00	0.27	0.00	43.04	41.57	2.00	0.00	0.27	0.00
43.10	41.47	2.00	0.00	0.27	0.00	43.17	41.38	2.00	0.00	0.27	0.00
43.22	41.26	2.00	0.00	0.27	0.00	43.30	41.17	2.00	0.00	0.27	0.00
43.35	40.93	2.00	0.00	0.27	0.00	43.41	40.61	2.00	0.00	0.26	0.00
43.53	40.19	2.00	0.00	0.26	0.00	43.58	39.50	2.00	0.00	0.26	0.00
43.71	39.41	2.00	0.00	0.26	0.00	43.77	42.73	2.00	0.00	0.26	0.00
43.83	47.77	2.00	0.00	0.26	0.00	43.93	52.38	2.00	0.00	0.26	0.00
44.01	54.53	2.00	0.00	0.25	0.00	44.06	55.25	2.00	0.00	0.25	0.00
44.10	55.22	2.00	0.00	0.25	0.00	44.17	55.03	2.00	0.00	0.25	0.00
44.26	55.87	2.00	0.00	0.25	0.00	44.30	56.36	2.00	0.00	0.25	0.00
44.39	55.52	2.00	0.00	0.25	0.00	44.43	53.43	2.00	0.00	0.25	0.00
44.52	52.36	2.00	0.00	0.25	0.00	44.62	52.86	2.00	0.00	0.24	0.00
44.66	53.58	2.00	0.00	0.24	0.00	44.70	54.88	2.00	0.00	0.24	0.00
44.79	55.92	2.00	0.00	0.24	0.00	44.84	54.95	2.00	0.00	0.24	0.00
44.96	52.52	2.00	0.00	0.24	0.00	45.01	49.36	2.00	0.00	0.24	0.00
45.07	47.88	2.00	0.00	0.24	0.00	45.13	46.57	2.00	0.00	0.24	0.00
45.19	45.52	2.00	0.00	0.23	0.00	45.25	45.26	2.00	0.00	0.23	0.00
45.31	45.94	2.00	0.00	0.23	0.00	45.37	51.44	2.00	0.00	0.23	0.00
45.49	56.25	2.00	0.00	0.23	0.00	45.54	63.78	2.00	0.00	0.23	0.00
45.62	70.58	2.00	0.00	0.23	0.00	45.68	78.07	2.00	0.00	0.23	0.00
45.73	83.95	2.00	0.00	0.22	0.00	45.81	86.82	2.00	0.00	0.22	0.00
45.85	89.09	2.00	0.00	0.22	0.00	45.92	89.65	2.00	0.00	0.22	0.00
46.03	90.16	2.00	0.00	0.22	0.00	46.08	91.51	2.00	0.00	0.22	0.00
46.21	94.24	2.00	0.00	0.22	0.00	46.26	98.74	2.00	0.00	0.22	0.00
46.33	103.22	2.00	0.00	0.21	0.00	46.38	108.11	2.00	0.00	0.21	0.00
46.46	112.15	0.32	0.45	0.21	0.00	46.51	114.93	0.34	0.44	0.21	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

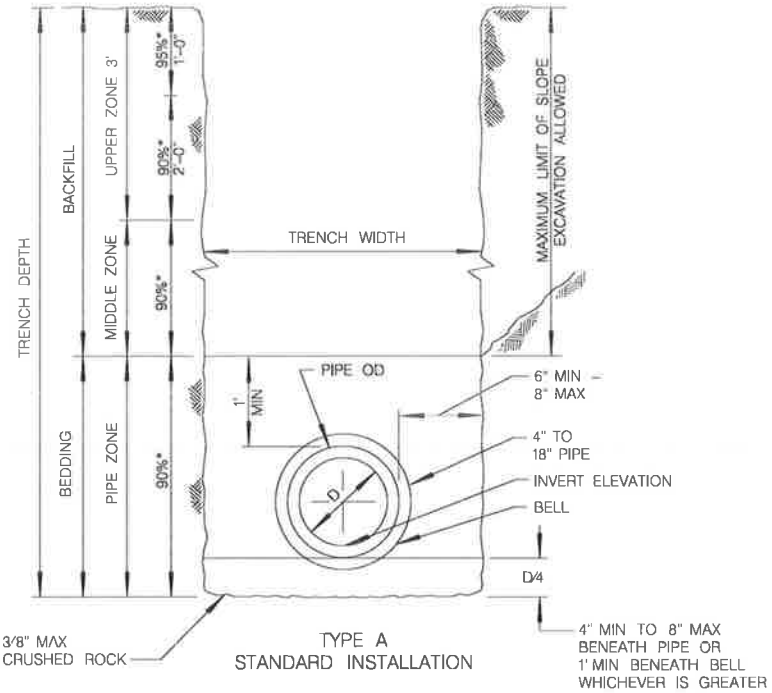
Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
46.56	116.28	0.34	0.44	0.21	0.00	46.65	113.26	0.33	0.44	0.21	0.00
46.75	108.86	0.30	0.45	0.21	0.01	46.82	105.21	0.29	0.46	0.21	0.00
46.87	105.42	0.29	0.46	0.21	0.00	46.94	107.56	0.30	0.45	0.20	0.00
47.00	109.51	0.31	0.44	0.20	0.00	47.07	109.44	0.31	0.44	0.20	0.00
47.09	108.77	0.30	0.44	0.20	0.00	47.12	106.60	0.29	0.45	0.20	0.00
47.24	105.60	0.29	0.45	0.20	0.01	47.31	105.15	0.29	0.44	0.20	0.00
47.36	105.54	0.29	0.44	0.20	0.00	47.41	105.89	0.29	0.44	0.20	0.00
47.48	106.33	0.29	0.43	0.20	0.00	47.53	106.43	0.29	0.43	0.19	0.00
47.61	105.84	0.29	0.43	0.19	0.00	47.66	104.89	0.29	0.43	0.19	0.00
47.74	104.46	0.28	0.43	0.19	0.00	47.84	105.52	0.29	0.42	0.19	0.00
47.88	106.91	0.30	0.42	0.19	0.00	47.95	107.87	0.30	0.41	0.19	0.00
48.01	108.32	0.30	0.41	0.19	0.00	48.06	108.34	0.30	0.41	0.19	0.00
48.11	107.91	0.30	0.41	0.18	0.00	48.19	107.25	0.30	0.40	0.18	0.00
48.24	105.60	0.29	0.41	0.18	0.00	48.32	103.49	0.28	0.41	0.18	0.00
48.37	102.06	0.27	0.41	0.18	0.00	48.44	102.10	0.28	0.41	0.18	0.00
48.50	102.25	0.28	0.41	0.18	0.00	48.56	101.36	0.27	0.41	0.18	0.00
48.63	99.55	0.26	0.41	0.18	0.00	48.72	98.62	0.26	0.41	0.17	0.00
48.81	98.58	0.26	0.41	0.17	0.00	48.86	99.31	0.26	0.40	0.17	0.00
48.91	100.01	0.27	0.40	0.17	0.00	48.99	99.51	0.26	0.40	0.17	0.00
49.03	99.34	0.26	0.40	0.17	0.00	49.17	98.50	0.26	0.39	0.17	0.01
49.21	98.98	0.26	0.39	0.17	0.00	49.30	98.16	0.26	0.39	0.16	0.00
49.34	98.13	0.26	0.39	0.16	0.00	49.36	97.93	0.26	0.39	0.16	0.00
49.42	98.77	0.26	0.38	0.16	0.00	49.51	99.02	0.26	0.38	0.16	0.00
49.55	99.61	0.27	0.38	0.16	0.00	49.64	99.97	0.27	0.37	0.16	0.00
49.69	100.90	0.27	0.37	0.16	0.00	49.80	101.36	0.27	0.36	0.16	0.00
49.86	101.62	0.28	0.36	0.15	0.00	49.90	101.33	0.27	0.36	0.15	0.00
50.00	101.27	0.27	0.35	0.15	0.00	50.06	101.29	0.27	0.35	0.15	0.00

Total estimated settlement: 0.22

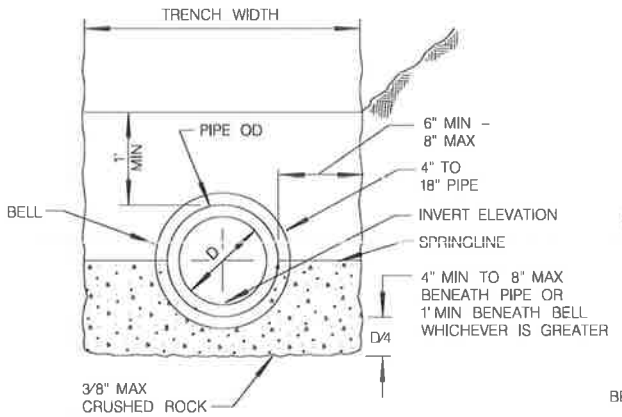
Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

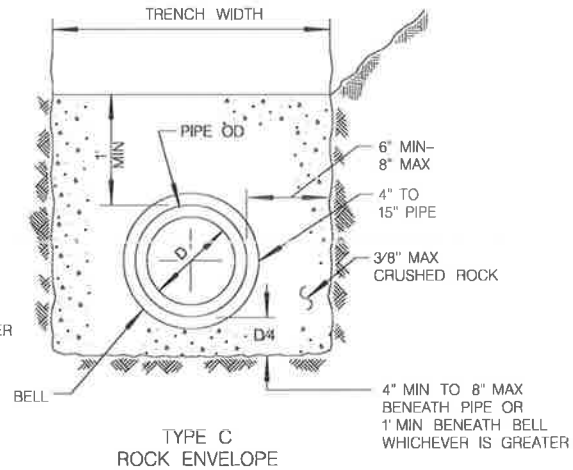
APPENDIX E



TYPE A
STANDARD INSTALLATION



TYPE B
ROCK TO SPRINGLINE



TYPE C
ROCK ENVELOPE

NOTES

1. FOR TRENCH RESURFACING IN IMPROVED STREETS, SEE STANDARD DRAWINGS SDG–107 AND SDG–108.
2. (*) INDICATES MINIMUM RELATIVE COMPACTION.
3. MINIMUM DEPTH OF COVER FROM THE TOP OF PIPE TO FINISH GRADE FOR PVC SDR 35 SEWER MAIN SHALL BE 5'. FOR SHALLOWER DEPTH, SPECIAL DESIGN IS REQUIRED. SEE SDS–101.
4. SEE TYPE A INSTALLATION FOR DETAILS NOT SHOWN FOR TYPES B AND C.
5. FOR PIPE SIZE ENCASEMENT LARGER THAN 15", MAXIMUM SIDE WALL CLEARANCE SHALL BE 12" OR AS SHOWN ON THE PLANS.
6. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
7. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.

From: City of San Diego Standard Drawing SDS-110 (2016)

LANDMARK Geo-Engineers and Geologists **Project No.: LE20178**	**Pipe Bedding and Trench Backfill Recommendations**	**Plate E-1**

Attachment "F"

Phase I Environmental Site Assessment

Heber Meadows
185 Willowbrook Way
Heber, California 92249

October 28, 2021

Prepared For:

Chelsea Investment Corporation
6337 Paseo del Lado
Carlsbad, CA 92011

Project Number 21-10-025

Prepared by:

Weis Environmental, LLC
1938 Kellogg Avenue, Suite 116
Carlsbad, CA 92008
(760) 585-7070
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Weis ENVIRONMENTAL

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October 28, 2021

Arnold López
Chelsea Investment Corporation
6339 Paseo Del Lago
Carlsbad, CA 92011

Subject: Phase I Environmental Site Assessment
Heber Meadows
185 Willowbrook Way
Heber, California 92249

Dear Mr. Lopez:

Weis Environmental, LLC has completed the contracted environmental consulting services for the above-referenced project. The services were performed in accordance with our proposal and agreement fully executed by all parties. The Phase I Environmental Site Assessment has been performed in accordance with ASTM International (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, ASTM Designation E1527-13 and Title 40 of the Code of Federal Regulations (40 CFR) Part 312. We appreciate the opportunity to be of service to you on this project. Please contact us if you have any questions or comments regarding this report or if we can be of further assistance.

Sincerely,

Weis Environmental, LLC

Daniel Weis, R.E.H.S.
Environmental Manager

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FIGURES

APPENDICES

1.0 INTRODUCTION

This report presents the methods and findings of a Phase I Environmental Site Assessment (ESA) of the property identified as Heber Meadows and located at 185 Willowbrook Way in Heber, Imperial County, California (Site) performed in conformance with the contract/agreement for this assignment and the scope and limitations of ASTM Standard Practice E1527-13 and United States Environmental Protection Agency (EPA) Standards and Practices for All Appropriate Inquiries (AAI) as published in 40 Code of Federal Regulations (CFR) Part 312. EPA promulgated the AAI rule that became effective in November 2006 and has indicated that the ASTM E1527 practice is consistent with the requirements of AAI and may be used to comply with the provisions of the AAI rule.

1.1 Purpose

The purpose of the ASTM E1527 practice (framework for this Phase I ESA) is to define good commercial and customary practice in the United States of America for conducting an ESA of a parcel of real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (Title 42 United States Code (U.S.C.) Section 9601)) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the "landowner liability protections," or "LLPs"): that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice as defined at 42 U.S.C. Section 9601(35)(B).

In defining a standard of good commercial and customary practice for conducting this Phase I ESA of the Site, the goal of the processes established by the ASTM E1527 practice is to identify, to the extent feasible, recognized environmental conditions. The term recognized environmental conditions is defined as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. In addition, controlled recognized environmental conditions, historical recognized environmental conditions and/or de minimis conditions, if identified during the completion of the assessment, are discussed herein. Definitions of these terms and other key terminology relevant to the practice are included in Section 14.0 of this report.

1.2 Scope of the Assessment

In general terms, this Phase I ESA included the acquisition of readily available/accessible and practically reviewable regulatory records and historical information, a site reconnaissance, interviews, and preparation of this written report of findings. A more detailed description of the four primary components of the Phase I ESA is presented below.

Records Review - A review of Federal, State, Tribal, and local standard ASTM and non-ASTM regulatory databases for a myriad of environmental identifiers including but not limited to properties with underground storage tanks (USTs), properties with leaking USTs, properties that have reported spills/releases that did not occur from a leaking UST, businesses that utilize hazardous materials and/or generate hazardous waste and hazardous waste disposal locations. The regulatory review may also include public records requests with one or more Federal, State, Tribal and/or local agencies. A review

of historical sources is also completed to help ascertain previous land uses of the property in question and in the surrounding area.

Site Reconnaissance - A property inspection and viewing of adjacent and surrounding properties for conditions that could be recognized environmental conditions.

Interviews - Interviews with present and past owners, operators and/or occupants of a property and local government officials.

Reporting - Evaluation of the information gathered during the completion of the Phase I ESA and the subsequent preparation of a written report.

1.3 Limitations and Exceptions

Concerns regarding liability under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq. (CERCLA) and analogous State laws, have been a primary driver for Phase I ESA assignments in commercial real estate transactions. While the ASTM E1527 practice can be used in many contexts, a familiarity with CERCLA and its potential LLPs is critical in understanding and applying the ASTM E1527 practice. We advise consultation with legal counsel if further inquiry or information is desired.

AAI represents the minimum level of inquiry necessary to support the LLPs. However, it is important to understand that additional inquiry ultimately may be necessary or desirable for legal as well as business reasons depending upon the outcome of this inquiry and the particular risk tolerances of a given user. For example, additional inquiry may assist a user of a Phase I ESA in determining whether he or she would have continuing obligations in the event he or she acquires a given property and may also assist the user in defining the scope of future steps to be taken to satisfy such obligations. In addition, a user may be concerned about business environmental risks or non-scope ASTM considerations that do not fall within the definition of a recognized environmental condition. In addition, this assessment did not include subsurface or other invasive exploration. Users are also cautioned that Federal, State, Tribal and local laws may impose environmental assessment obligations that are beyond the scope of the ASTM E1527 practice.

The evaluation, opinion and conclusions presented herein are based solely on visual observations and regulatory, historical, and personal knowledge related information that existed at the time our assessment was completed. The use of the gathered information is exclusively for the purposes outlined in this report and only for the Site. Our firm can make no warranty, either express or implied, except that the services conducted were performed in accordance with generally accepted environmental assessment practices applicable at the time and location of the assessment and that the conclusions of the assessment have been based in part on professional judgment/experience, an interpretation of readily available data and the standard of care normally followed by similar professionals practicing in a similar locale and under similar circumstances. Any opinions presented cannot apply to Site changes of which our firm is unaware and has not had the opportunity to evaluate. In addition, this report cannot feasibly include any evaluation of undocumented activities at the Site or on adjacent or nearby properties. Lastly, a Phase I ESA meeting or exceeding this practice and completed less than 180 days prior to the date of acquisition of a given property or (for transactions not involving an acquisition) the date of the intended transaction is presumed to be valid.

1.4 Special Terms and Conditions

This Phase I ESA was prepared in accordance with the terms and conditions of the contract/agreement for the work as executed between our firm and the client. There are no other special terms and conditions established between our firm and the client pertinent to the findings of this ESA or methodology used to complete this assessment. In addition, our firm has no final or other vested interest in the Site or adjacent/surrounding properties, or in any entity that owns or occupies the Site or adjacent/surrounding properties.

1.5 Limiting Conditions and Deviations

There were no significant limiting conditions that would inhibit our ability to identify recognized environmental conditions noted during the completion of this assessment. In addition, there were no deviations from the ASTM E1527 standard noted during the completion of this assessment. Any limiting conditions that are not considered to be ones that would inhibit our ability to identify recognized environmental conditions at the Site are referenced in applicable sections of this report.

1.6 Data Failure and Data Gaps

No instances of data failure were encountered during the completion of this assessment. In addition, no data gaps of significance (i.e. those that would inhibit our ability to identify recognized environmental conditions) were identified during the completion of this assessment. Any data gaps that are not considered to be ones that would inhibit our ability to identify recognized environmental conditions at the Site are referenced in applicable sections of this report.

1.7 Reliance

This report has been prepared for the exclusive use of our client. This report may not be relied upon by any other person or entity without the written consent of both our firm and our client. The scope of services performed for this assessment may not be appropriate to satisfy the specific needs of other users, and any use or reuse of this document would be at the sole risk of said users. Any other party seeking liability protection under CERCLA must take independent action to accomplish its objective.

2.0 SITE DESCRIPTION

2.1 Location and Legal Description

The Site is identified by the legal address of 185 Willowbrook Way in Heber, California and Imperial County Assessor's Parcel Number 054-601-016-000. The Site is a reported 16.06 acres and is situated to the east of Bloomfield Street, west of Pitzer Road, north of Littlefield Street and south of E Correll Road. A Vicinity Map is included as Figure 1. A Site Plan is included as Figure 2.

2.2 Site and Vicinity Characteristics

The Site and the surrounding vicinity are situated in Heber California in an area consisting primarily of agricultural properties, vacant land, residential properties, and public roadways. Additional details pertaining to the Site and its adjoining properties are provided in the sections below.

2.3 Current Use of the Site

The Site is vacant and undeveloped land.

2.4 Description of Site Improvements

There are no habitable structures present at the Site. Indicators of various utility systems are present throughout the Site, both visibly above grade and by way of surface features associated with subsurface systems. The nature of each of the features at the Site is unknown and cannot be ascertained by visual evaluation. A higher level of confidence regarding the nature of extent of any subsurface features can be obtained from a utility or geophysical consultant.

2.5 Utilities

Utilities that are reported to be present at the Site or provide service in the surrounding area are noted below along with their municipal provider where applicable. If certain utility systems are not provided by public agencies or entities, they are noted as privately maintained.

Utility	Provider (Where Applicable)
Potable Water	Heber Public Utility
Sewage Maintenance	Heber Public Utility
Electrical	San Diego Gas and Electric
Natural Gas	San Diego Gas and Electric
Solid Waste Disposal	CR & R Services

2.6 Description of Adjoining Properties

Adjoining properties are defined as any real property or properties, the border of which is contiguous or partially contiguous with that of the subject property of a Phase I ESA, or that would be contiguous or partially contiguous with that of a subject property but for a street, road, or other public thoroughfare separating them. To the extent feasible, our firm performed a visual inspection of adjoining properties from the Site boundaries and along public right of ways. We did not encroach on to adjoining private

property during the completion of this assessment. The following table identifies the adjoining property uses:

Direction	Adjoining Property Use
North	E Correll Road, then agricultural land.
South	Residential properties, Littlefield Way and vacant land.
East	Pitzer Road, then agricultural land.
West	Bloomfield Street, then retention basin.

2.7 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the land use of the Site and improvements at the Site. In addition, the land uses of adjoining properties and properties in the vicinity of the Site do not represent recognized environmental conditions to the Site.

3.0 PHYSICAL SETTING

3.1 Topography

The Site is depicted on the United States Geological Survey (USGS) topographic map for the Heber, California 7.5-minute quadrangle. The Site is shown on the map as being situated at an elevation of approximately 15 feet below mean sea level. The Site and surrounding area appear to trend slightly to the west and southwest. There are no improvements, structures or surface waters depicted on-Site on the map. Adjoining and surrounding roadways are depicted on the map. The Site as depicted on a topographic map is included as Figure 3.

3.2 Hydrology

The Site is situated within the Brawley Hydrologic Area of the Imperial Hydrologic Unit. There are no known substantial hydrologic features at the Site including major storm drain inlets, drainages, channels or surface waters. Surface drainage at the Site is facilitated by nearby municipal storm drains along public roadways and maintained by the local municipality. Infiltration of precipitation can be expected at the Site due to its unimproved nature. Any excess water would appear to flow as surface runoff to surrounding areas of lower elevation and storm drains.

3.3 Geology

General geologic information pertaining to the Site is presented in the table below.

Geologic Consideration	Details
California Geomorphic Province	Colorado Desert.
Mapped Soils or Formation	Alluvium, lake, playa and terrace deposits.
Description of Soils or Formation	Generally described as sands, silts, clays and gravels.
Distance/Direction to Mapped Faults	No know faults are mapped on the Site.

3.4 Hydrogeology

General hydrogeologic information pertaining to the Site is presented in the table below.

Hydrogeologic Consideration	Details
Groundwater Basin or Unit	Imperial Hydrologic Unit.
Beneficial Uses	Municipal and agricultural.
Estimated Depth to Groundwater	Approximately 10 feet and greater below the surface.
Estimated Flow of Groundwater	West and southwest.

Hydrogeologic Consideration	Details
Known Site or Regional Groundwater Contamination Issues	None.

3.5 Oil and Gas Exploration

According to online resources provided by the California Department of Conservation, Geologic Energy Management Division (CalGEM), there are no oil, gas or geothermal wells located on the Site or its adjacent properties. The Site is located within the Heber oil/gas field. If any methane or other sub-slab mitigation systems are required due to the Site being located in the Heber oil/gas field, it is assumed that such a directive would be issued by the building permitting authority for the project.

3.6 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with Site physical setting considerations. In addition, physical setting considerations related to the adjoining properties and properties in the vicinity of the Site do not represent recognized environmental conditions to the Site.

4.0 USER PROVIDED INFORMATION

A representative of the user of this report (Chelsea Investment Corporation) was interviewed during the completion of this assessment. The questions posed during the interview are defined by the ASTM E1527 practice. The client also provided our firm with any land title records and judicial records that may be available for the Site as part of the required evaluation for environmental liens and activity and use limitations (AULs) in connection with the subject property of a Phase I ESA. As stated in the ASTM E1527 practice, it is the responsibility of the user of the report to provide any available records pertaining to environmental liens and AULs that may exist in connection with a given property. Any land title and judicial recorded provided to our firm are discussed below. If such information is not discussed in the sections below, it was not provided by the user of the report.

In addition to the contact information obtained, the user of the report was also asked if they are aware of other useful documents that may exist and if so whether copies can be provided to the environmental professional within reasonable time and cost constraints. A list of typical useful documents is included in Section 10.8.1 of the ASTM E1527 practice and include but are not limited to environmental assessment reports, compliance audits and permits, registrations for tank and other aboveground or underground systems, safety plans, spill prevention and other facility related plans and geological/geotechnical studies and environmental governmental agency notices and/or correspondence.

4.1 Title Records

Our firm was provided with a preliminary title report for the Site dated April 8, 2021 and prepared by First American Title Company. According to the report, the Site is vested in Heber Meadows Land Holding LLC, a California Limited Liability Company. No environmentally related liens, deed restrictions or activity and use limitations pertaining to the Site were noted in the title report. A copy of the title report is included as Appendix A.

4.2 Environmental Liens

The client is unaware of environmental liens in connection with the Site.

4.3 Activity and Use Limitations

The client is unaware of AULs in connection with the Site.

4.4 Specialized or Actual Knowledge or Experience

The client is unaware of specialized knowledge, actual knowledge or experience that is material to recognized environmental conditions in connection with the Site.

4.5 Commonly Known or Reasonably Ascertainable Information

The client is unaware of commonly known or reasonably ascertainable information within the local community that is material to recognized environmental conditions in connection with the Site.

4.6 Valuation Reduction for Environmental Issues

The client is unaware of information pertaining to an undervalued purchase price of the Site relative to the estimated fair market value of the Site due to the presence of contamination.

4.7 Owner, Property Manager, and Occupant Information

The Site is currently owned and managed by the Heber Meadows Land Holding LLC, a California Limited Liability Company. The Site is vacant with no known occupants.

4.8 Reason for Performing Phase I ESA

The client has commissioned this Phase I ESA as part of the planned development of the Site for residential purposes. The Phase I ESA is also being completed to assist the client in complying with 40 CFR Part 312.

4.9 Proceedings Involving the Site

The client is unaware of pending, threatened, or past litigation and administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the Site. The client is also unaware of notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products in connection with the Site.

4.10 Other Provided Documents

A prior Phase I ESA pertaining to the Site, prepared by others and dated July 2, 2020 was provided to our firm. At the time of the assessment, the Site was in a similar configuration to the present. Soil sampling and analysis was conducted concurrent with the completion of the 2020 Phase I ESA. Ten soil samples were obtained (five in-place and five from stockpiles). The samples were analyzed for arsenic and organochlorine pesticides (OCPs). Arsenic concentrations were considered to be within the range of what would be considered to be naturally occurring. Trace concentrations of OCPs were detected in each of the samples. The OCP detections were below residential human health risk based screening levels. It was concluded that no further soil sampling was necessary and that no recognized environmental conditions were identified in connection with the Site.

4.11 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the user provided information.

5.0 REGULATORY RECORDS REVIEW

Our firm commissioned the preparation of a regulatory database report from Environmental Risk Information Services (ERIS) as part of the regulatory records review. ERIS searches a myriad of Federal, State, and local government environmental databases during the preparation of their deliverables. Certain databases are specifically required by the ASTM E1527 practice and are referenced as "standard ASTM regulatory databases." Such databases are searched to at least the minimum search distance around a given property as defined in the practice. Other regulatory databases are also searched that are not specifically referenced in ASTM E1527. Such databases are referenced as "non-ASTM regulatory databases" and are searched as varying radii around a given property as selected by ERIS.

Descriptions of each database searched and the dates that the regulatory databases were last updated by the applicable agencies are included in the ERIS report. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of an updates. ERIS updates databases in accordance with ASTM E1527 which states that government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public.

Our firm also reviewed unplottable sites listed in the database report by cross-referencing reasonably ascertainable information pertaining to such properties that may include facility names, street names, zip codes or other information. Unplottable sites are ones that cannot be formally mapped or geocoded due to various reasons, including limited geographic information. Any unplottable sites that we identify within the specified search radii have been evaluated as part of the preparation of this report. A copy of the regulatory database report is included in Appendix B.

5.1 Standard ASTM Regulatory Database Search

The tables below present the standard Federal, State, Tribal and local ASTM databases that were searched by ERIS including the search distances from the Site. Below the tables are descriptions of any listings for the Site that may appear in the databases. In addition, a discussion of adjoining properties or properties in the Site vicinity that are listed in one or more regulatory databases that in our professional judgment and opinion have the potential to adversely impact the Site due to current or former releases of hazardous substances and/or petroleum products that occurred at said properties is presented. This practice of discussing only properties of potential environmental concern to the Site is noted in ASTM E1527 which states that the environmental professional may make statements applicable to multiple properties listed in regulatory databases that are not likely to have current or former releases of hazardous substances and/or petroleum products with the potential to migrate to the a given subject property. Our professional judgment and opinions discussed herein are based on several factors including the nature of the regulatory database listings, distance of the off-Site listed properties from the Site, orientation of the listed properties relative to the Site, interpreted the direction of groundwater flow and/or regulatory case status information for the various properties as described in the databases.

The following Federal standard ASTM databases were searched:

Standard Environmental Record Source Name	ERIS Regulatory Database Identification	Search Distance From Site (Miles)
National Priorities List (NPL) Site List	NPL – Proposed NPL – Superfund Record of Decision (ROD)	1.0
Delisted NPL Site List	Deleted NPL	0.5
Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List	CERCLIS - SEMS – SEMS Archive – ODI – IODI – CERCLIS LIENS – SEMS LIENS	0.5
CERCLIS List	CERCLIS LIENS – SEMS LIENS	Site
CERCLIS No Further Remedial Action Planned (NFRAP) Site List	CERCLIS NFRAP	0.5
Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS) Facilities List	RCRA CORRACTS	1.0
RCRA Non-CORRACTS Treatment, Storage and Disposal (TSD) Facilities List	RCRA TSD	0.5
RCRA Generators List	RCRA LQG – RCRA SQG – RCRA CESQG – RCRA NON-GEN – RCRA VSQG - BULK TERMINAL – REFN – FEMA Underground Storage Tank (UST)	0.25
Institutional Control/Engineering Control Registries	FED ENG – FED INST – FED Brownfields	0.5
Emergency Response Notification System (ERNS) List	ERNS – ERNS 1982 to 1986 – ERNS 1987 to 1989	Site

Site – The Site is not listed on any of the standard Federal ASTM regulatory databases.

Adjoining Properties – One west adjoining property identified as Heber Public Utility District (1184 Rockwood Avenue) is listed on the RCRA NON GEN standard Federal ASTM regulatory database. The business has no reported violations and is not listed on databases indicative of releases of hazardous substances or petroleum products to the subsurface. This property is not considered to have the potential to adversely impact the Site.

Other Properties – There are three listings on the standard Federal ASTM regulatory databases pertaining to properties in the surrounding area that are identified on various databases including SEMS ARCHIVE (one listing), CERCLIS (one listing), and CERCLIS NFRAP (one listing). These properties are not considered to have the potential to adversely impact the Site.

The following State, Tribal and local standard ASTM databases were searched:

Standard Environmental Record Sources Name	ERIS Regulatory Database Identification	Search Distance From Site (Miles)
Equivalent NPL	RESPONSE	1.0

Standard Environmental Record Sources Name	ERIS Regulatory Database Identification	Search Distance From Site (Miles)
Equivalent CERCLIS	ENVIROSTOR – DELISTED ENVS – HWP - HHSS	0.5
Landfill and/or Solid Waste Disposal Site Lists	SWF/LF – LDS – SWAT – SWRCB SWF	0.5
Leaking Storage Tank Lists	LUST – DELISTED LST – UST CLOSURE – CLEANUP SITES – INDIAN LUST – DELISTED ILST	0.5
Registered Storage Tank Lists	UST – AST – DELISTED TNK – CERS TANK – DELISTED CTNK – HIST TANK – INDIAN UST – DELISTED IUST – DELISTED COUNTY – IMPERIAL CUPA	Site and Adjoining Properties
Institutional Control/Engineering Control Registries	LUR – HLUR - DEED	Site
Voluntary Cleanup Sites	VCP	0.5
Brownfield Sites	Not Applicable – No Database Exists	0.5

Site – The Site is not listed on any of the State, Tribal and local standard ASTM regulatory databases.

Adjoining Properties – Two adjoining properties are listed on the State, Tribal and local standard ASTM regulatory databases as described below:

- **Heber Public Utility District** (1184 Rockwood Ave) - This west adjoining property is listed on the IMPERIAL CUPA and CERS TANKS databases pertaining to the permitted use of aboveground petroleum storage tanks. There are minor administrative related violations reported for the business that were reportedly returned to compliance. This property is not listed on databases indicative of releases of hazardous substances or petroleum products to the subsurface. This property is not considered to have the potential to adversely impact the Site.
- **AT&T Corp** (1190 Rockwood Road) – This west adjoining property is listed as on the IMPERIAL CUPA database. No additional information is provided. This property is not listed on databases indicative of releases of hazardous substances or petroleum products to the subsurface. This property is not considered to have the potential to adversely impact the Site.

Other Properties – There are three listings on the State, Tribal and local standard ASTM regulatory databases pertaining to properties in the surrounding area that are identified on various databases including ENVIROSTOR (two listings) and CALSITES (one listing). None of these properties are considered to have the potential to adversely impact the Site.

5.2 Non-ASTM Regulatory Database Search

A myriad of non-ASTM regulatory databases was searched by ERIS as noted in the regulatory database report.

Site – The Site is not listed on any of the non-ASTM regulatory databases.

Adjoining Properties – No adjoining properties are listed on any of the non-ASTM regulatory databases.

Other Properties – No other properties are listed on any of the non-ASTM regulatory databases.

5.3 Regulatory Agency File Reviews

If a property being assessed under a Phase I ESA or any of the adjoining properties are identified on one or more of the above referenced standard environmental record sources, pertinent regulatory files and/or records associated with such listings should be reviewed to assist the environmental professional in evaluating if recognized environmental conditions existing at a given subject property in connection with any listings. However, if in the environmental professional's opinion, such a review is not warranted, file reviews need not be conducted if the environmental professional provides justification for not doing so.

Agency file reviews for the Site completed during this assessment are noted below. No file reviews for adjoining properties or properties in the surrounding area were deemed warranted with the exception of research completed on the State Water Resources Control Board Geotracker database regarding properties in the surrounding area of the Site. The agency inquiries were performed by way of on-line searches/queries of published databases and/or direct inquiries with public records clerks at one or more agencies.

Regulatory Agency	Jurisdiction	Date of Inquiry or Request	Contact	Response or Information From Agency
United States EPA Envirofacts/ECHO/ TRIS	Federal	10/25/2021	Online https://enviro.epa.gov/ https://echo.epa.gov/facilities/facility-search https://www.epa.gov/toxics-release-inventory-tri-program	No Records Identified
California Department of Toxic Substances Control	State	10/25/2021	Online https://www.envirostor.dtsc.ca.gov/public https://hwts.dtsc.ca.gov/report_list.cfm	No Records Identified
State Water Resources Control Board/Regional Water Quality Control Board	State	10/25/2021	Online https://geotracker.waterboards.ca.gov/ https://geotracker.waterboards.ca.gov/historical_ust_facilities	No Records Identified
Department of Toxic Substances Control Imperial Certified Unified Program Agency (DTSC Imperial CUPA)	Local	10/25/2021	Public Records Clerk	No Records Identified

Regulatory Agency	Jurisdiction	Date of Inquiry or Request	Contact	Response or Information From Agency
Imperial County Public Health Department, Division of Environmental Health	Local	10/25/2021	Public Records Clerk	No Records Identified

As shown in the table above, no records pertaining to the Site were identified.

5.4 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the regulatory records searches. In addition, regulatory resources related to the adjoining properties and properties in the vicinity of the Site do not represent recognized environmental conditions to the Site.

6.0 HISTORICAL RESOURCE REVIEW

The objective of consulting historical sources is to develop a history of the previous uses of a property and surrounding area, in order to help identify the likelihood of past uses having led to recognized environmental conditions in connection with a given property. The goal of the historical research is to identify all obvious uses of a subject property from the present, back to the property's first developed use, or back to 1940, whichever is earlier. The environmental professional exercises professional judgment in reviewing only as many of the standard historical sources referenced in ASTM E1527 that are deemed necessary, are reasonably ascertainable and are likely to be useful. Historical resources reviewed during the completion of this assessment are referenced below. Copies of the historical resources are included in Appendix C.

6.1 Aerial Photographs

We reviewed historical aerial photographs from the years 1952, 1969, 1976, 1979, 1984, 1996, 2002, 2009, 2012 and 2018 provided by Historic Information Gatherers. The table below presents the results of the photograph review.

Photograph Year	Site Observations	Adjoining Property Observations
1952-2002	The Site appears to be utilized for agricultural purposes.	Adjoining properties appear to be primarily utilized for agricultural purposes. Some roadways appear to be visible.
2009-2018	The Site appears to be in its current configuration (vacant and undeveloped land).	South adjoining properties appear to be residential development. Other adjoining properties appear similar to prior photographs. A retention basin appears to be west of the Site. Existing streets and roadways are visible.

As stated above, the Site has been previously used for agricultural purposes. During historical agricultural activities throughout the State of California, various pesticides and more specifically OCPs were commonly applied during the normal course of agricultural operations. Such compounds have since been banned from production and use in the United States. Based on the regulatory and historical research completed during the preparation of this assessment, no information has been revealed that would lead us to believe that an accidental spill or release of pesticide products has occurred at the Site. As such, the potential presence of residual agricultural chemicals in Site soils is not considered to be a recognized environmental condition in connection with the Site. In addition, prior soil sampling and analysis was completed at the Site (as described in Section 4.10) and no contaminants of concern were noted.

6.2 Other Historical Sources

Other historical sources are referenced in the ASTM E1527 practice as any source or sources other than the standard historical sources referenced in the practice that are credible to a reasonable person and that identify past uses of a subject property. This category includes, but is not limited to miscellaneous maps and directories, newspaper archives, internet sites, community organizations, local libraries, historical societies, current owners or occupants of neighboring properties, or records in the files and/or personal knowledge of the property owner and/or occupants. No historical sources other

than the standard sources described above were deemed necessary and useful to assist in identifying recognized environmental conditions.

6.3 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the historical resources reviewed. In addition, historical resources related to the adjoining properties and properties in the vicinity of the Site did not reveal recognized environmental conditions to the Site.

7.0 SITE RECONAISSANCE

The objective of the Site reconnaissance is to obtain information indicating the likelihood of identifying recognized environmental conditions in connection with a subject property. The Site visit for our assessment was completed on October 22, 2021 by Michelle Everitt of our firm. We were unaccompanied during the reconnaissance.

7.1 Methodology and Limiting Conditions

The Site reconnaissance consisted of observing the Site on foot via various transects and walking publicly accessible areas surrounding the Site. No significant limiting conditions of the Site inspection were noted. Select photographs of the Site obtained during the Site reconnaissance are included in Appendix D.

7.2 Current General Site and Vicinity Characteristics

The Site and the surrounding vicinity are situated in Heber California in an area consisting primarily of agricultural properties, vacant land, residential properties, and public roadways. The Site is vacant and undeveloped land. The current use of the Site and adjoining properties are not ones that are indicative of the use, treatment, storage disposal or generation of hazardous substances or petroleum products that may have significantly impacted the Site.

7.3 Indications of Past Site and Vicinity Uses

There are no material differences between the current and past uses of the Site, adjoining properties and the surrounding area Site that were visually and/or physically observed during the Site reconnaissance that pertain to recognized environmental conditions.

7.4 Site-Specific Observations

We examined the Site for the features and conditions noted in the table below.

Feature or Condition	Details
General Description of Structures	There are no habitable structures present at the Site. Indicators of various utility systems are present throughout the Site, both visibly above grade and by way of surface features associated with subsurface systems.
Drains and Sumps	None observed.
Heating/Cooling Systems	None observed.
Potable Water Supply	Heber Public Utility.
Roads	Access to the Site is from Bloomfield Street to the west, E Correll Road to the north, Pitzer Road to the east and Littlefield Way to the south.
Septic Systems / Sewage Disposal System	Heber Public Utility.
Wastewater and Stormwater Discharges	None observed.
Wells	None observed.

Feature or Condition	Details
Drums	None observed.
Electrical or Hydraulic Equipment Known to Contain PCBs or Likely to Contain PCBs	None observed.
Hazardous Substances and Petroleum Products in Connection with Identified Uses	None observed.
Hazardous Substance and Petroleum Products Not Necessarily in Connection With Identified Uses	None observed.
Odors	None noted.
Pits, Ponds or Lagoons	None observed.
Pools of Liquid	None observed.
Solid Waste (Including Fill Material)	Scattered trash and debris was observed in some areas of the Site. Such materials included concrete rubble, remnant plastic sheeting, paper products, wood fragments, automobile tires, landscape waste, pipe fragments, abandoned furniture, abandoned toilets and other miscellaneous materials. A few shipping containers are also present at the Site as are several piles of soil. No staining, odors or other suspect conditions were noted.
Stained Soil or Pavement	None observed.
Stains or Corrosion	None observed.
Chemical Storage Tanks	None observed.
Stressed Vegetation	None observed.
Unidentified Substance Containers	None observed.

7.5 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the current use of the Site during the Site reconnaissance. In addition, no current uses of the adjoining properties or properties in the surrounding area that were visually and/or physically observed during the Site reconnaissance were noted as recognized environmental conditions to the Site.

8.0 INTERVIEWS

8.1 Site Owner

The Site owner is unaware of environmental concerns in connection with the Site. A questionnaire completed by the Site owner is included in Appendix E.

8.2 Key Site Manager

The Site owner is also considered to be the Key Site Manager. Please refer to Section 8.1 above.

8.3 Current Occupants

The Site is vacant with no known occupants.

8.4 Local Government Official

During the preparation of this assessment, public records clerks with Imperial County and the State of California were contacted by our firm regarding the Site. Agency representatives indicated that public records requests should be conducted in order to obtain information known by the agencies regarding the Site. Public records requests were completed by our firm as described in Section 5.3.

8.5 Other Parties

Interviews with other persons were not conducted during the preparation of this assessment. As stated in the ASTM E1527 practice, interviews with past owners, operators, and occupants of a subject property who are likely to have material information regarding the potential for contamination at a given property shall be conducted to the extent that they have been identified and that the information likely to be obtained is not duplicative of information already obtained from other sources. Interviews with persons with past association with the Site were not deemed warranted during the completion of this assessment.

8.6 Summary Relative to Environmental Concerns

No recognized environmental conditions were noted in connection with the interviews completed during the assessment.

9.0 ADDITIONAL SERVICES – NON-SCOPE ASTM CONSIDERATIONS

No additional services as defined by ASTM were completed by our firm during the preparation of this assessment. Several non-scope ASTM considerations are referenced in the ASTM E1527 practice that a user of a report may wish to evaluate. Listed considerations in the practice include asbestos-containing building materials, biological agents, cultural and historic resources, ecological resources, health and safety, indoor air quality (unrelated to releases of hazardous substances or petroleum products into the environment), industrial hygiene, lead-based paint, lead in drinking water, mold, radon and regulatory compliance. No implication is intended by the practice as to the relative importance of inquiry into such non-scope considerations, and the list of considerations is not intended to be all-inclusive.

An evaluation of one or more of the non-scope considerations was not requested of our firm as part of the scope of services for the assessment. Therefore, no findings, opinions and conclusions of this assessment are based on said non-scope ASTM considerations.

10.0 FINDINGS AND OPINIONS

No features and/or conditions indicating the presence or likely presence of hazardous substances and/or petroleum products at the Site that are considered to have the potential to adversely impact the Site were identified during the completion of this assessment.

11.0 CONCLUSIONS AND RECOMMENDATIONS

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM International Practice E1527 of the Site located at 185 Willowbrook Way in Heber, Imperial County, California and (Imperial County Assessor's Parcel Number 054-601-016-000). Any exceptions to, or deletions from, this practice are described in Section 1.5 of this report. This assessment has revealed no evidence of recognized environmental conditions, controlled recognized environmental conditions or historical recognized environmental conditions in connection with the Site. Additional assessment at the Site is not considered to be warranted at this time.

12.0 ENVIRONMENTAL PROFESSIONAL STATEMENT

I declare that, to the best of my professional knowledge and belief, I meet the definition of environmental professional as defined in Section 312.10 of 40 CFR. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Site. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. Qualifications of personnel involved with the completion of this report are included in Appendix F.

Daniel Weis, R.E.H.S.
Environmental Manager

13.0 ASSUMPTIONS

No Phase I ESA effort can eliminate uncertainty regarding the potential for recognized environmental conditions to exist in connection with a given property. Performance of the ASTM E1527 practice may reduce such uncertainty but in no way should the findings and report be misconstrued as insurance or a guarantee regarding the potential for recognized environmental conditions in connection with a given property. The ASTM E1527 practice recognizes reasonable limits of time and cost relative to the completion of a Phase I ESA.

During the completion of this ESA, our firm relied on certain information obtained from secondary sources, including but not limited to the user of the report, government agencies, historical research business entities, environmental databases, and interviews with one or more persons. The sources obtained and/or consulted are assumed to be reliable. However, our firm cannot warranty or guarantee that the information provided by these other sources is wholly accurate or complete. Our firm is not responsible for any misrepresentations or false statements that may be provided by others or the lack of pertinent/relevant information that should have been provided/disclosed by others and we assume no responsibility for any consequence as a result of such omissions or withheld information.

Accuracy and completeness of records varies among information sources, including from governmental agencies. As a result, there is a possibility that even with the proper application of the methodologies presented in ASTM E1527, conditions may exist that could not be identified within the scope of this assessment or which were not reasonably identifiable from the available information. In addition, any responses received from Federal, State, Tribal, and local regulatory agency secondary sources of information after the issuance of this report may change certain findings and conclusions of this report.

Estimations and opinions regarding the potential for off-Site properties to adversely impact a given subject property is one of the key components of a Phase I ESA. In most cases, recent property-specific or adjacent-property specific measured groundwater data or other hydrogeological information is not reasonably ascertainable. In the absence of such data, reasonable assumptions regarding the depth and flow of groundwater are made based on various sources including comparisons to surface elevations, land topography and available hydrogeological on the State of California Geotracker database. In addition, estimations and opinions regarding potential impacts from off-Site locations may be based on certain assumptions that a hazardous substance or petroleum product may not migrate laterally within unsaturated soil for a substantial distance and that contaminants that have reached saturated soil and groundwater may attenuate over time and/or may decrease in concentration relative to distance from its source. While any interpretations presented herein may be effective in reducing uncertainty regarding potential impacts to a subject property from off-Site locations, in no way should the findings and report be misconstrued as insurance or a guarantee regarding the potential for such impacts to occur. Greater certainty regarding subsurface conditions at a given property can only be achieved by way of a subsurface sampling effort of one or more media.

14.0 DEFINITIONS

Definitions of key terminology relevant to the ASTM E1527 practice are presented below.

Recognized Environmental Condition - The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

Controlled Recognized Environmental Condition - A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

Data Failure - A failure to achieve the historical research objectives as outlined in the ASTM E1527 practice even after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

Data Gap - A lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by the ASTM E1527 practice, including, but not limited to site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.). Data gaps are only considered to be significant if they affect the ability of the environmental professional to identify recognized environmental conditions.

De Minimis Condition - A condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions.

Environment - (A) the navigable waters, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C. §§ 1801 et seq.], and (B) any other surface water, groundwater, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States.

Good Faith - The absence of any intention to seek an unfair advantage or to defraud another party; an honest and sincere intention to fulfill one's obligations in the conduct or transaction concerned.

Hazardous Substance - Includes hazardous substances designated under section 311 of the Clean Water Act (CWA) or Section 102 of CERCLA, any toxic pollutant listed under Section 307(a) of the CWA, any waste that has been listed as a RCRA hazardous waste or possesses a RCRA hazardous waste characteristic, any substance that is identified as a hazardous pollutant under Section 112 of the Clean Air Act (CAA), and any imminently hazardous chemical that EPA has taken action pursuant to Section 7 of the Toxic Substances Control Act (TSCA).

Historical Recognized Environmental Condition - A past release of any hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority or

meeting unrestricted use criteria established by a regulatory authority, without subjecting the property in question to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

Petroleum Exclusion – While the definition of a CERCLA hazardous substance specifically excludes petroleum products and crude oil, the EPA has determined that the petroleum exclusion applies to petroleum products such as gasoline and other fuels containing lead, benzene or other hazardous substances that are normally added during the refining process. Notwithstanding the existence of the petroleum exclusion, petroleum products are included within the scope of the ASTM E1527 practice for multiple reasons. Petroleum products have historically been widely used at commercial properties. In addition, other federal and state laws may impose liability for releases or spills of petroleum products.

Reasonably Ascertainable Information - Information that is (1) publicly available, (2) obtainable from its source within reasonable time and cost constraints and (3) practically reviewable.

Release or Threatened Release - Spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment (including the abandonment or discarding of barrels, containers and other closed receptacles containing any hazardous substance, or pollutant or contaminant).

15.0 REFERENCES

Sources of information consulted during the completion of our Phase I ESA are noted in the sections below.

15.1 Documents, Plans and Reports

- All Appropriate Inquiry" as necessary to satisfy the defenses available under 42 U.S.C. §§ 9607(b)(3), 9607(r)(1), and 9607(q), relying on definitions provided at 42 U.S.C. §§ 9601(35)(B); and as further explained in 40 CFR §§ 312.1 – 312.31.
- ASTM International, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM Designation E 1527-13, Published November 2013.
- California Geological Survey, 2002, California Geomorphic Provinces Note 36, Electronic Copy, Revised December.
- California State Water Resources Control Board, Water Quality Control Plan for the Imperial Valley Region (7), California, Published 2016.
- ERIS Database Report dated October 22, 2021.
- HIG Aerials Report provided by Prior Phase I ESA.
- USGS topographic map, Heber, California Quadrangle (2018).

15.2 Personal Communications

- Designated Client Representative – David Davis
- Designated Site Owner Representative – David Davis
- Key Site Manager – David Davis
- Public Records Clerk – Imperial County Public Health Department, Division of Environmental Health

15.3 Agencies Consulted

- California Department of Conservation, Geologic Energy Management Division (CalGEM)
- California Department of Toxic Substances Control
- California State Water Resources Control Board
- Imperial County
- United States EPA

FIGURES

FIGURE 1
VICINITY MAP

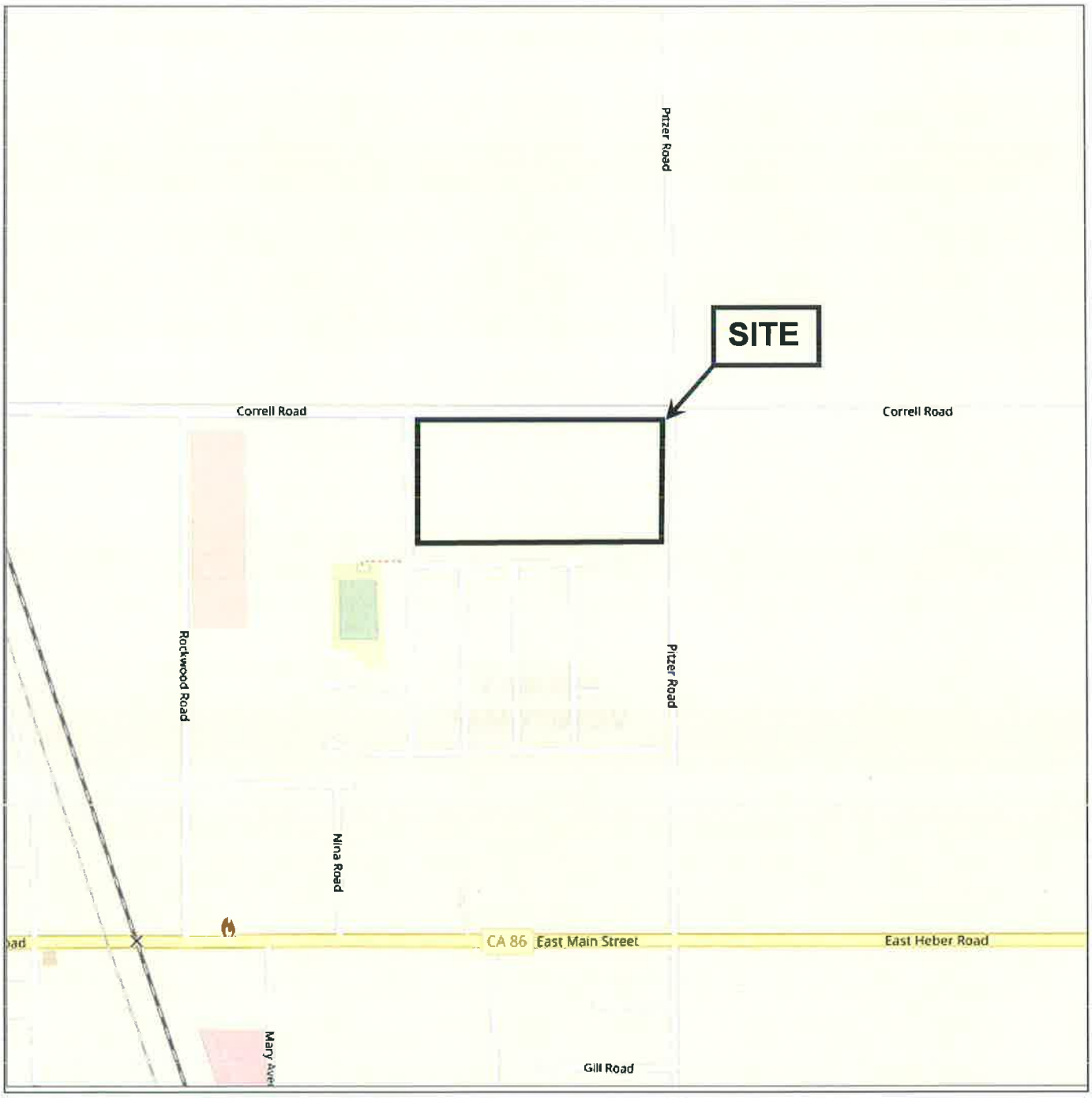


Figure 1 - Vicinity Map

185 Willowbrook Way
Heber, California

N

Prepared by:

Weis Environmental
1938 Kellogg Avenue, Suite 116
Carlsbad, CA 92008

Weis ENVIRONMENTAL

FIGURE 2
SITE PLAN

Figure 2 - Site Plan

185 Willowbrook Way
Heber, California

N

Prepared by:

Weis Environmental
1938 Kellogg Avenue, Suite 116
Carlsbad, CA 92008

Weis ENVIRONMENTAL

FIGURE 3
TOPOGRAPHIC MAP

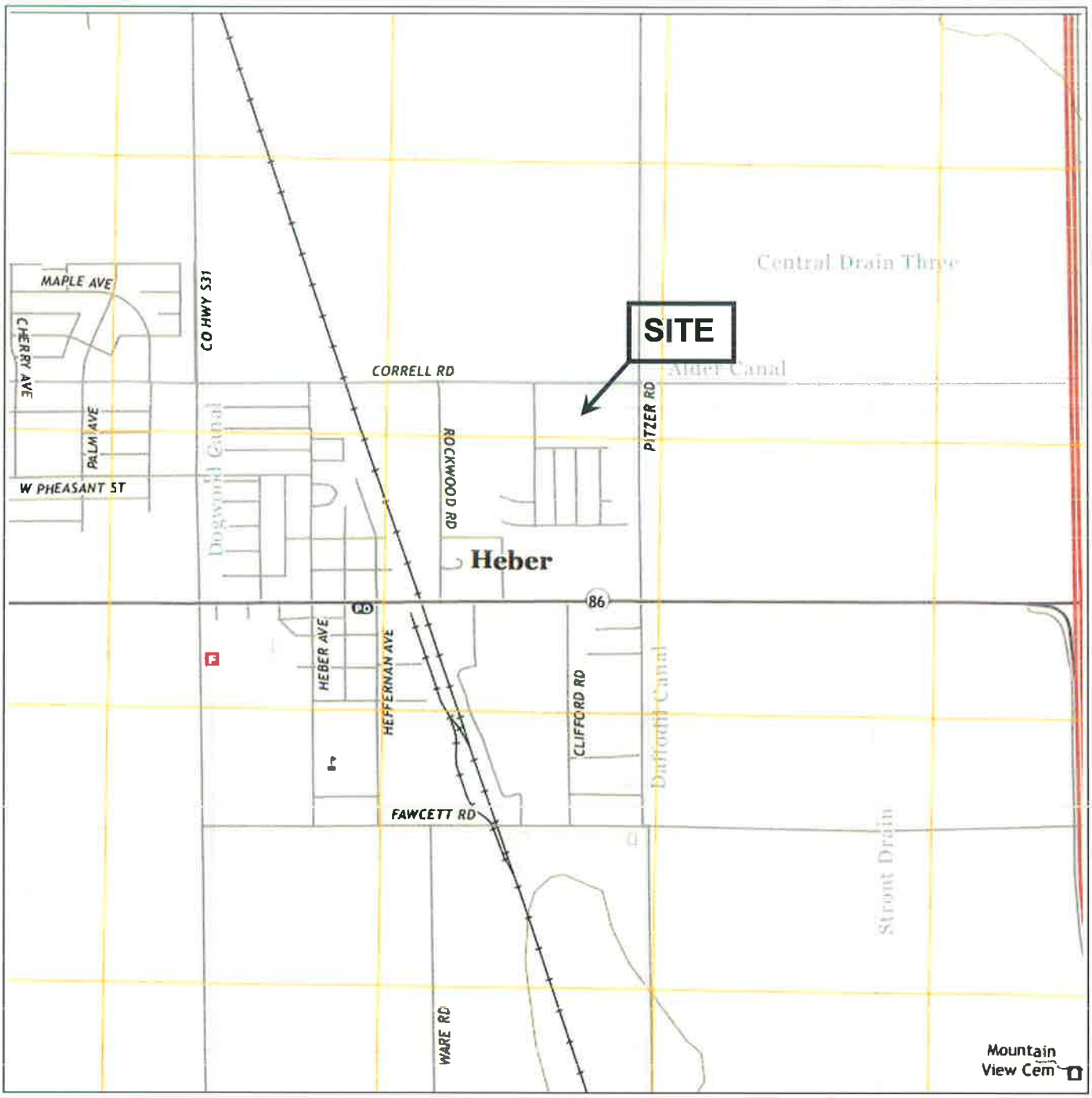


Figure 3 - Topographic Map

185 Willowbrook Way
Heber, California

N

Prepared by:

Weis Environmental
1938 Kellogg Avenue, Suite 116
Carlsbad, CA 92008

Weis ENVIRONMENTAL

APPENDICES

APPENDIX A
TITLE REPORT

First American Title

File No.: NHSC-6166283 (DG)

This report has been amended/updated to reflect the following matters:

[ ] No changes made to the report other than the Effective Date

[ ] Property address has been revised

[X] Vesting has been revised

[ ] Legal Description has been revised

[X] Taxes have been updated

[X] Original item number(s) 13 have been removed

[X] New item number(s) A have been added

[X] Original item number(s) 1 and 16 have been revised

[X] Other: Informational Notes: Item No. 1 have been removed and Item No. 3 have been revised

Updated

First American Title

First American Title Company

4380 La Jolla Village Dr, Suite 200
San Diego, CA 92122

Robert Laing
Pacific Southwest Community Development Corporation
16935 West Bernardo Drive, Suite 238
San Diego, CA 92127

Customer Reference:	Heber Meadows Affordable
Order Number:	NHSC-6166283 (DG)
Title Officer:	Derek Gray
Phone:	(951)256-5880
Fax No.:	(714)913-6750
E-Mail:	degray@firstam.com

Buyer:

PRELIMINARY REPORT

In response to the above referenced application for a policy of title insurance, this company hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception below or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said policy or policies are set forth in Exhibit A attached. *The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties.* Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Exhibit A. Copies of the policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

Dated as of April 08, 2021 at 7:30 A.M.

The form of Policy of title insurance contemplated by this report is:

To Be Determined

A specific request should be made if another form or additional coverage is desired.

Title to said estate or interest at the date hereof is vested in:

HEBER MEADOWS LAND HOLDING LLC, A CALIFORNIA LIMITED LIABILITY COMPANY

The estate or interest in the land hereinafter described or referred to covered by this Report is:

A fee.

The Land referred to herein is described as follows:

(See attached Legal Description)

At the date hereof exceptions to coverage in addition to the printed Exceptions and Exclusions in said policy form would be as follows:

A. General and special taxes and assessments for the fiscal year 2021-2022, a lien not yet due or payable.

1. General and special taxes and assessments for the fiscal year 2020-2021.

First Installment:	$3,101.07, PAID
Penalty:	$0.00
Second Installment:	$3,101.07, OPEN
Penalty:	$0.00
Tax Rate Area:	066002
A. P. No.:	054-601-016-000

2. Intentionally Deleted

3. Assessment liens, if applicable, collected with the general and special taxes, including but not limited to those disclosed by the reflection of the following on the tax roll:

1915 Bond for CUHSD 2016 REF BD & INT.

1915 Bond for CUHSD 2016 SER 2019 BD.

1915 Bond for HEBER ELEM B&I 1998.

1915 Bond for HEBER ESD B&I 2015.

1915 Bond for IMP COM COLLEGE BD 2004.

4. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

5. Liquor restrictions as contained in Deed, recorded November 1, 1906 in Book 399, Page 71 of Deeds records of San Diego.

6. An easement for construction, maintenance and/or use of a canal, telephone and/or electric power line or liens and incidental purposes, recorded January 20, 1944 as Book 612, Page 331 of Official Records.

   In Favor of: Imperial Irrigation District
   Affects: as described therein

   The location of the easement cannot be determined from record information.

7. The terms and provisions contained in the document entitled "Agreement Regarding an Outlet for Waste Water" recorded May 10, 1952 as Instrument No. 6 in Book 838, Page 1 of Official Records.

8. An easement for canal, telephone and/or electric power line or lines and incidental purposes, recorded February 27, 1959 as Instrument No. 8 in Book 1016, Page 595 of Official Records.

   In Favor of: Imperial Irrigation District
   Affects: as described therein

9. Intentionally Deleted

10. Such rights as the California Development Company, now known as the Imperial Irrigation District, may have acquired for right of way under the act of March 3, 1891 (26 Stat. 1101) 43 USC SS946-950, by the filing and approval of Maps of definite location in the district land office, prior to the disposition of said land by the United States of America, lying within the bounds of:

    Central 3-D Drain
    Daffodil Canal
    Central 3-D No. 1

11. An easement shown or dedicated on the Map as referred to in the legal description

    For: drainage, public utility and power line and incidental purposes.

12. The terms and provisions contained in the document entitled "Memorandum of Continuing Disclosure Agreement" recorded December 05, 2005 as Instrument No. 05-49006 of Official Records.

13. Intentionally Deleted

14. Water rights, claims or title to water, whether or not shown by the Public Records.

15. Rights of parties in possession.

Prior to the issuance of any policy of title insurance, the Company will require:

16. With respect to Heber Meadows Land Holding LLC, a California limited liability company:
a. A copy of its operating agreement and any amendments thereto;
b. If it is a California limited liability company, that a certified copy of its articles of organization (LLC-1) and any certificate of correction (LLC-11), certificate of amendment (LLC-2), or restatement of articles of organization (LLC-10) be recorded in the public records;
c. If it is a foreign limited liability company, that a certified copy of its application for registration (LLC-5) be recorded in the public records;
d. With respect to any deed, deed of trust, lease, subordination agreement or other document or instrument executed by such limited liability company and presented for recordation by the Company or upon which the Company is asked to rely, that such document or instrument be executed in accordance with one of the following, as appropriate:
(i) If the limited liability company properly operates through officers appointed or elected pursuant to the terms of a written operating agreement, such document must be executed by at least two duly elected or appointed officers, as follows: the chairman of the board, the president or any vice president, and any secretary, assistant secretary, the chief financial officer or any assistant treasurer;
(ii) If the limited liability company properly operates through a manager or managers identified in the articles of organization and/or duly elected pursuant to the terms of a written operating agreement, such document must be executed by at least two such managers or by one manager if the limited liability company properly operates with the existence of only one manager.
e. Other requirements which the Company may impose following its review of the material required herein and other information which the Company may require

INFORMATIONAL NOTES

Note: The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than the certain dollar amount set forth in any applicable arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. If you desire to review the terms of the policy, including any arbitration clause that may be included, contact the office that issued this Commitment or Report to obtain a sample of the policy jacket for the policy that is to be issued in connection with your transaction.

1. The property covered by this report is vacant land.

2. According to the public records, there has been no conveyance of the land within a period of twenty four months prior to the date of this report, except as follows:

   A document recorded October 30, 2020 as Instrument No. 2020020137 of Official Records.

   From: Heber 20, LLC, a California limited liability company
   To: Heber Meadows Land holding LLC, a California limited liability company

3. We find no outstanding voluntary liens of record affecting subject property. Disclosure should be made concerning the existence of any unrecorded lien or other indebtedness which could give rise to any possible security interest in the subject property.

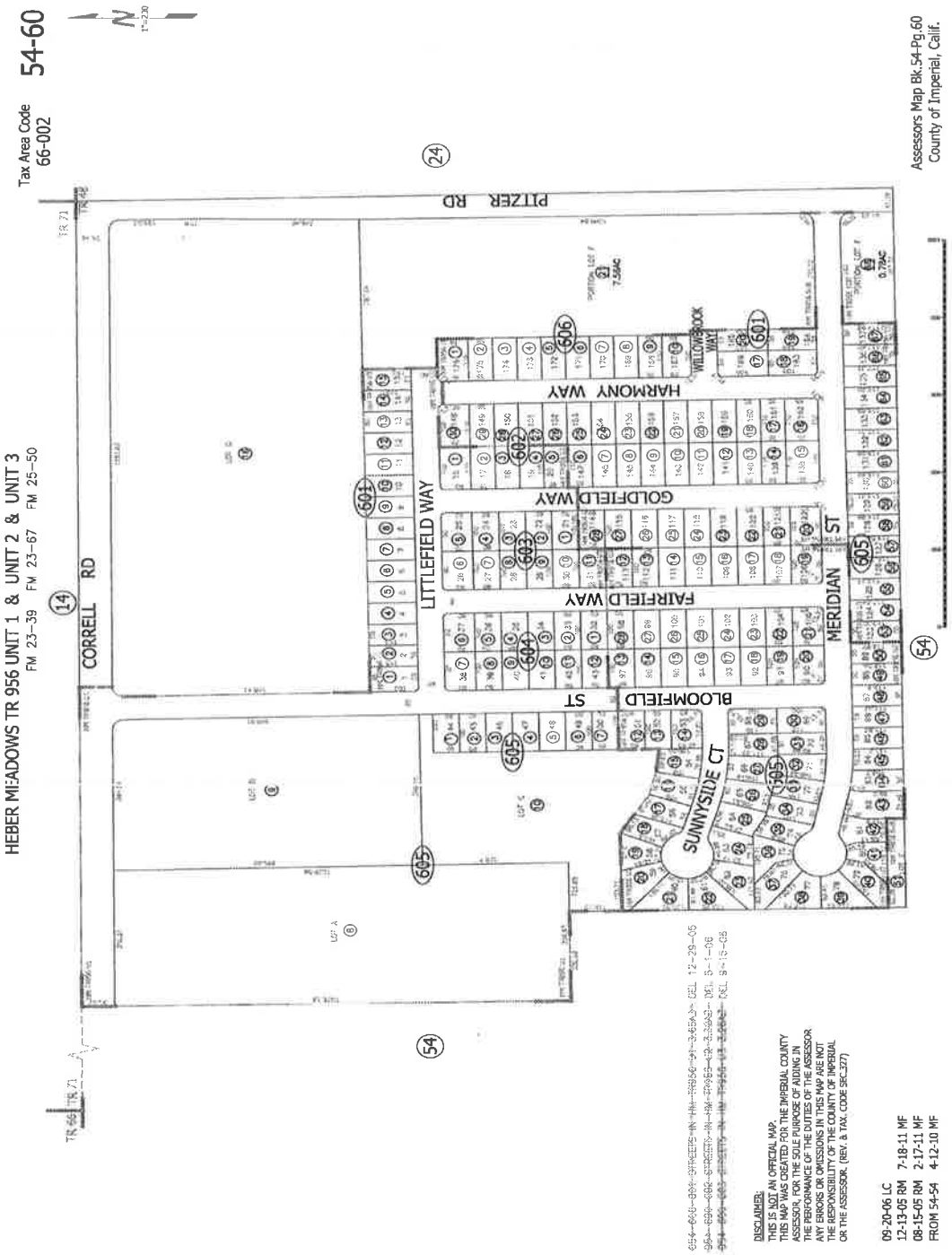
The map attached, if any, may or may not be a survey of the land depicted hereon. First American expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

LEGAL DESCRIPTION

Real property in the unincorporated area of the County of Imperial, State of California, described as follows:

LOT D, OF HEBER MEADOWS TRACT 956 UNIT NO. 1, IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 23, PAGES 39 THROUGH 43 INCLUSIVE OF FINAL MAPS, RECORDS OF IMPERIAL COUNTY, CALIFORNIA.

APN: 054-601-016-000


54-60
Tax Area Code 66-002
Assessors Map Bk.54-Pg.60 County of Imperial, Calif.
HEBER MEADOWS TR 956 UNIT 1 & UNIT 2 & UNIT 3
FM 23-39 FM 23-67 FM 25-50
PITZER RD
CORRELL RD
LITTLEFIELD WAY
HARMONY WAY
GOLDFIELD WAY
FAIRFIELD WAY
BLOOMFIELD ST
MERIDIAN ST
SUNNYSIDE CT
WILLOWBROOK WAY
DISCLAIMER:
THIS IS NOT AN OFFICIAL MAP.
THIS MAP WAS CREATED FOR THE IMPERIAL COUNTY ASSESSOR, FOR THE SOLE PURPOSE OF AIDING IN THE PERFORMANCE OF THE DUTIES OF THE ASSESSOR. ANY ERRORS OR OMISSIONS IN THIS MAP ARE NOT THE RESPONSIBILITY OF THE COUNTY OF IMPERIAL OR THE ASSESSOR. (REV. & TAX. CODE SEC.327)
09-20-06 LC
12-13-05 RM 7-18-11 MF
08-15-05 RM 2-17-11 MF
FROM 54-54 4-12-10 MF

NOTICE

Section 12413.1 of the California Insurance Code, effective January 1, 1990, requires that any title insurance company, underwritten title company, or controlled escrow company handling funds in an escrow or sub-escrow capacity, wait a specified number of days after depositing funds, before recording any documents in connection with the transaction or disbursing funds. This statute allows for funds deposited by wire transfer to be disbursed the same day as deposit. In the case of cashier's checks or certified checks, funds may be disbursed the next day after deposit. In order to avoid unnecessary delays of three to seven days, or more, please use wire transfer, cashier's checks, or certified checks whenever possible.

EXHIBIT A
LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS (BY POLICY TYPE)

CLTA STANDARD COVERAGE POLICY – 1990

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
   (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy; or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public, records.
2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.
6. Any lien or right to a lien for services, labor or material unless such lien is shown by the public records at Date of Policy.

CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)
EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
   a. building;
   b. zoning;
   c. land use;
   d. improvements on the Land;
   e. land division; and
   f. environmental protection.
   This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.
4. Risks:
   a. that are created, allowed, or agreed to by You, whether or not they are recorded in the Public Records;
   b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
   c. that result in no loss to You; or
   d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.
5. Failure to pay value for Your Title.
6. Lack of a right:
   a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   b. in streets, alleys, or waterways that touch the Land.
   This Exclusion does not limit the coverage described in Covered Risk 11 or 21.
7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.
8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:
For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.
The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Policy Amount Shown in Schedule A or $2,500 (whichever is less)	$10,000
Covered Risk 18:	1% of Policy Amount Shown in Schedule A or $5,000 (whichever is less)	$25,000
Covered Risk 19:	1% of Policy Amount Shown in Schedule A or $5,000 (whichever is less)	$25,000
Covered Risk 21:	1% of Policy Amount Shown in Schedule A or $2,500 (whichever is less)	$5,000

2006 ALTA LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;

(iii) the subdivision of land; or
(iv) environmental protection;

or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
(b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
(a) created, suffered, assumed, or agreed to by the Insured Claimant;
(b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
(c) resulting in no loss or damage to the Insured Claimant;
(d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
(e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
(a) a fraudulent conveyance or fraudulent transfer, or
(b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

[Except as provided in Schedule B - Part II,[t[or T]his policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

[PART I

[The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage:]

2006 ALTA OWNER'S POLICY (06-17-06)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

(i) the occupancy, use, or enjoyment of the Land;
(ii) the character, dimensions, or location of any improvement erected on the Land;
(iii) the subdivision of land; or
(iv) environmental protection;

or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
(b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
(a) created, suffered, assumed, or agreed to by the Insured Claimant;
(b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
(c) resulting in no loss or damage to the Insured Claimant;
(d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 or 10); or
(e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
(a) a fraudulent conveyance or fraudulent transfer, or
(b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:
[The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.
7. [Variable exceptions such as taxes, easements, CC&R's, etc. shown here.]

ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (07-26-10)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

(i) the occupancy, use, or enjoyment of the Land;
(ii) the character, dimensions, or location of any improvement erected on the Land;
(iii) the subdivision of land; or
(iv) environmental protection;

or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
(b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d),

14 or 16.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.
6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.
8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.
9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.
10. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
11. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

First American Title™

Privacy Notice

Effective: January 1, 2020

Notice Last Updated: January 1, 2020

This Privacy Notice describes how First American Financial Corporation and its subsidiaries and affiliates (together referred to as "First American," "we," "us," or "our") collect, use, store, and share your information. This Privacy Notice applies to information we receive from you offline only, as well as from third parties. For more information about our privacy practices, please visit https://www.firstam.com/privacy-policy/index.html. The practices described in this Privacy Notice are subject to applicable laws in the places in which we operate.

What Type Of Information Do We Collect About You? We collect both **personal** and **non-personal information** about and from you. **Personal information** is non-public information that can be used to directly or indirectly identify or contact you. **Non-personal information** is any other type of information.

How Do We Collect Your Information? We collect your **personal** and **non-personal information:** (1) directly from you; (2) automatically when you interact with us; and (3) from third parties, including business parties and affiliates.

How Do We Use Your Information? We may use your personal information in a variety of ways, including but not limited to providing the services you have requested, fulfilling your transactions, comply with relevant laws and our policies, and handling a claim. We may use your **non-personal information** for any purpose.

How Do We Share Your Personal Information? We do not sell your **personal information** to nonaffiliated third parties. We will only share your **personal information**, including to subsidiaries, affiliates, and to unaffiliated third parties: (1) with your consent; (2) in a business transfer; (3) to service providers; and (4) for legal process and protection. If you have any questions about how First American shares your **personal information**, you may contact us at dataprivacy@firstam.com or toll free at 1-866-718-0097.

How Do We Secure Your Personal Information? The security of your **personal information** is important to us. That is why we take commercially reasonable steps to make sure your **personal information** is protected. We use our best efforts to maintain commercially reasonable technical, organizational, and physical safeguards, consistent with applicable law, to protect your **personal information**.

How Long Do We Keep Your Personal Information? We keep your **personal information** for as long as necessary in accordance with the purpose for which it was collected, our business needs, and our legal and regulatory obligations.

Your Choices We provide you the ability to exercise certain controls and choices regarding our collection, use, storage, and sharing of your **personal information**. In accordance with applicable law, your controls and choices. You can learn more about your choices, and exercise these controls and choices, by sending an email to dataprivacy@firstam.com or toll free at 1-866-718-0097.

International Jurisdictions: Our Products are hosted and offered in the United States of America (US), and are subject to US federal, state, and local law. If you are accessing the Products from another country, please be advised that you may be transferring your **personal information** to us in the US, and you consent to that transfer and use of your **personal information** in accordance with this Privacy Notice. You also agree to abide by the applicable laws of applicable US federal, state, and local laws concerning your use of the Products, and your agreements with us.

We may change this Privacy Notice from time to time. Any and all changes to this Privacy Notice will be reflected on this page, and where appropriate provided in person or by another electronic method. **YOUR CONTINUED USE, ACCESS, OR INTERACTION WITH OUR PRODUCTS OR YOUR CONTINUED COMMUNICATIONS WITH US AFTER THIS NOTICE HAS BEEN PROVIDED TO YOU WILL REPRESENT THAT YOU HAVE READ AND UNDERSTOOD THIS PRIVACY NOTICE.**

Contact Us dataprivacy@firstam.com or toll free at 1-866-718-0097.

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First American Title™

For California Residents

If you are a California resident, you may have certain rights under California law, including but not limited to the California Consumer Privacy Act of 2018 ("CCPA"). All phrases used in this section shall have the same meaning as those phrases are used under California law, including the CCPA.

Right to Know. You have a right to request that we disclose the following information to you: (1) the categories of **personal information** we have collected about or from you; (2) the categories of sources from which the **personal information** was collected; (3) the business or commercial purpose for such collection and/or disclosure of your personal information; (4) the categories of third parties with whom we have shared your **personal information**; and (5) the specific pieces of your **personal information** we have collected. To submit a verified request for this information, go to our online privacy policy at www.firstam.com/privacy-policy to submit your request or call toll-free at 1-866-718-0097. You may also designate an authorized agent to submit a request on your behalf by going to our online privacy policy at www.firstam.com/privacy-policy to submit your request or by calling toll-free at 1-866-718-0097 and submitting written proof of such authorization to dataprivacy@firstam.com.

Right of Deletion. You also have a right to request that we delete the **personal information** we have collected from you. This right is subject to certain exceptions available under the CCPA and other applicable law. To submit a verified request for deletion, go to our online privacy policy at www.firstam.com/privacy-policy to submit your request or call toll-free at 1-866-718-0097. You may also designate an authorized agent to submit a request on your behalf by going to our online privacy policy at www.firstam.com/privacy-policy to submit your request or by calling toll-free at 1-866-718-0097 and submitting written proof of such authorization to dataprivacy@firstam.com.

Verification Process. For either a request to know or delete, we will verify your identity before responding to your request. To verify your identity, we will generally match the identifying information provided in your request with the information we have on file about you. Depending on the sensitivity of the personal information requested, we may also utilize more stringent verification methods to verify your identity, including but not limited to requesting additional information from you and/or requiring you to sign a declaration under penalty of perjury.

Right to Opt-Out. We do not sell your personal information to third parties, and do not plan to do so in the future.

Right of Non-Discrimination. You have a right to exercise your rights under California law, including under the CCPA, without suffering discrimination. Accordingly, First American will not discriminate against you in any way if you choose to exercise your rights under the CCPA.

Collection Notice. The following is a list of the categories of personal information we may have collected about California residents in the twelve months preceding the date this Privacy Notice was last updated, including the business or commercial purpose for said collection, the categories of sources from which we may have collected the personal information, and the categories of third parties with whom we may have shared the personal information:

Categories of Personal Information Collected	The categories of personal information we have collected include, but may not be limited to: real name; signature; alias; SSN; physical characteristics or description, including protected characteristics under federal or state law; address; telephone number; passport number; driver's license number; state identification card number; IP address; policy number; file number; employment history; bank account number; credit card number; debit card number; financial account numbers; commercial information; internet or other electronic network activity; geolocation data; audio and visual information; professional or employment information; and inferences drawn from the above categories to create a profile about a consumer.
Categories of Sources	Categories of sources from which we've collected **personal information** include, but may not be limited to: the consumer directly; public records; governmental entities; non-affiliated third parties; social media networks; affiliated third parties
Business Purpose for Collection	The business purposes for which we've collected **personal information** include, but may not be limited to: completing a transaction for our Products; verifying eligibility for employment; facilitating employment; performing services on behalf of affiliated and non-affiliated third parties; debugging to identify and repair errors that impair existing intended functionality on our Websites, Applications, or Products; protecting against malicious, deceptive, fraudulent, or illegal activity

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Categories of Third Parties Shared	The categories of third parties with whom we've shared **personal information** include, but may not be limited to: advertising networks; internet service providers; data analytics providers; service providers; government entities; operating systems and platforms; social media networks; non-affiliated third parties; affiliated third parties

Categories of Personal Information We Have Sold In The Past Year. We have not sold any personal information of California residents to any third party in the twelve months preceding the date this Privacy Notice was last updated.

Categories of Personal Information Disclosed For A Business Purpose In The Past Year. The following is a list of the categories of **personal information** of California residents we may have disclosed for a business purpose in the 12 months preceding the date this Privacy Notice was last updated: The categories of personal information we have collected include, but may not be limited to: real name; signature; alias; SSN; physical characteristics or description, including protected characteristics under federal or state law; address; telephone number; passport number; driver's license number; state identification card number; IP address; policy number; file number; employment history; bank account number; credit card number; debit card number; financial account numbers; commercial information; internet or other electronic network activity; geolocation data; audio and visual information; professional or employment information; and inferences drawn from the above categories to create a profile about a consumer.

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APPENDIX B
REGULATORY DATABASE REPORT

ERIS

DATABASE REPORT

Project Property:	*185 Willowbrook Way* *185 Willowbrook Way* *Heber CA 92249*
Project No:	
Report Type:	*Database Report*
Order No:	*21102102211*
Requested by:	*Weis Environmental, LLC*
Date Completed:	*October 22, 2021*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY

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Your Liability for misuse: Using this Service and/or its reports in a manner contrary to this Notice or your agreement will be in breach of copyright and contract and ERIS may obtain damages for such mis-use, including damages caused to third parties, and gives ERIS the right to terminate your account, rescind your license to any previous reports and to bar you from future use of the Service.

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Executive Summary

Property Information:

Project Property:		*185 Willowbrook Way* *185 Willowbrook Way Heber CA 92249*
Project No:		
Coordinates:		
	Latitude:	*32.73692641*
	Longitude:	*-115.5194592*
	UTM Northing:	*3,623,092.57*
	UTM Easting:	*638,721.40*
	UTM Zone:	*11S*
Elevation:		*-13 FT*

Order Information:

Order No:	*21102102211*
Date Requested:	*October 21, 2021*
Requested by:	*Weis Environmental, LLC*
Report Type:	*Database Report*

Historicals/Products:

ERIS Xplorer	*ERIS Xplorer*
Excel Add-On	*Excel Add-On*

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
Standard Environmental Records								
Federal								
DOE FUSRAP	Y	1	0	0	0	0	0	0
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	0	0	0	0	-	0
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	0	0	1	-	1
CERCLIS	Y	0.5	0	0	0	1	-	1
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	0	0	1	-	1
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	0	-	0
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	0	0	-	-	0
RCRA VSQG	Y	0.25	0	0	0	-	-	0
RCRA NON GEN	Y	0.25	0	0	1	-	-	1
FED ENG	Y	0.5	0	0	0	0	-	0
FED INST	Y	0.5	0	0	0	0	-	0
LUCIS	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0
FRP	Y	0.25	0	0	0	-	-	0
HIST GAS STATIONS	Y	0.25	0	0	0	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0
SUPERFUND ROD	Y	1	0	0	0	0	0	0
State								
RESPONSE	Y	1	0	0	0	0	0	0
ENVIROSTOR	Y	1	0	0	0	2	0	2
DELISTED ENVS	Y	1	0	0	0	0	0	0
SWF/LF	Y	0.5	0	0	0	0	-	0
SWRCB SWF	Y	0.5	0	0	0	0	-	0
HWP	Y	1	0	0	0	0	0	0
SWAT	Y	0.5	0	0	0	0	-	0
C&D DEBRIS RECY	Y	0.5	0	0	0	0	-	0
RECYCLING	Y	0.5	0	0	0	0	-	0
PROCESSORS	Y	0.5	0	0	0	0	-	0
CONTAINER RECY	Y	0.5	0	0	0	0	-	0
LDS	Y	0.5	0	0	0	0	-	0
LUST	Y	0.5	0	0	0	0	-	0
DELISTED LST	Y	0.5	0	0	0	0	-	0
UST	Y	0.25	0	0	0	-	-	0
UST CLOSURE	Y	0.5	0	0	0	0	-	0
HHSS	Y	0.25	0	0	0	-	-	0
UST SWEEPS	Y	0.25	0	0	0	-	-	0
AST	Y	0.25	0	0	0	-	-	0
AST SWRCB	Y	0.25	0	0	0	-	-	0
TANK OIL GAS	Y	0.25	0	0	0	-	-	0
DELISTED TNK	Y	0.25	0	0	0	-	-	0
CERS TANK	Y	0.25	0	0	1	-	-	1
DELISTED CTNK	Y	0.25	0	0	0	-	-	0
HIST TANK	Y	0.25	0	0	0	-	-	0
LUR	Y	0.5	0	0	0	0	-	0
CALSITES	Y	0.5	0	0	0	1	-	1
HLUR	Y	0.5	0	0	0	0	-	0
DEED	Y	0.5	0	0	0	0	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
VCP	Y	0.5	0	0	0	0	-	0
CLEANUP SITES	Y	0.5	0	0	0	0	-	0
DELISTED COUNTY	Y	0.25	0	0	0	-	-	0
Tribal								
INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED ILST	Y	0.5	0	0	0	0	-	0
DELISTED IUST	Y	0.25	0	0	0	-	-	0
County								
CUPA IMPERIAL	Y	0.25	0	0	2	-	-	2
Additional Environmental Records								
Federal								
PFAS NPL	Y	0.5	0	0	0	0	-	0
FINDS/FRS	Y	PO	0	-	-	-	-	0
TRIS	Y	PO	0	-	-	-	-	0
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
FORMER NIKE	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
SMCRA	Y	1	0	0	0	0	0	0
MRDS	Y	1	0	0	0	0	0	0
URANIUM	Y	1	0	0	0	0	0	0
ALT FUELS	Y	0.25	0	0	0	-	-	0
SSTS	Y	0.25	0	0	0	-	-	0
PCB	Y	0.5	0	0	0	0	-	0
State								
DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DRYC GRANT	Y	0.25	0	0	0	-	-	0
PFAS	Y	0.5	0	0	0	0	-	0
PFAS GW	Y	0.5	0	0	0	0	-	0
HWSS CLEANUP	Y	0.5	0	0	0	0	-	0
DTSC HWF	Y	0.5	0	0	0	0	-	0
INSP COMP ENF	Y	1	0	0	0	0	0	0
SCH	Y	1	0	0	0	0	0	0
CHMIRS	Y	PO	0	-	-	-	-	0
HIST CHMIRS	Y	PO	0	-	-	-	-	0
HAZNET	Y	PO	0	-	-	-	-	0
HIST MANIFEST	Y	PO	0	-	-	-	-	0
HW TRANSPORT	Y	0.125	0	0	-	-	-	0
WASTE TIRE	Y	PO	0	-	-	-	-	0
MEDICAL WASTE	Y	0.25	0	0	0	-	-	0
HIST CORTESE	Y	0.5	0	0	0	0	-	0
CDO/CAO	Y	0.5	0	0	0	0	-	0
CERS HAZ	Y	0.125	0	0	-	-	-	0
DELISTED HAZ	Y	0.5	0	0	0	0	-	0
GEOTRACKER	Y	0.125	0	0	-	-	-	0
MINE	Y	1	0	0	0	0	0	0
LIEN	Y	PO	0	-	-	-	-	0
WASTE DISCHG	Y	0.25	0	0	0	-	-	0
EMISSIONS	Y	0.25	0	0	0	-	-	0
CDL	Y	0.125	0	0	-	-	-	0

Tribal ***No Tribal additional environmental record sources available for this State.***

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
County	No County additional environmental databases were selected to be included in the search.							
Total:			0	0	4	6	0	10

** PO – Property Only*
** 'Property and adjoining properties' database search radii are set at 0.25 miles.*

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	CUPA IMPERIAL	HEBER PUBLIC UTILITY DISTRICT - WASTE WATER TREATMENT PLANT	1184 ROCKWOOD AVE HEBER CA 92249	W	0.21 / 1,114.59	1	18
1	CERS TANK	Heber Public Utility District - Waste Water Treatment Plant	1184 ROCKWOOD AVE HEBER CA 92249	W	0.21 / 1,114.59	1	18
			Site ID: 273079				
1	RCRA NON GEN	HEBER PUBLIC UTILITY DISTRICT - WATER TREATMENT PLANT	1184 ROCKWOOD AVE HEBER CA 92249	W	0.21 / 1,114.59	1	22
			EPA Handler ID: CAL000406079				
2	CUPA IMPERIAL	AT&T CORP.-DA16M	1190 ROCKWOOD RD HEBER CA 92249	W	0.21 / 1,114.84	0	23
3	ENVIROSTOR	IMPERIAL VALLEY AG PRODUCTS	95 EAST HEBER ROAD HEBER CA 92249	SSE	0.38 / 2,017.97	8	23
			***Estor/EPA ID	Cleanup Status:*** 13510001	REFER: OTHER AGENCY AS OF 8/31/1995		
4	CERCLIS	PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249	SW	0.44 / 2,316.61	5	24
			Site EPA ID: CAD983639543				
4	CERCLIS NFRAP	PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249	SW	0.44 / 2,316.61	5	26
			Site EPA ID: CAD983639543				
4	ENVIROSTOR	PUREGRO - HEBER FACILITY	89 MAIN STREET HEBER CA 92249	SW	0.44 / 2,316.61	5	27
			***Estor/EPA ID	Cleanup Status:*** 13070096	REFER: RWQCB AS OF 5/16/1994		
4	CALSITES	PUREGRO - HEBER FACILITY	89 MAIN STREET HEBER CA 92249	SW	0.44 / 2,316.61	5	27
5	SEMS ARCHIVE	PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249	SW	0.45 / 2,352.57	4	28
			EPA ID: CAD983639543				

Executive Summary: Summary by Data Source

Standard

Federal

SEMS ARCHIVE - SEMS List 8R Archive Sites

A search of the SEMS ARCHIVE database, dated Jul 29, 2021 has found that there are 1 SEMS ARCHIVE site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249 ***EPA ID:*** *CAD983639543*	SW	0.45 / 2,352.57	5

CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS

A search of the CERCLIS database, dated Oct 25, 2013 has found that there are 1 CERCLIS site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249 ***Site EPA ID:*** *CAD983639543*	SW	0.44 / 2,316.61	4

CERCLIS NFRAP - CERCLIS - No Further Remedial Action Planned

A search of the CERCLIS NFRAP database, dated Oct 25, 2013 has found that there are 1 CERCLIS NFRAP site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PUREGRO CO. (HEBER)	89 EAST MAIN ST. HEBER CA 92249 ***Site EPA ID:*** *CAD983639543*	SW	0.44 / 2,316.61	4

RCRA NON GEN - RCRA Non-Generators

A search of the RCRA NON GEN database, dated Jun 14, 2021 has found that there are 1 RCRA NON GEN site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HEBER PUBLIC UTILITY DISTRICT - WATER TREATMENT PLANT	1184 ROCKWOOD AVE HEBER CA 92249 ***EPA Handler ID:*** *CAL000406079*	W	0.21 / 1,114.59	1

State

ENVIROSTOR - EnviroStor Database

A search of the ENVIROSTOR database, dated Jun 14, 2021 has found that there are 2 ENVIROSTOR site(s) within approximately 1.00 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
IMPERIAL VALLEY AG PRODUCTS	95 EAST HEBER ROAD HEBER CA 92249	SSE	0.38 / 2,017.97	3
	***Estor/EPA ID** | **Cleanup Status**: 13510001 | REFER: OTHER AGENCY AS OF 8/31/1995*			
PUREGRO - HEBER FACILITY	89 MAIN STREET HEBER CA 92249	SW	0.44 / 2,316.61	4
	***Estor/EPA ID** | **Cleanup Status**: 13070096 | REFER: RWQCB AS OF 5/16/1994*			

CERS TANK - California Environmental Reporting System (CERS) Tanks

A search of the CERS TANK database, dated Sep 24, 2021 has found that there are 1 CERS TANK site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
Heber Public Utility District - Waste Water Treatment Plant	1184 ROCKWOOD AVE HEBER CA 92249	W	0.21 / 1,114.59	1
	***Site ID**: 273079*			

CALSITES - CALSITES Database

A search of the CALSITES database, dated May 1, 2004 has found that there are 1 CALSITES site(s) within approximately 0.50 miles of the project property.

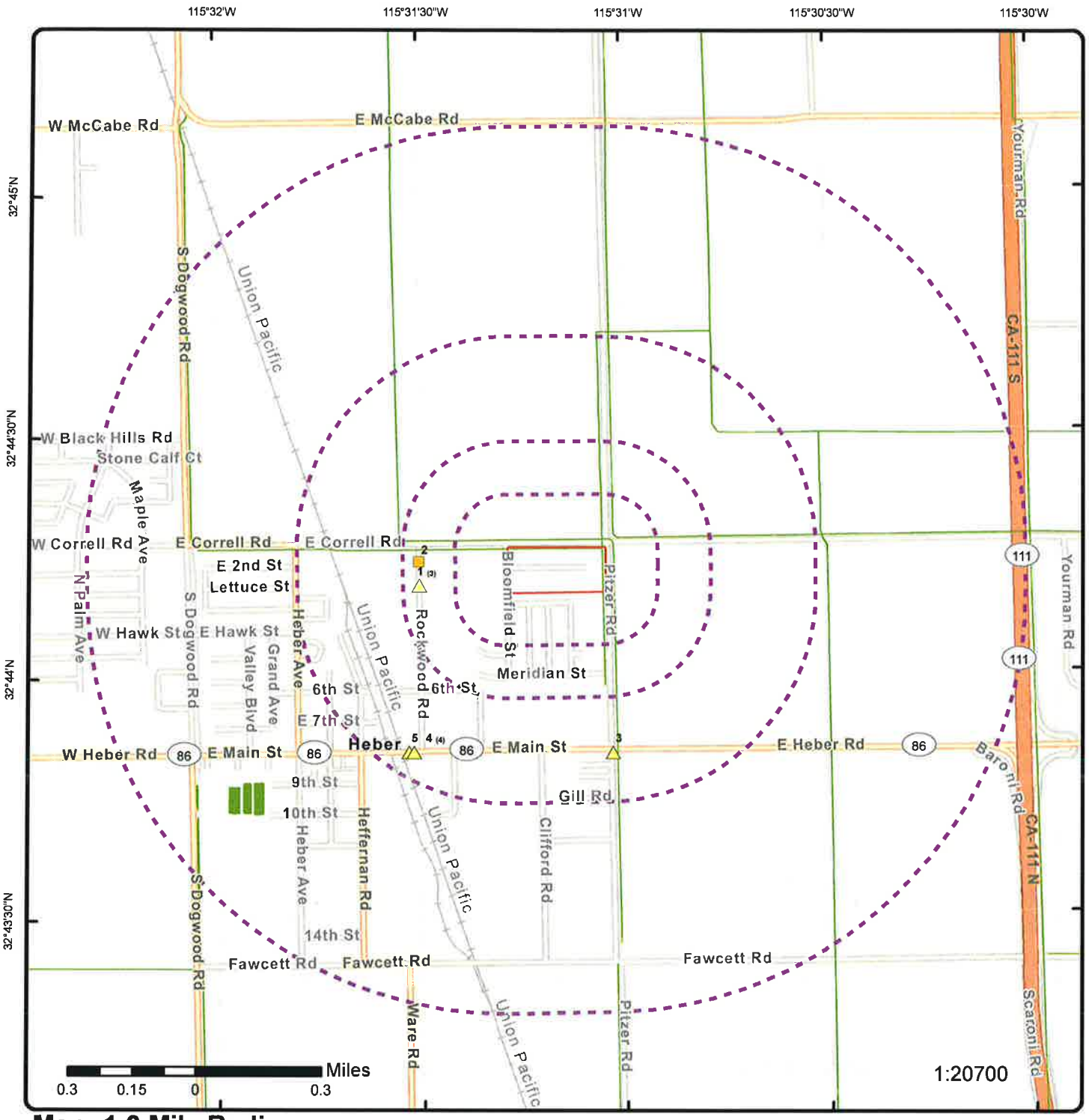
Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PUREGRO - HEBER FACILITY	89 MAIN STREET HEBER CA 92249	SW	0.44 / 2,316.61	4

County

CUPA IMPERIAL - Imperial County - CUPA Facility List

A search of the CUPA IMPERIAL database, dated Jul 14, 2021 has found that there are 2 CUPA IMPERIAL site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
HEBER PUBLIC UTILITY DISTRICT - WASTE WATER TREATMENT PLANT	1184 ROCKWOOD AVE HEBER CA 92249	W	0.21 / 1,114.59	1
AT&T CORP.-DA16M	1190 ROCKWOOD RD HEBER CA 92249	W	0.21 / 1,114.84	2



Map: 1.0 Mile Radius

Order Number: 21102102211

Address: 185 Willowbrook Way, Heber, CA

ERIS

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Eris Areas with Higher Elevation
- Eris Areas with Same Elevation
- Eris Areas with Lower Elevation
- Eris Areas with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major & Minor Arterial
- Traffic Circle; Ramp
- Local Road
- Rail
- State
- Country
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)
- Plume

Source: © 2021 ESRI StreetMap Premium

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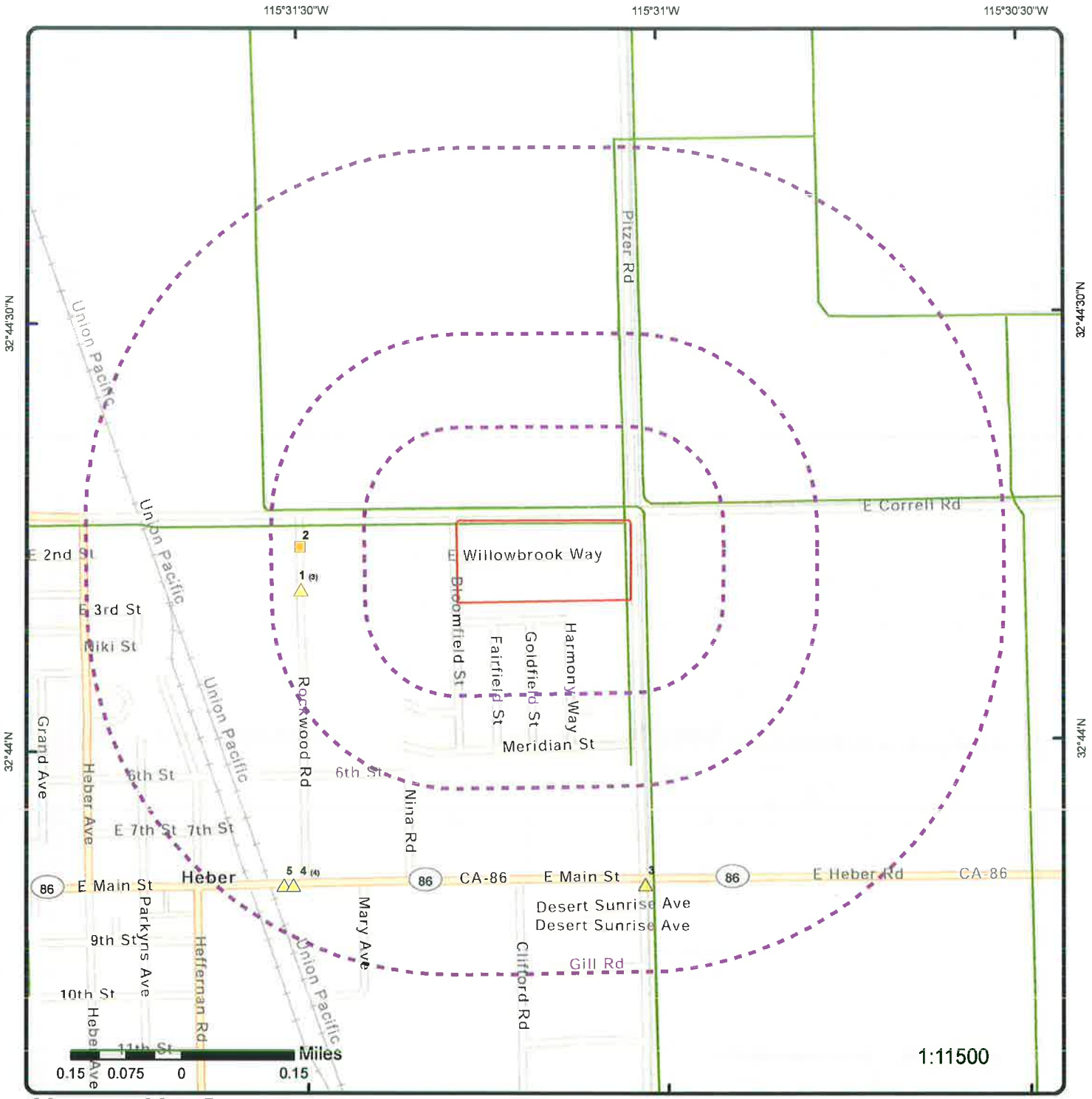

Map: 0.5 Mile Radius

Order Number: 21102102211

Address: 185 Willowbrook Way, Heber, CA

ERIS

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Eris Areas with Higher Elevation
- Eris Areas with Same Elevation
- Eris Areas with Lower Elevation
- Eris Areas with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major & Minor Arterial
- Traffic Circle; Ramp
- Local Road
- Rail
- State
- Country
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)
- Plume

Source: © 2021 ESRI StreetMap Premium

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Map: 0.25 Mile Radius

Order Number: 21102102211

Address: 185 Willowbrook Way, Heber, CA

ERIS

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Eris Areas with Higher Elevation
- Eris Areas with Same Elevation
- Eris Areas with Lower Elevation
- Eris Areas with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major & Minor Arterial
- Traffic Circle; Ramp
- Local Road
- Rail
- State
- Country
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)
- Plume

Source: © 2021 ESRI StreetMap Premium

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Aerial Year: 2019

Address: 185 Willowbrook Way, Heber, CA

Source: ESRI World Imagery

Order Number: 21102102211

ERIS

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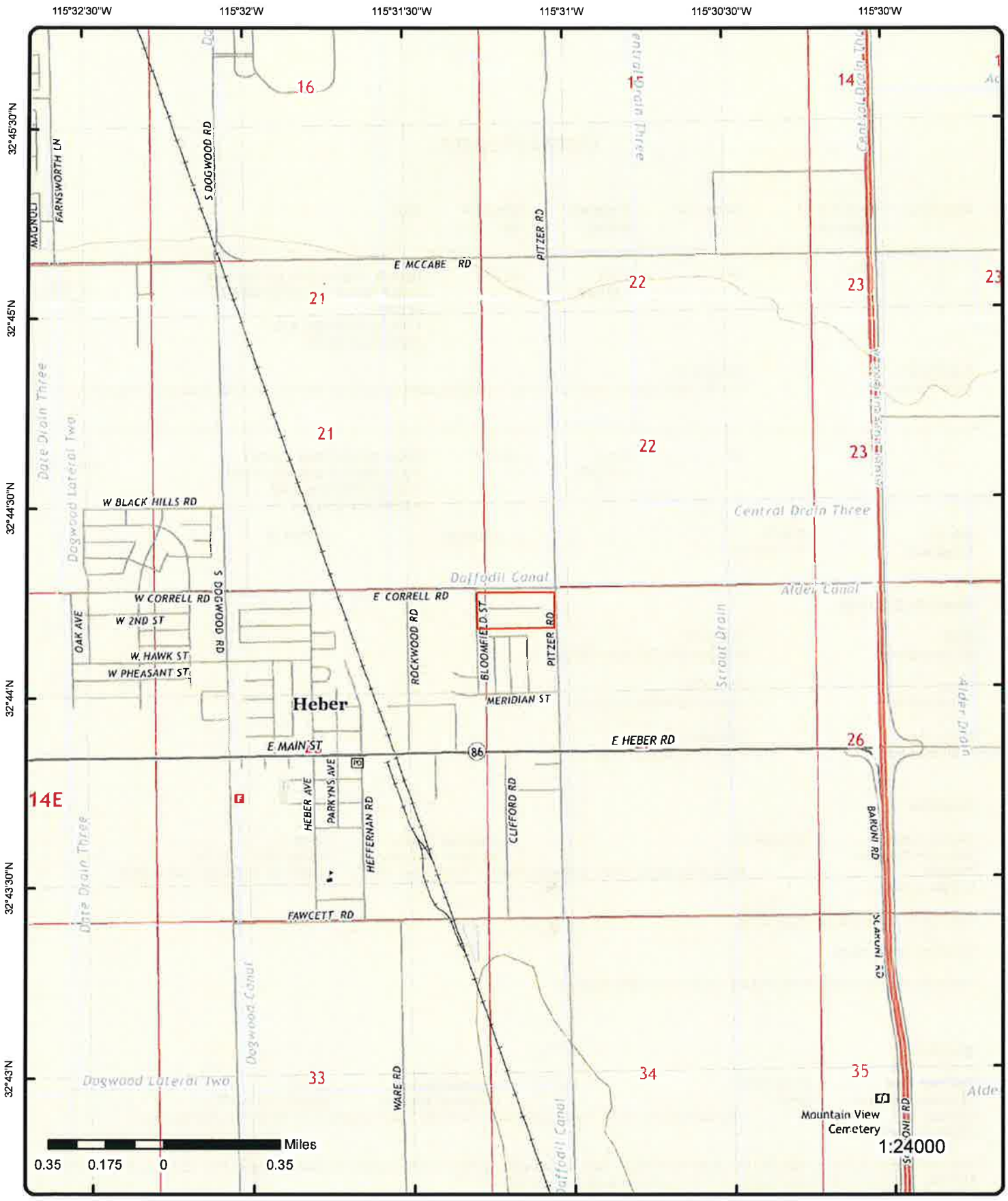

Topographic Map

Year: 2015

Order Number: 21102102211

Address: 185 Willowbrook Way, CA

Quadrangle(s): Holtville West, CA; Heber, CA; Calexico, CA; El Centro, CA

Source: USGS Topographic Map

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Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	1 of 3	W	0.21 / 1,114.59	-12.71 / 1	HEBER PUBLIC UTILITY DISTRICT - WASTE WATER TREATMENT PLANT 1184 ROCKWOOD AVE HEBER CA 92249	CUPA IMPERIAL

Facility ID: FA0000739
Data Source: CUPA Facility List for Imperial County; Imperial Hazardous Materials Reports; Imperial Hazardous Waste Reports

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	2 of 3	W	0.21 / 1,114.59	-12.71 / 1	Heber Public Utility District - Waste Water Treatment Plant 1184 ROCKWOOD AVE HEBER CA 92249	CERS TANK

Site ID: 273079 **Latitude:** 32.730100
Longitude: -115.524700

Regulated Programs

EI ID: 10625572
EI Description: Aboveground Petroleum Storage

EI ID: 10625572
EI Description: Hazardous Waste Generator

EI ID: 10625572
EI Description: Chemical Storage Facilities

Violations

Violation Date: 02/02/2018 **Violation Source:** CERS
Violation Program: HW **Violation Division:** Imperial CUPA - DTSC
Citation: 22 CCR 12 66262.23(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.23(a)
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure to properly complete the Uniform Hazardous Waste Manifest.

Violations

Violation Date: 08/08/2019 **Violation Source:** CERS
Violation Program: APSA **Violation Division:** Imperial CUPA - DTSC
Citation: HSC 6.67 25270.4.5(a) - California Health and Safety Code, Chapter 6.67, Section(s) 25270.4.5(a)
Violation Notes:

Returned to compliance on 09/10/2019. OBSERVATION: Failure to prepare a Spill Prevention Control & Countermeasure Plan (SPCC). CORRECTIVE ACTION: Prepare a Spill Prevention Control & Countermeasure Plan(SPCC).

Violation Description:

Failure to prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS
Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: HSC 6.5 25160(b)(1)(C) - California Health and Safety Code, Chapter 6.5, Section(s) 25160(b)(1)(C)
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure to send a legible copy of each hazardous waste manifest to the Department within 30 days of each shipment of hazardous waste.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS
Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: HSC 6.5 25123.3(h)(2) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(2)
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure to determine the status of any hazardous waste if a signed copy of the manifest isn't received within 35 days of the date the waste was accepted by the initial transporter and/or to submit an Exception Report to DTSC if a signed copy of the manifest isn't received within 60 days of the date the waste was accepted by the initial transporter.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS
Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: HSC 6.5 25160.2 - California Health and Safety Code, Chapter 6.5, Section(s) 25160.2
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure of a generator of hazardous waste that meets the conditions to be transported on a consolidated manifest to comply with one or more of the required consolidated manifesting procedures and retain copies of receipts for three years.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS
Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: 22 CCR 12 66262.20 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.20
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure to prepare a Uniform Hazardous Waste Manifest and, if necessary, a Continuation Sheet, before the transport of a hazardous waste off-site for transfer, treatment, storage, or disposal.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS

Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: 22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.

Violations

Violation Date: 02/02/2018 ***Violation Source:*** CERS
Violation Program: HW ***Violation Division:*** Imperial CUPA - DTSC
Citation: 22 CCR 12 66262.27(b) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.27(b)
Violation Notes:

Returned to compliance on 02/20/2018.

Violation Description:

Failure of a small quantity hazardous waste generator to certify to the following statement on the Uniform Hazardous Waste Manifest: "I am a small quantity generator. I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford."

Evaluations

Eval Date: 03/04/2016
Violations Found: No
Eval General Type: Compliance Evaluation Inspection
Eval Type: Routine done by local agency
Eval Division: Imperial CUPA - DTSC
Eval Program: HMRRP
Eval Source: CERS
Eval Notes:

INSPECTOR E. MATHIS. NO VIOLATIONS OBSERVED; Note: data in [EVAL Notes] field for some records is truncated from the source.

Eval Date: 02/02/2018
Violations Found: Yes
Eval General Type: Compliance Evaluation Inspection
Eval Type: Routine done by local agency
Eval Division: Imperial CUPA - DTSC
Eval Program: HW
Eval Source: CERS
Eval Notes:

Eval Date: 08/08/2019
Violations Found: No
Eval General Type: Compliance Evaluation Inspection
Eval Type: Routine done by local agency
Eval Division: Imperial CUPA - DTSC
Eval Program: HW
Eval Source: CERS
Eval Notes:

Eval Date: 08/08/2019
Violations Found: No
Eval General Type: Compliance Evaluation Inspection
Eval Type: Routine done by local agency
Eval Division: Imperial CUPA - DTSC

Eval Program: HMRRP
Eval Source: CERS
Eval Notes:

Eval Date: 08/08/2019
Violations Found: Yes
Eval General Type: Compliance Evaluation Inspection
Eval Type: Routine done by local agency
Eval Division: Imperial CUPA - DTSC
Eval Program: APSA
Eval Source: CERS
Eval Notes:

Affiliations

Affil Type Desc: Identification Signer
Entity Name: Laura Fischer
Entity Title: General Manager
Address:
City:
State:
Country:
Zip Code:
Phone:

Affil Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title:
Address: P.O. Box H
City: Heber
State: CA
Country:
Zip Code: 92249
Phone:

Affil Type Desc: CUPA District
Entity Name: Imperial CUPA - DTSC
Entity Title:
Address: 627 Wake Avenue
City: El Centro
State: CA
Country:
Zip Code: 92243
Phone: (760) 352-0381

Affil Type Desc: Document Preparer
Entity Name: Ruiz & Associates
Entity Title:
Address:
City:
State:
Country:
Zip Code:
Phone:

Affil Type Desc: Environmental Contact
Entity Name: Francisco Rodriguez
Entity Title:
Address: P.O. Box H
City: Heber
State: CA
Country:
Zip Code: 92249
Phone:

Affil Type Desc: Operator

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Entity Name: Heber Public Utility District - Waste Water Treatment Plant
Entity Title:
Address:
City:
State:
Country:
Zip Code:
Phone: (760) 482-2440

Affil Type Desc: Property Owner
Entity Name: HEBER PUBLIC UTILITY DISTRICT
Entity Title:
Address: P.O. Box H
City: Heber
State: CA
Country: United States
Zip Code: 92249
Phone: (760) 482-2440

Affil Type Desc: Parent Corporation
Entity Name: Heber Public Utility Distric-Water Plant
Entity Title:
Address:
City:
State:
Country:
Zip Code:
Phone:

Affil Type Desc: Legal Owner
Entity Name: HEBER PUBLIC UTILITY DISTRICT
Entity Title:
Address: P.O. BOX H
City: HEBER
State: CA
Country: United States
Zip Code: 92249
Phone: (760) 482-2440

Coordinates

Env Int Type Code: HWG
Program ID: 10625572
Latitude: 32.736431
Longitude: -115.524437
Coord Name:
Ref Point Type Desc: Unknown

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	3 of 3	W	0.21 / 1,114.59	-12.71 / 1	HEBER PUBLIC UTILITY DISTRICT - WATER TREATMENT PLANT 1184 ROCKWOOD AVE HEBER CA 92249	RCRA NON GEN

EPA Handler ID: CAL000406079
Gen Status Universe: No Report
Contact Name: LAURA FISCHER
Contact Address: 1078 DOGWOOD RD STE 103 , , HEBER , CA, 92249 ,
Contact Phone No and Ext: 760-482-2440
Contact Email: LFISCHER@HEBER.CA.GOV
Contact Country:
County Name: IMPERIAL
EPA Region: 09
Land Type:
Receive Date: 20150415
Location Latitude: 32.736429
Location Longitude: -115.525078

Violation/Evaluation Summary

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Note: NO RECORDS: As of Jun 2021, there are no Compliance Monitoring and Enforcement (violation) records associated with this facility (EPA ID).

Handler Summary

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility:	No
Onsite Burner Exemption:	No
Furnace Exemption:	No
Underground Injection Activity:	No
Commercial TSD:	No
Used Oil Transporter:	No
Used Oil Transfer Facility:	No
Used Oil Processor:	No
Used Oil Refiner:	No
Used Oil Burner:	No
Used Oil Market Burner:	No
Used Oil Spec Marketer:	No

Hazardous Waste Handler Details

Sequence No:	1
Receive Date:	20150415
Handler Name:	HEBER PUBLIC UTILITY DISTRICT - WATER TREATMENT PLANT
Source Type:	Implementer
Federal Waste Generator Code:	N
Generator Code Description:	Not a Generator, Verified

Owner/Operator Details

Owner/Operator Ind:	Current Owner	**Street No:**	
Type:	Other	**Street 1:**	1078 DOGWOOD RD STE 103
Name:	HEBER PUBLIC UTILITY DISTRICT	**Street 2:**	
Date Became Current:		**City:**	HEBER
Date Ended Current:		**State:**	CA
Phone:	760-482-2440	**Country:**	
Source Type:	Implementer	**Zip Code:**	92249
Owner/Operator Ind:	Current Operator	**Street No:**	
Type:	Other	**Street 1:**	1078 DOGWOOD RD STE 103
Name:	LAURA FISCHER	**Street 2:**	
Date Became Current:		**City:**	HEBER
Date Ended Current:		**State:**	CA
Phone:	760-482-2440	**Country:**	
Source Type:	Implementer	**Zip Code:**	92249

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
2	1 of 1	W	0.21 / 1,114.84	-13.03 / 0	AT&T CORP.-DA16M 1190 ROCKWOOD RD HEBER CA 92249	CUPA IMPERIAL

Facility ID: FA0001513
Data Source: CUPA Facility List for Imperial County; Imperial Hazardous Materials Reports

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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
3	1 of 1	SSE	0.38 / 2,017.97	-5.17 / 8	IMPERIAL VALLEY AG PRODUCTS 95 EAST HEBER ROAD HEBER CA 92249	ENVIROSTOR

Estor/EPA ID:	13510001	**Assembly District:**	56
Site Code:		**Senate District:**	40
Nat Priority List:	NO	**Permit Renewal Lead:**	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

APN:	NONE SPECIFIED	**Public Partici Spclst:**	
Census Tract:	6025011900	**Project Manager:**	
Site Type:	* HISTORICAL	**County:**	IMPERIAL
Address Description:	95 EAST HEBER ROAD	**Latitude:**	32.7306
Office:	CLEANUP CYPRESS	**Longitude:**	-115.5172
Special Program:		**Acres:**	0 ACRES
Funding:		**Supervisor:**	

Cleanup Status: REFER: OTHER AGENCY AS OF 8/31/1995
Cleanup Oversight Agencies: NONE SPECIFIED
School District:
Past Use that Caused Contam: NONE SPECIFIED
Potential Media Affected: NONE SPECIFIED
Potential Contamin of Concern:

UNSPECIFIED AQUEOUS SOLUTION

Site History:

Status: REFER: OTHER AGENCY
A2 Program Type: HISTORICAL
CalEnviroScreen Score: 86-90%
Summary Link: https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=13510001

Completed Activities

Title: Site Screening
Title Link:
Area Name:
Area Link:
Sub Area:
Sub Area Link:
Document Type: Site Screening
Date Completed: 6/25/1987
Comments: SITE SCREENING DONE RATIONALE - POSS ONSITE CONTAM

Title: Discovery
Title Link:
Area Name:
Area Link:
Sub Area:
Sub Area Link:
Document Type: * Discovery
Date Completed: 1/12/1983
Comments: FACILITY IDENTIFIED ID VIA 82 PHONE BOOK

---

4 **1 of 4** **SW** **0.44 / 2,316.61** **-8.39 / 5** **PUREGRO CO. (HEBER)**
89 EAST MAIN ST.
HEBER CA 92249
CERCLIS

Site ID:	0904531	**RNPL Status Code:**	N
Site EPA ID:	CAD983639543	**NPL Status:**	Not on the NPL
Site Street Address 2:		**RFED Facility Code:**	N
Site County Name:	IMPERIAL	**RFED Facility Desc:**	Not a Federal Facility
Site FIPS Code:	06025	**USGS Hydro Unit No.:**	18100200
Region Code:	09	**Site Cong. Dist. Code:**	45
Site SMSA No.:		**ROT Desc:**	Private
Site Prim. Latitude:	32D43M50S	**FR NPL Update No.:**	
Site Prim. Longitude:	115D31M31S	**RFRA Code:**	
Lat Long Source:			

RNON NPL Status Desc: NFRAP-Site does not qualify for the NPL based on existing information

CERCLIS Assess History

OU ID:	00	**RALT Short Name:**	EPA Fund
Act Code ID:	001	**Act Start Date:**	

RAT Code:	PA	**Act Complete Date:**	10/6/1993 00:00:00
RAT Short Name:	PA	**AGT Order No.:**	130
RAT Name:	PRELIMINARY ASSESSMENT	**SH OU:**	
RAT Hist. Only Flag:		**SH Code:**	
RAT NSI Indicator:	B	**SH Seq:**	
RAT Level:	1	**SH Start Date:**	
RAT DEF OU:	00	**SH Complete Date:**	
RFBS Code:	P	**SH Lead:**	
SPA Code:	13		

RAT Def: Collection of diverse existing information about the source and nature of the site hazard. It is EPA policy to complete the preliminary assessment within one year of site discovery.

Site Desc:

Site Alias:

CERCLIS Assess History

OU ID:	00	**RALT Short Name:**	
Act Code ID:		**Act Start Date:**	
RAT Code:		**Act Complete Date:**	
RAT Short Name:		**AGT Order No.:**	0
RAT Name:		**SH OU:**	
RAT Hist. Only Flag:		**SH Code:**	
RAT NSI Indicator:		**SH Seq:**	
RAT Level:		**SH Start Date:**	
RAT DEF OU:		**SH Complete Date:**	
RFBS Code:		**SH Lead:**	
SPA Code:			

RAT Def:

Site Desc: No description available

Site Alias: No alias data available

CERCLIS Assess History

OU ID:	00	**RALT Short Name:**	EPA In-House
Act Code ID:	001	**Act Start Date:**	
RAT Code:	VS	**Act Complete Date:**	10/6/1993 00:00:00
RAT Short Name:	ARCH SITE	**AGT Order No.:**	1500
RAT Name:	ARCHIVE SITE	**SH OU:**	
RAT Hist. Only Flag:		**SH Code:**	
RAT NSI Indicator:	B	**SH Seq:**	
RAT Level:	1	**SH Start Date:**	
RAT DEF OU:	00	**SH Complete Date:**	
RFBS Code:		**SH Lead:**	
SPA Code:	13		

RAT Def: The decision is made that no further activity is planned at the site.

Site Desc:

Site Alias:

CERCLIS Assess History

OU ID:	00	**RALT Short Name:**	EPA Fund
Act Code ID:	001	**Act Start Date:**	
RAT Code:	DS	**Act Complete Date:**	7/23/1992 00:00:00
RAT Short Name:	DISCVRY	**AGT Order No.:**	10
RAT Name:	DISCOVERY	**SH OU:**	
RAT Hist. Only Flag:		**SH Code:**	
RAT NSI Indicator:	B	**SH Seq:**	
RAT Level:	1	**SH Start Date:**	
RAT DEF OU:	00	**SH Complete Date:**	
RFBS Code:		**SH Lead:**	
SPA Code:	13		

RAT Def: The process by which a potential hazardous waste site is brought to the attention of the EPA. The process can occur through the use of several mechanisms such as a phone call or referral by another government agency.

Site Desc:

Site Alias:

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
4	2 of 4	SW	0.44 / 2,316.61	-8.39 / 5	PUREGRO CO. (HEBER) 89 EAST MAIN ST. HEBER CA 92249	CERCLIS NFRAP

Site ID: 904531
Site EPA ID: CAD983639543
Site Parent ID:
Site County Name: IMPERIAL
Parent Site Name:
Site FIPS Code: 6025
Region Code: 9
Site Cong. Dist. Code: 45
Federal Facility:

CERCLIS-NFRAP Assess History

OU ID: 0
Act Code ID: 1
RAT Code: VS
RAT Short Name: ARCH SITE
RAT Name: ARCHIVE SITE
RAT Hist. Only Flag:
RAT NSI Indicator: B
RAT Level: 1
RAT DEF OU: 00
RFBS Code:
SPA Code: 13
RALT Short Name: EPA In-House
RAT Def: The decision is made that no further activity is planned at the site.
RNON NPL Status Desc: NFRAP-Site does not qualify for the NPL based on existing information
Act Start Date:
Act Complete Date: 10/6/1993
AGT Order No.: 1500
SH OU:
SH Code:
SH Seq:
SH Start Date:
SH Complete Date:
SH Lead:
SH Qual:
RAQ Act. Qual Short:
RNPL Status Code: N

CERCLIS-NFRAP Assess History

OU ID: 0
Act Code ID: 1
RAT Code: PA
RAT Short Name: PA
RAT Name: PRELIMINARY ASSESSMENT
RAT Hist. Only Flag:
RAT NSI Indicator: B
RAT Level: 1
RAT DEF OU: 00
RFBS Code: P
SPA Code: 13
RALT Short Name: EPA Fund
RAT Def: Collection of diverse existing information about the source and nature of the site hazard. It is EPA policy to complete the preliminary assessment within one year of site discovery.
RNON NPL Status Desc: NFRAP-Site does not qualify for the NPL based on existing information
Act Start Date:
Act Complete Date: 10/6/1993
AGT Order No.: 130
SH OU:
SH Code:
SH Seq:
SH Start Date:
SH Complete Date:
SH Lead:
SH Qual:
RAQ Act. Qual Short: NFRAP
RNPL Status Code: N

CERCLIS-NFRAP Assess History

OU ID: 0
Act Code ID: 1
RAT Code: DS
RAT Short Name: DISCVRY
RAT Name: DISCOVERY
RAT Hist. Only Flag:
RAT NSI Indicator: B
RAT Level: 1
RAT DEF OU: 00
RFBS Code:
SPA Code: 13
RALT Short Name: EPA Fund
RAT Def: The process by which a potential hazardous waste site is brought to the attention of the EPA. The process can occur through the use of several mechanisms such as a phone call or referral by another government agency.
RNON NPL Status Desc: NFRAP-Site does not qualify for the NPL based on existing information
Act Start Date:
Act Complete Date: 7/23/1992
AGT Order No.: 10
SH OU:
SH Code:
SH Seq:
SH Start Date:
SH Complete Date:
SH Lead:
SH Qual:
RAQ Act. Qual Short:
RNPL Status Code: N

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
4	3 of 4	SW	0.44 / 2,316.61	-8.39 / 5	PUREGRO - HEBER FACILITY 89 MAIN STREET HEBER CA 92249	ENVIROSTOR

Estor/EPA ID: 13070096
Site Code:
Nat Priority List: NO
APN: NONE SPECIFIED
Census Tract: 6025011300
Site Type: * HISTORICAL
Address Description: 89 MAIN STREET
Office: CLEANUP CYPRESS
Special Program:
Funding:
Cleanup Status: REFER: RWQCB AS OF 5/16/1994
Cleanup Oversight Agencies: NONE SPECIFIED
School District:
Past Use that Caused Contam: NONE SPECIFIED
Potential Media Affected: NONE SPECIFIED
Potential Contamin of Concern:

CONTAMINATED SOIL
CADMIUM AND COMPOUNDS

Assembly District:
Senate District:
Permit Renewal Lead:
Public Partici Spclst:
Project Manager:
County: IMPERIAL
Latitude: 32.7306728
Longitude: -115.5255731
Acres: NONE SPECIFIED
Supervisor:

Site History:

In March 1992, DTSC received a workplan prepared by Mittel- hauser Corp. for a removal action at a site about 3 miles south of Heber on an arroyo on Robert Lizarraga's property. It is alleged that Purgro disposed of soil removed from under the tank farm at the Heber facility during renovat- ions.

Status: REFER: RWQCB
A2 Program Type: HISTORICAL
CalEnviroScreen Score: 86-90%
Summary Link: https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=13070096

Completed Activities

Title: Site Screening
Title Link:
Area Name:
Area Link:
Sub Area:
Sub Area Link:
Document Type: Site Screening
Date Completed: 10/1/1992
Comments: Site screening done by Region 4 staff. Samples taken at the site show: cadmium from 0.83 to 3.44 mg/l > 1 mg/l, 1,2 di- chloropropane from 0.016 mg/kg to 0.045 mg/kg > 0.014 mg/kg, and DDT isomers from 0.036 to 0.79 mg/kg > 0.087 mg/kg. The RWQCB is lead agency for this removal because the arroyo disposal area is under their jurisdiction. Recommend a PEA be performed after the removal to see if a problem still exists.

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
4	4 of 4	SW	0.44 / 2,316.61	-8.39 / 5	PUREGRO - HEBER FACILITY 89 MAIN STREET HEBER CA 92249	CALSITES

ID No: 13070096
Status Date: 05/16/1994
NPL:
Tier:
Fund:
Access :
Access Code: NOT REPORTED
Cortese: D
Hrscore:
Hrsdate:
Groundwater Contam:
GW Code: NOT REPORTED
No Sources: 0
RWQCB Name:

Assembly:
Senate:
Region: 4
Region Name: LONG BEACH
County Co: 13
Facility County: IMPERIAL
Lat Deg: 0
Lat Min: 0
Lat Sec: 0
Lat Dir:
Long Deg: 0
Long Min: 0
Long Sec: 0
Long Dir:

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Branch Name: SOUTHERN CA. - B
Limethod:
Staff:
Lidesc:
Senior:
Status Name: PROPERTY/SITE REFERRED TO RWQCB
Type Name: N/A
Lead Name: N/A
SIC Name: AGRICULTURAL SERVICES
Filename:
Background:

In March 1992, DTSC received a workplan prepared by Mittel-hauser Corp. for a removal action at a site about 3 miles south of Heber on an arroyo on Robert Lizarraga's property. It is alleged that Purgro disposed of soil removed from under the tank farm at the Heber facility during renovat-ions.

Comments:

BREA: Facility identified I.D. via 82 phone book. On February 24, 1983, a questionnaire was sent and on the 18th of March, it was received by the Department of Toxics. On May 15, 1983, the Department noted that BREA is a subsidiary of Puregro Co as of 1/82. Evaporation basin onsite-max flow 300 gal/day of agricultural chemicals (RWQCB files). DHS IWD survey. Fertilizer and farm chemical distributor with onsite disposal in ponds.
On September 28, 1983, a facility drive-by was conducted. Several large storage tanks, +100 portable tanks on site A few 55 gallon drums were also observed. No observation of the back grounds was possible at that time. On September 30, 1983, final strategy: Site refered: HWMB/TSD. Received a workplan prepared by Mittelhauser Corp. for a re-moval of soil from a site on Robert Lizarraga's property located 3 miles south of Heber along an arroyo. Site screening done by Region 4 staff. Samples taken at the site show: cadmium from 0.83 to 3.44 mg/l > 1 mg/l, 1,2 di-chloropropane from 0.016 mg/kg to 0.045 mg/kg > 0.014 mg/kg, and DDT isomers from 0.036 to 0.79 mg/kg > 0.087 mg/kg. The RWQCB is lead agency for this removal because the arroyo disposal area is under their jurisdiction. Recommend a PEA be performed after the removal to see if a problem still exists. REFERRED TO SAN DIEGO RWQCB--MARK ALPERT

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5 **1 of 1** **SW** **0.45 / 2,352.57** **-8.89 / 4** **PUREGRO CO. (HEBER)**
89 EAST MAIN ST.
HEBER CA 92249
SEMS ARCHIVE

Site ID: 0904531
EPA ID: CAD983639543
Superfund Alt Agmt: No
Federal Facility: No
FF Docket: No
NPL: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

FIPS Code: 06025
Cong District: 45
Region: 09
County: IMPERIAL

Action Information

Operable Units: 00
Action Code: PA
Action Name: PA
SEQ: 1
Start Actual:
Finish Actual: 10/06/1993
Qual: N
Curr Action Lead: EPA Perf

Operable Units: 00
Action Code: DS
Action Name: DISCVRY
SEQ: 1
Start Actual: 07/23/1992
Finish Actual: 07/23/1992
Qual:
Curr Action Lead: EPA Perf

Operable Units: 00
Action Code: VS
Action Name: ARCH SITE
SEQ: 1
Start Actual:
Finish Actual: 10/06/1993
Qual:
Curr Action Lead: EPA Perf In-Hse

Unplottable Summary

Total: 2 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID
EMISSIONS	HEBER GEOTHERMAL	PITZER ROAD	HEBER CA	92249	861235832
FINDS/FRS	ORMAT TECHNOLOGIES, INC.	8895 PITZER ROAD ***Registry ID:*** 110070310850	HEBER CA	92249	872634642

Unplottable Report

Site: ***HEBER GEOTHERMAL***
PITZER ROAD HEBER CA 92249

EMISSIONS

1987 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:			
Non-Cancer Chronic Haz Ind:			
Non-Cancer Acute Haz Ind:			

1990 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:			
Non-Cancer Chronic Haz Ind:			
Non-Cancer Acute Haz Ind:			

1993 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:			
Non-Cancer Chronic Haz Ind:			
Non-Cancer Acute Haz Ind:			

1995 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:			
Non-Cancer Chronic Haz Ind:			
Non-Cancer Acute Haz Ind:			

1996 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	

Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:	.15		
Non-Cancer Chronic Haz Ind:	.35		
Non-Cancer Acute Haz Ind:	.35		

1997 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:	.15		
Non-Cancer Chronic Haz Ind:	.35		
Non-Cancer Acute Haz Ind:	.35		

1998 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:	.15		
Non-Cancer Chronic Haz Ind:	.35		
Non-Cancer Acute Haz Ind:	.35		

1999 Toxic Data

Facility ID:	43	***COID:***	IMP
Facility SIC Code:	4911	***DISN:***	IMPERIAL COUNTY APCD
CO:	13	***CHAPIS:***	
Air Basin:	SS	***CERR Code:***	
District:	IMP		
TS:			
Health Risk Asmt:	.2		
Non-Cancer Chronic Haz Ind:	.4		
Non-Cancer Acute Haz Ind:	.4		

Site: ***ORMAT TECHNOLOGIES, INC.***
8895 PITZER ROAD HEBER CA 92249 FINDS/FRS

Registry ID:	110070310850
FIPS Code:	
HUC Code:	
Site Type Name:	
Location Description:	
Supplemental Location:	
Create Date:	27-SEP-18
Update Date:	
Interest Types:	OSHA ESTABLISHMENT
SIC Codes:	
SIC Code Descriptions:	
NAICS Codes:	221118
NAICS Code Descriptions:	
Conveyor:	
Federal Facility Code:	
Federal Agency Name:	
Tribal Land Code:	
Tribal Land Name:	
Congressional Dist No:	
Census Block Code:	
EPA Region Code:	09
County Name:	

US/Mexico Border Ind:
Latitude:
Longitude:
Reference Point:
Coord Collection Method:
Accuracy Value:
Datum: NAD83
Source:
Facility Detail Rprt URL: https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070310850
Program Acronyms:

OSHA-OIS:342906609

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

Formerly Utilized Sites Remedial Action Program: DOE FUSRAP

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

Government Publication Date: Mar 4, 2017

National Priority List: NPL

National Priorities List (Superfund)-NPL: EPA's (United States Environmental Protection Agency) list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action.

Government Publication Date: Aug 25, 2021

National Priority List - Proposed: PROPOSED NPL

Includes sites proposed (by the EPA, the state, or concerned citizens) for addition to the NPL due to contamination by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

Government Publication Date: Aug 25, 2021

Deleted NPL: DELETED NPL

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Government Publication Date: Aug 25, 2021

SEMS List 8R Active Site Inventory: SEMS

The Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted.

Government Publication Date: Jul 29, 2021

Inventory of Open Dumps, June 1985: ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

SEMS List 8R Archive Sites: SEMS ARCHIVE

The Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

Government Publication Date: Jul 29, 2021

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS: CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

EPA Report on the Status of Open Dumps on Indian Lands: IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

CERCLIS - No Further Remedial Action Planned: CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens: CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action: RCRA CORRACTS

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Jun 14, 2021

RCRA non-CORRACTS TSD Facilities: RCRA TSD

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Government Publication Date: Jun 14, 2021

RCRA Generator List: RCRA LQG

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Jun 14, 2021

RCRA Small Quantity Generators List: RCRA SQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Jun 14, 2021

RCRA Very Small Quantity Generators List: RCRA VSQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Very Small Quantity Generators (VSQG) generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.

Government Publication Date: Jun 14, 2021

RCRA Non-Generators: RCRA NON GEN

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Jun 14, 2021

Federal Engineering Controls-ECs: FED ENG

Engineering controls (ECs) encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Feb 23, 2021

Federal Institutional Controls- ICs: FED INST

Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's (United States Environmental Protection Agency) expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

Government Publication Date: Feb 23, 2021

Land Use Control Information System: LUCIS

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

Government Publication Date: Sep 1, 2006

Emergency Response Notification System: ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System: ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System: ERNS

Database of oil and hazardous substances spill reports made available by the United States Coast Guard National Response Center (NRC). The NRC fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. These data contain initial incident data that has not been validated or investigated by a federal/state response agency.

Government Publication Date: Jul 26, 2021

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database: FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Aug 20, 2021

FEMA Underground Storage Tank Listing: FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: Dec 31, 2017

Facility Response Plan: FRP

List of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

Government Publication Date: Dec 2, 2020

Historical Gas Stations: HIST GAS STATIONS

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

Government Publication Date: Jul 1, 1930

Petroleum Refineries: REFN

List of petroleum refineries from the U.S. Energy Information Administration (EIA) Refinery Capacity Report. Includes operating and idle petroleum refineries (including new refineries under construction) and refineries shut down during the previous year located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U.S. possessions. Survey locations adjusted using public data.

Government Publication Date: Jul 10, 2020

Petroleum Product and Crude Oil Rail Terminals: BULK TERMINAL

List of petroleum product and crude oil rail terminals made available by the U.S. Energy Information Administration (EIA). Includes operable bulk petroleum product terminals located in the 50 States and the District of Columbia with a total bulk shell storage capacity of 50,000 barrels or more, and/or the ability to receive volumes from tanker, barge, or pipeline; also rail terminals handling the loading and unloading of crude oil that were active between 2017 and 2018. Petroleum product terminals comes from the EIA-815 Bulk Terminal and Blender Report, which includes working, shell in operation, and shell idle for several major product groupings. Survey locations adjusted using public data.

Government Publication Date: Apr 28, 2020

LIEN on Property: SEMS LIEN

The EPA Superfund Enterprise Management System (SEMS) provides LIEN information on properties under the EPA Superfund Program.

Government Publication Date: Jul 29, 2021

Superfund Decision Documents: SUPERFUND ROD

This database contains a listing of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD), along with other associated memos and files. This information is maintained and made available by the US EPA (Environmental Protection Agency).

Government Publication Date: Jun 28, 2021

State

State Response Sites: RESPONSE

A list of identified confirmed release sites where the Department of Toxic Substances Control (DTSC) is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. This database is state equivalent NPL.

Government Publication Date: Jun 14, 2021

EnviroStor Database: ENVIROSTOR

The EnviroStor Data Management System is made available by the Department of Toxic Substances Control (DTSC). Includes Corrective Action sites, Tiered Permit sites, Historical Sites and Evaluation/Investigation sites. This database is state equivalent CERCLIS.

Government Publication Date: Jun 14, 2021

Delisted State Response Sites: DELISTED ENVS

Sites removed from the list of State Response Sites made available by the EnviroStor Data Management System, Department of Toxic Substances Control (DTSC).

Government Publication Date: Jun 14, 2021

Solid Waste Information System (SWIS): SWF/LF

The Solid Waste Information System (SWIS) database made available by the Department of Resources Recycling and Recovery (CalRecycle) contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites.

Government Publication Date: Jul 20, 2021

Solid Waste Disposal Sites with Waste Constituents Above Hazardous Waste Levels: SWRCB SWF

This is a list of solid waste disposal sites identified by California State Water Resources Control Board with waste constituents above hazardous waste levels outside the waste management unit.

Government Publication Date: Sep 20, 2006

EnviroStor Hazardous Waste Facilities: HWP

A list of hazardous waste facilities including permitted, post-closure and historical facilities found in the Department of Toxic Substances Control (DTSC) EnviroStor database.

Government Publication Date: Jun 14, 2021

Sites Listed in the Solid Waste Assessment Test (SWAT) Program Report: SWAT

In a 1993 Memorandum of Understanding, the State Water Resources Control Board (SWRCB) agreed to submit a comprehensive report on the Solid Waste Assessment Test (SWAT) Program to the California Integrated Waste Management Board (CIWMB). This report summarizes the work completed to date on the SWAT Program, and addresses both the impacts that leakage from solid waste disposal sites (SWDS) may have upon waters of the State and the actions taken to address such leakage.

Government Publication Date: Dec 31, 1995

Construction and Demolition Debris Recyclers: C&D DEBRIS RECY

This listing of Construction and Demolition Debris Recyclers is maintained by the California Intergrated Waste Management Board-common C&D materials include lumber, drywall, metals, masonry (brick, concrete, etc.), carpet, plastic, pipe, rocks, dirt, paper, cardboard, or green waste related to land development.

Government Publication Date: Jun 20, 2018

Recycling Centers: RECYCLING

This list of Certified Recycling Centers that are operating under the state of California's Beverage Container Recycling Program is maintained by the California Department of Resources Recycling and Recovery.

Government Publication Date: Nov 2, 2020

Listing of Certified Processors: PROCESSORS

This list of Certified Processors that are operating under the state of California's Beverage Container Recycling Program is maintained by the California Department of Resources Recycling and Recovery.

Government Publication Date: Oct 27, 2020

Listing of Certified Dropoff, Collection, and Community Service Programs: CONTAINER RECY

This list of Certified Dropoff, Collection, and Community Service Programs (non-buyback) operating under the state of California's Beverage Container Recycling Program is maintained by the California Department of Resources Recycling and Recovery.

Government Publication Date: Dec 16, 2020

Land Disposal Sites: LDS

Land Disposal Sites in GeoTracker, the State Water Resources Control Board (SWRCB)'s data management system. The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units. Waste management units include waste piles, surface impoundments, and landfills.

Government Publication Date: Jun 22, 2021

Leaking Underground Fuel Tank Reports: LUST

List of Leaking Underground Storage Tanks within the Cleanup Sites data in GeoTracker database. GeoTracker is the State Water Resources Control Board's (SWRCB) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense and Site Cleanup Program) as well as permitted facilities such as operating Underground Storage Tanks. The Leak Prevention Program that overlooks LUST sites is the SWRCB in California's Environmental Protection Agency.

Government Publication Date: Jun 22, 2021

Delisted Leaking Storage Tanks: DELISTED LST

List of Leaking Underground Storage Tanks (LUST) cleanup sites removed from GeoTracker, the State Water Resources Control Board (SWRCB)'s database system, as well as sites removed from the SWRCB's list of UST Case closures.

Government Publication Date: Jun 22, 2021

Permitted Underground Storage Tank (UST) in GeoTracker: UST

List of Permitted Underground Storage Tank (UST) sites made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA).

Government Publication Date: Jul 25, 2021

Proposed Closure of Underground Storage Tank Cases: UST CLOSURE

List of UST cases that are being considered for closure by either the California Environmental Protection Agency, State Water Resources Control Board or the Executive Director that have been posted for a 60-day public comment period.

Government Publication Date: May 5, 2021

Historical Hazardous Substance Storage Information Database: HHSS

The Historical Hazardous Substance Storage database contains information collected in the 1980s from facilities that stored hazardous substances. The information was originally collected on paper forms, was later transferred to microfiche, and recently indexed as a searchable database. When using this database, please be aware that it is based upon self-reported information submitted by facilities which has not been independently verified. It is unlikely that every facility responded to the survey and the database should not be expected to be a complete inventory of all facilities that were operating at that time. This database is maintained by the California State Water Resources Control Board's (SWRCB) Geotracker.

Government Publication Date: Aug 27, 2015

Statewide Environmental Evaluation and Planning System: UST SWEEPS

The Statewide Environmental Evaluation and Planning System (SWEEPS) is a historical listing of active and inactive underground storage tanks made available by the California State Water Resources Control Board (SWRCB).

Government Publication Date: Oct 1, 1994

Aboveground Storage Tanks: AST

A statewide list from 2009 of aboveground storage tanks (ASTs) made available by the Cal FIRE Office of the State Fire Marshal (OSFM). This list is no longer maintained or updated by the Cal FIRE OSFM.

Government Publication Date: Aug 31, 2009

SWRCB Historical Aboveground Storage Tanks: AST SWRCB

A list of aboveground storage tanks made available by the California State Water Resources Control Board (SWRCB). Effective January 1, 2008, the Certified Unified Program Agencies (CUPAs) are vested with the responsibility and authority to implement the Aboveground Petroleum Storage Act (APSA).

Government Publication Date: Dec 1, 2007

Oil and Gas Facility Tanks: TANK OIL GAS

Locations of oil and gas tanks that fall under the jurisdiction of the Geologic Energy Management Division of the California Department of Conservation (CalGEM) (CCR 1760). CalGEM was formerly the Division of Oil, Gas, and Geothermal Resources (DOGGR).

Government Publication Date: Sep 13, 2021

Delisted Storage Tanks: DELISTED TNK

This database contains a list of storage tank sites that were removed by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA) and the Cal FIRE Office of State Fire Marshal (OSFM).

Government Publication Date: Sep 13, 2021

California Environmental Reporting System (CERS) Tanks: CERS TANK

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.

Government Publication Date: Sep 24, 2021

Delisted California Environmental Reporting System (CERS) Tanks: DELISTED CTNK

This database contains a list of Aboveground Petroleum Storage and Underground Storage Tank sites that were removed from in the California Environmental Protection Agency (CalEPA) Regulated Site Portal.

Government Publication Date: Sep 24, 2021

Historical Hazardous Substance Storage Container Information - Facility Summary: HIST TANK

The State Water Resources Control Board maintained the Hazardous Substance Storage Containers listing and inventory in th 1980s. This facility summary lists historic tank sites where the following container types were present: farm motor vehicle fuel tanks; waste tanks; sumps; pits, ponds, lagoons, and others; and all other product tanks. This set, published in May 1988, lists facility and owner information, as well as the number of containers. This data is historic and will not be updated.

Government Publication Date: May 27, 1988

Site Mitigation and Brownfields Reuse Program Facility Sites with Land Use Restrictions: LUR

The Department of Toxic Substances Control (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents land use restrictions that are active. Some sites have multiple land use restrictions.

Government Publication Date: Jun 14, 2021

CALSITES Database: CALSITES

This historical database was maintained by the Department of Toxic Substance Control (DTSC) for more than a decade. CALSITES contains information on Brownfield properties with confirmed or potential hazardous contamination. In 2006, DTSC introduced EnviroStor as the latest Brownfields site database.

Government Publication Date: May 1, 2004

Hazardous Waste Management Program Facility Sites with Deed / Land Use Restrictions: HLUR

The Department of Toxic Substances Control (DTSC) Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Government Publication Date: Feb 18, 2021

Deed Restrictions and Land Use Restrictions: DEED

List of Deed Restrictions, Land Use Restrictions and Covenants in GeoTracker made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency. A deed restriction (land use covenant) may be required to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

Government Publication Date: Jun 22, 2021

Voluntary Cleanup Program: VCP

List of sites in the Voluntary Cleanup Program made available by the Department of Toxic Substances and Control (DTSC). The Voluntary Cleanup Program was designed to respond to lower priority sites. Under the Voluntary Cleanup Program, DTSC enters site-specific agreements with project proponents for DTSC oversight of site assessment, investigation, and/or removal or remediation activities, and the project proponents agree to pay DTSC's reasonable costs for those services.

Government Publication Date: Jun 14, 2021

GeoTracker Cleanup Program Sites: CLEANUP SITES

A list of Cleanup Program sites in the state of California made available by The State Water Resources Control Board (SWRCB) of the California Environmental Protection Agency (EPA). SWRCB tracks leaking underground storage tank cleanups as well as other water board cleanups.

Government Publication Date: Jun 22, 2021

Delisted County Records: DELISTED COUNTY

Records removed from county or CUPA databases. Records may be removed from the county lists made available by the respective county departments because they are inactive, or because they have been deemed to be below reportable thresholds.

Government Publication Date: Oct 7, 2021

Tribal

Leaking Underground Storage Tanks (LUSTs) on Indian Lands: INDIAN LUST
LUSTs on Tribal/Indian Lands in Region 9, which includes California.
Government Publication Date: Apr 8, 2020

Underground Storage Tanks (USTs) on Indian Lands: INDIAN UST
USTs on Tribal/Indian Lands in Region 9, which includes California.
Government Publication Date: Apr 8, 2020

Delisted Tribal Leaking Storage Tanks: DELISTED ILST
Leaking Underground Storage Tank facilities which have been removed from the Regional Tribal LUST lists made available by the EPA.
Government Publication Date: Apr 14, 2020

Delisted Tribal Underground Storage Tanks: DELISTED IUST
Underground Storage Tank facilities which have been removed from the Regional Tribal UST lists made available by the EPA.
Government Publication Date: Apr 14, 2020

County

Imperial County - CUPA Facility List: CUPA IMPERIAL
A list of facilities associated with various Certified Unified Program Agency (CUPA) programs in Imperial County. This list is made available by the California Department of Toxic Substances Control (DTSC) which is appointed as CUPA for Imperial County.
Government Publication Date: Jul 14, 2021

Additional Environmental Record Sources

Federal

PFOA/PFOS Contaminated Sites: PFAS NPL
List of sites where PFOA or PFOS contaminants have been found in drinking water or soil. Made available by the Federal Environmental Protection Agency (EPA).
Government Publication Date: Sep 17, 2021

Facility Registry Service/Facility Index: FINDS/FRS
The Facility Registry Service (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, and data collected from EPA's Central Data Exchange registrations and data management personnel. This list is made available by the Environmental Protection Agency (US EPA).
Government Publication Date: Nov 2, 2020

Toxics Release Inventory (TRI) Program: TRIS
The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U. S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.
Government Publication Date: Aug 24, 2021

Perfluorinated Alkyl Substances (PFAS) Releases: PFAS TRI

List of Toxics Release Inventory (TRI) facilities at which the reported chemical is a Per- or polyfluorinated alkyl substance (PFAS) included in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances. The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment.

Government Publication Date: Aug 24, 2021

Perfluorinated Alkyl Substances (PFAS) Water Quality: PFAS WATER

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). This listing includes records from the Water Quality Portal where the characteristic (environmental measurement) is in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances.

Government Publication Date: Jul 20, 2020

Hazardous Materials Information Reporting System: HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

Government Publication Date: Sep 1, 2020

National Clandestine Drug Labs: NCDL

The U.S. Department of Justice ("the Department") provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: Oct 5, 2020

Toxic Substances Control Act: TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

Government Publication Date: Apr 11, 2019

Hist TSCA: HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing: FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing: FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List: PRP

Early in the cleanup process, the Environmental Protection Agency (EPA) conducts a search to find the potentially responsible parties (PRPs). EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site.

Government Publication Date: Jun 25, 2021

State Coalition for Remediation of Drycleaners Listing: SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Government Publication Date: Nov 08, 2017

Integrated Compliance Information System (ICIS): ICIS

The Integrated Compliance Information System (ICIS) is a system that provides information for the Federal Enforcement and Compliance (FE&C) and the National Pollutant Discharge Elimination System (NPDES) programs. The FE&C component supports the Environmental Protection Agency's (EPA) Civil Enforcement and Compliance program activities. These activities include Compliance Assistance, Compliance Monitoring and Enforcement. The NPDES program supports tracking of NPDES permits, limits, discharge monitoring data and other program reports.

Government Publication Date: Jun 14, 2021

Drycleaner Facilities: FED DRYCLEANERS

A list of drycleaner facilities from Enforcement and Compliance History Online (ECHO) online search. The Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: May 5, 2021

Delisted Drycleaner Facilities: DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: May 5, 2021

Formerly Used Defense Sites: FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DoD) is responsible for an environmental restoration. This list is published by the U.S. Army Corps of Engineers.

Government Publication Date: May 26, 2021

Former Military Nike Missile Sites: FORMER NIKE

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

Government Publication Date: Dec 2, 1984

PHMSA Pipeline Safety Flagged Incidents: PIPELINE INCIDENT

A list of flagged pipeline incidents made available by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA regulations require incident and accident reports for five different pipeline system types.

Government Publication Date: Jul 7, 2020

Material Licensing Tracking System (MLTS): MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: May 11, 2021

Historic Material Licensing Tracking System (MLTS) sites: HIST MLTS

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File: MINES

The Master Index File (MIF) contains mine identification numbers issued by the Department of Labor Mine Safety and Health Administration (MSHA) for mines active or opened since 1971. Note that addresses may or may not correspond with the physical location of the mine itself.

Government Publication Date: Nov 3, 2020

Surface Mining Control and Reclamation Act Sites: SMCRA

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of Abandoned Mine Land (AML) impacts, as well as information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Government Publication Date: Dec 18, 2020

Mineral Resource Data System: MRDS

The Mineral Resource Data System (MRDS) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps.

Government Publication Date: Mar 15, 2006

Uranium Mill Tailings Radiation Control Act Sites: URANIUM

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

Government Publication Date: Mar 4, 2017

Alternative Fueling Stations: ALT FUELS

List of alternative fueling stations made available by the US Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Biodiesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE). The National Renewable Energy Laboratory (NREL) obtains information about new stations from trade media, Clean Cities coordinators, a Submit New Station form on the Station Locator website, and through collaborating with infrastructure equipment and fuel providers, original equipment manufacturers (OEMs), and industry groups.

Government Publication Date: Jul 12, 2021

Registered Pesticide Establishments: SSTS

List of active EPA-registered foreign and domestic pesticide-producing and device-producing establishments based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that facilities producing pesticides, active ingredients, or devices be registered. The list of establishments is made available by the EPA.

Government Publication Date: Apr 13, 2021

Polychlorinated Biphenyl (PCB) Notifiers: PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Nov 19, 2020

State

Dry Cleaning Facilities: DRYCLEANERS

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial, linen supply, commercial laundry, dry cleaning and pressing machines - Coin Operated Laundry and Dry Cleaning. This is provided by the Department of Toxic Substance Control.

Government Publication Date: Aug 27, 2021

Delisted Drycleaners: DELISTED DRYCLEANERS

Sites removed from the list of drycleaner related facilities that have EPA ID numbers, made available by the California Department of Toxic Substance Control.

Government Publication Date: Aug 27, 2021

Non-Toxic Dry Cleaning Incentive Program: DRYC GRANT

A list of grant recipients of the Non-Toxic Dry Cleaning Incentive Program made available by the California Air Resources Board (CARB). The program provides grants to eligible dry cleaning businesses to assist them in transitioning away from PERC machines to alternative non-toxic and non-smog forming technologies.

Government Publication Date: Feb 28, 2018

Per- and Polyfluoroalkyl Substances (PFAS): PFAS

List of sites from the State Water Resources Control Board (SWRCB)'s GeoTracker at which one or more of the potential contaminants of concern are in the PFAS Master List of PFAS Substances made available by the Environmental Protection Agency (US EPA).

Government Publication Date: Jun 22, 2021

PFOA/PFOS Groundwater: PFAS GW

A list of water wells from the Groundwater Ambient Monitoring and Assessment Program (GAMA) Groundwater Information System with the groundwater chemical perfluorooctanoic acid (PFOA) (NL = 0.014 UG/L) or perfluorooctanoic sulfonate (PFOS) (NL = 0.013 UG/L). The GAMA Groundwater Information System search is made available by California Water Boards.

Government Publication Date: Oct 22, 2020

Hazardous Waste and Substances Site List - Site Cleanup: HWSS CLEANUP

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. This list is published by California Department of Toxic Substance Control.

Government Publication Date: May 20, 2021

List of Hazardous Waste Facilities Subject to Corrective Action: DTSC HWF

This is a list of hazardous waste facilities identified in Health and Safety Code (HSC) § 25187.5. These facilities are those where Department of Toxic Substances Control (DTSC) has taken or contracted for corrective action because a facility owner/operator has failed to comply with a date for taking corrective action in an order issued under HSC § 25187, or because DTSC determined that immediate corrective action was necessary to abate an imminent or substantial endangerment.

Government Publication Date: Jul 18, 2016

EnviroStor Inspection, Compliance, and Enforcement: INSP COMP ENF

A list of permitted facilities with inspections and enforcements tracked in the Department of Toxic Substance Control (DTSC) EnviroStor.

Government Publication Date: Apr 29, 2021

School Property Evaluation Program Sites: SCH

A list of sites registered with The Department of Toxic Substances Control (DTSC) School Property Evaluation and Cleanup (SPEC) Division. SPEC is responsible for assessing, investigating and cleaning up proposed school sites. The Division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy the new school.

Government Publication Date: Jun 14, 2021

California Hazardous Material Incident Report System (CHMIRS): CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS). This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: Aug 1, 2021

Historical California Hazardous Material Incident Report System (CHMIRS): HIST CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS) prior to 1993. This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: Jan 1, 1993

Hazardous Waste Manifest Data: HAZNET

A list of hazardous waste manifests received each year by Department of Toxic Substances Control (DTSC). The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.
Government Publication Date: Oct 24, 2016

Historical Hazardous Waste Manifest Data: HIST MANIFEST
A list of historic hazardous waste manifests received by the Department of Toxic Substances Control (DTSC) from year the 1980 to 1992. The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.
Government Publication Date: Dec 31, 1992

DTSC Registered Hazardous Waste Transporters: HW TRANSPORT
The California Department of Toxic Substances Control (DTSC) maintains this list of Registered Hazardous Waste Transporters.
Government Publication Date: Oct 19, 2020

Registered Waste Tire Haulers: WASTE TIRE
This list of registered waste tire haulers is maintained by the California Department of Resources Recycling and Recovery.
Government Publication Date: Dec 16, 2020

California Medical Waste Management Program Facility List: MEDICAL WASTE
This list of Medical Waste Management Program Facilities is maintained by the California Department of Public Health. The Medical Waste Management Program (MWMP) regulates the generation, handling, storage, treatment, and disposal of medical waste by providing oversight for the implementation of the Medical Waste Management Act (MWMA). The MWMP permits and inspects all medical waste off-site treatment facilities, medical waste transporters, and medical waste transfer stations. This list contains transporters, treatment, and transfer facilities.
Government Publication Date: Dec 31, 2020

Historical Cortese List: HIST CORTESE
List of sites which were once included on the Cortese list. The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements for providing information about the location of hazardous sites.
Government Publication Date: Nov 13, 2008

Cease and Desist Orders and Cleanup and Abatement Orders: CDO/CAO
The California Environment Protection Agency "Cortese List" of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO). This list contains many CDOs and CAOs that do NOT concern the discharge of wastes that are hazardous materials. Many of the listed orders concern, as examples, discharges of domestic sewage, food processing wastes, or sediment that do not contain hazardous materials, but the Water Boards' database does not distinguish between these types of orders.
Government Publication Date: Jul 19, 2020

California Environmental Reporting System (CERS) Hazardous Waste Sites: CERS HAZ
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.
Government Publication Date: Sep 24, 2021

Delisted Environmental Reporting System (CERS) Hazardous Waste Sites: DELISTED HAZ
This database contains a list of sites that were removed from the California Environmental Protection Agency (CalEPA) in the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator.
Government Publication Date: Nov 29, 2018

Sites in GeoTracker: GEOTRACKER
GeoTracker is the State Water Resource Control Boards' data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. This is a list of sites in GeoTracker that aren't otherwise categorized as LUST, Land Disposal Sites (LDS), Cleanup Sites, or sites having Waste Discharge Requirements (WDR). This listing includes program types such as Underground Injection Control (UIC), Confined Animal Facilities (CAF), Irrigated Lands Regulatory Program, plans, and non-case information.
Government Publication Date: Jun 22, 2021

Mines Listing: MINE

This list includes mine site locations extracted from the Mines Online database, maintained by the California Department of Conservation. Mines Online (MOL) is an interactive web map designed with GIS features that provide information such as the mine name, mine status, commodity sold, location, and other mine specific data. Please note: Mine location information is provided to assist experts in determining the location of mine operators in accordance with California Civil Code section 1103.4 and reflects information reported by mine operators in annual reports provided under Public Resources Code section 2207. While the Division of Mine Reclamation (DMR) attempts to populate MOL with accurate location information, the DMR cannot guarantee the accuracy of operator reported location information.

Government Publication Date: Jan 12, 2021

Recorded Environmental Cleanup Liens: LIEN

The California Department of Toxic Substance Control (DTSC) maintains this list of liens placed upon real properties. A lien is utilized by the DTSC to obtain reimbursement from responsible parties for costs associated with the remediation of contaminated properties.

Government Publication Date: Nov 16, 2020

Waste Discharge Requirements: WASTE DISCHG

List of sites in California State Water Resources Control Board (SWRCB) Waste Discharge Requirements (WDRs) Program in California, made available by the SWRCB via GeoTracker. The WDR program regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Government Publication Date: Jun 22, 2021

Toxic Pollutant Emissions Facilities: EMISSIONS

A list of criteria and toxic pollutant emissions data for facilities in California made available by the California Environmental Protection Agency - Air Resources Board (ARB). Risk data may be based on previous inventory submittals. The toxics data are submitted to the ARB by the local air districts as requirement of the Air Toxics "Hot Spots" Program. This program requires emission inventory updates every four years.

Government Publication Date: Dec 31, 2019

Clandestine Drug Lab Sites: CDL

The Department of Toxic Substances Control (DTSC) maintains a listing of drug lab sites. DTSC is responsible for removal and disposal of hazardous substances discovered by law enforcement officials while investigating illegal/clandestine drug laboratories.

Government Publication Date: Jan 19, 2021

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental databases were selected to be included in the search.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX C
HISTORICAL RESOURCES

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**2018** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**2012** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

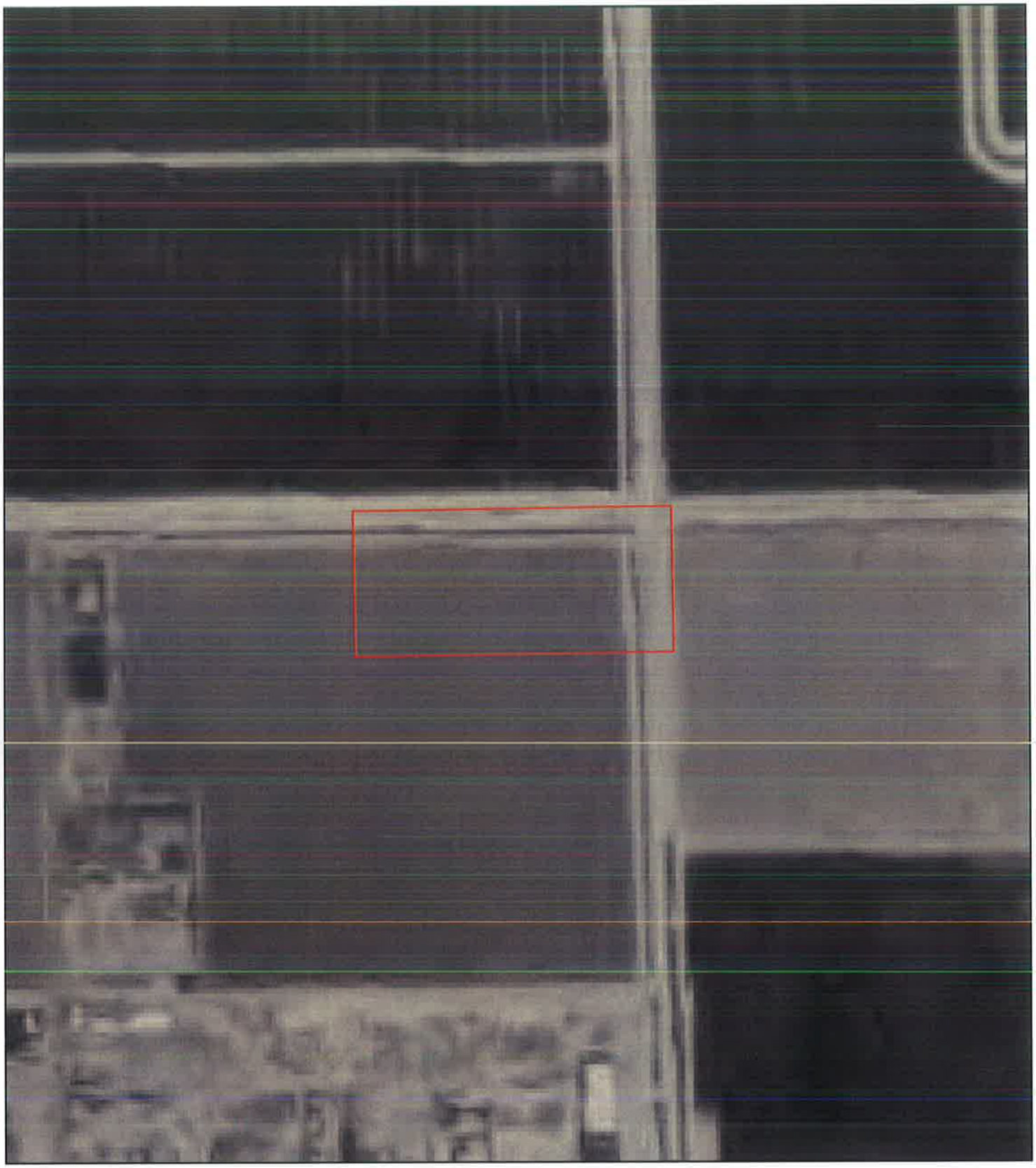
185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**2009** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**2002** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1996** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG



Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1984** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1979** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1976** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

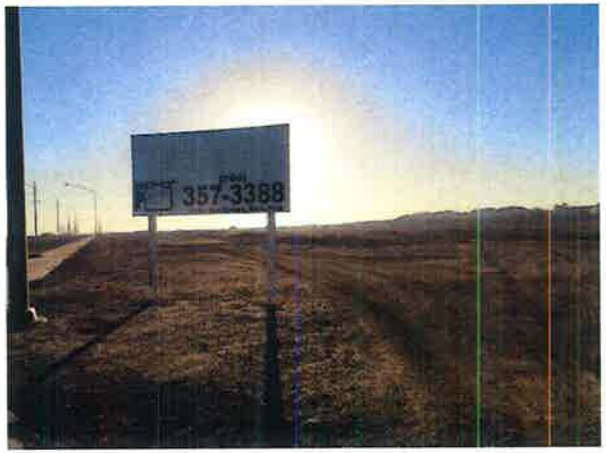
Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1969** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 9,600 (1"=800') www.historicalinfo.com	HIG

Site boundaries shown in red are approximate

185 Willowbrook Way 185 Willowbrook Way Heber, CA	N	**1952** HIG Project # 2036558 Client Project # 20-120SD Approximate Scale 1: 6,000 (1"=500') www.historicalinfo.com	HIG

APPENDIX D
PHOTOGRAPHS



1. Site Signage – 185 Willowbrook Way -- Looking east southeast.

2. The Site looking southeast.

3. The Site looking east.

4. The Site looking northeast.

5. The Site looking north.

6. The Site looking northwest.

7. The Site looking west.

8. The Site looking south.

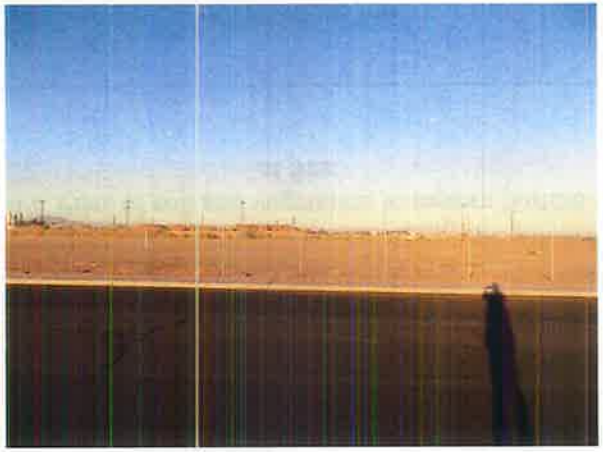
9. Various debris on Site.

10. Concrete debris in south portion of Site.

11. Piles of soil and vegetation in eastern portion of Site.

12. Utility infrastructure in northern portion of Site.

13. Northwest adjacent.



14. West adjacent (retention basin).

15. Southwest adjacent.

16. South adjacent.

17. Southeast adjacent.

18. East adjacent.

19. Northeast adjacent.

20. North adjacent.

21. Northwest adjacent.

APPENDIX E
INTERVIEW QUESTIONAIRRE

Due Diligence Environmental Questionnaire - ***Owner***

Site Name
Heber Meadows
185 Willowbrook Way
Heber, California 92249

Return to dw@weisenviro.com

Completed by: David Davis

Company or Organization: Chelsea Investment

Title Development Manager

Date: 10-22-2021

1.) Who is the current owner of the subject property and when was it purchased?

Heber Meadows Land Holding, LLC

2.) Who are the past owners of the property and years of ownership (if available)?

Luther B. Hester & Helen L. Hester

3.) What was the past use of the subject property?

Agriculture

4.) Are you aware of any environmental cleanup liens that are filed or recorded against the subject property?

No

5.) Are you aware of any activity and land use limitations that are in place on the property that have been filed or recorded in a registry?

No

6.) Are you aware of any specialized knowledge or experience related to the property or nearby properties that is pertinent to potential adverse environmental conditions?

No

7.) Are you aware of commonly known or reasonably obtainable information that would help us to identify conditions indicative of releases or threatened releases of hazardous wastes/materials at the property? Such information includes knowledge of specific chemicals that are present or were once present on the property, spills or other chemicals releases that may have occurred, underground or aboveground storage tanks and environmental cleanups that have been conducted on the property.

No

8.) Based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

No

APPENDIX F
QUALIFICATIONS

Dan Weis, R.E.H.S.

ENVIRONMENTAL MANAGER

1938 Kellogg Avenue, Suite 116, Carlsbad, CA 92008

(760) 585-7070 // (760) 672-6338 // dw@weisenviro.com // www.weisenviro.com

Professional Summary

Environmental Manager and California Registered Environmental Health Specialist with extensive expertise in environmental science and assessment, environmental and public health, risk assessment, health and safety, remedial design and implementation, strategic planning and project/program design and implementation. Over 20 years of professional experience and achievement. Successful completion of projects for a wide range of clientele including, but not limited to, local government entities, developers (affordable housing and market rate), educational institutions, Federal government entities, law firms, architectural and engineering firms, lending institutions, life insurance companies, conservancies, commercial/industrial real estate owners/managers, insurance companies, wireless telecommunication carriers and real estate developers. Extensive experienced in the completion of assessment, construction and remediation quality assurance during the completion of urban redevelopment/brownfields projects and public works projects, many of which have been located in downtown areas of San Diego, Los Angeles, Oakland, San Francisco, and other urban communities throughout the State of California. Proven ability to train and mentor professional, technical and support staff. Manages a comprehensive health and safety program. Holds a Master of Science in Public Health with an emphasis in environmental health science, risk assessment, health and safety, toxicology and environmental policy. Registered Environmental Health Specialist #8172 in the State of California.

Education and Professional Certification

- University of Delaware, Bachelor of Arts, 1995
- San Diego State University, Master of Science, Public/Environmental Health, 2001
- State of California Registered Environmental Health Specialist #8172
- Centers for Disease Control and Prevention National Center for Environmental Health Division of Emergency and Environmental Health Services - Environmental Health Training in Emergency Response
- Occupational Safety and Health Administration (OSHA) 40 Hour Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) Training and Annual 8 Hour HAZWOPER Refresher Training
- OSHA 8 Hour HAZWOPER Supervisor Training

Relevant Skills and Qualifications

- Proven ability to manage staff and programs/projects in challenging and diverse environments and regulatory settings. Consistently meets project schedules, goals, deadlines and budgetary restrictions.
- Completed or managed over 3,000 due diligence related environmental assessments and completed or managed over 500 subsurface environmental investigations of soil gas, soil, groundwater and other media. Investigations have included human health and ecological risk assessments, evaluations of indoor air conditions based on interpretations of subsurface conditions, underground storage tank (UST) evaluation/closure and hazardous waste characterization/management. Subsurface activities performed include the completion of soil borings using various drilling technologies, soil and groundwater sampling, installation and sampling of groundwater monitoring wells, free product evaluations, exploratory trenching and real-time delineation using mobile analytical laboratories and other soil screening technology.
- Managed over 100 remediation or construction management related projects primarily related to source removal of subsurface contaminants, including but not limited to, petroleum hydrocarbons, chlorinated solvents, heavy metals, organochlorine pesticides and other agricultural related chemicals, dioxins and furans and polychlorinated biphenyls. Has also assisted in cost recovery efforts from private parties and State/Federal funding programs for environmental assessment and remediation work and has served as an expert witness during legal proceedings pertaining to environmental related claims.
- Strong collaboration and negotiation skills with environmental regulatory agencies regarding project planning, initiation, status, approvals and implementation. Direct experience in interfacing with members of regulatory agencies including but not limited to the United States Environmental Protection Agency (EPA), California EPA Department of Toxic Substances

Control and Office of Environmental Health Hazard Assessment, County of San Diego Departments of Environmental Health (DEH), Public Works and Planning and Land Use, San Diego Air Pollution Control District, South Coast Air Quality Management District, Riverside County DEH, San Francisco City and County Department of Public Health (DPH), Arizona Department of Environmental Quality, County of Los Angeles County DPH and other local Certified Unified Program Agencies. Develop, manage and implement compliance and best practices efforts with Federal and State laws and regulations.

- Conducted and/or managed hundreds of public/environmental health related assessments including electromagnetic field surveys, radionuclide surveys, indoor air quality investigations, radon surveys, drinking water assessments, asbestos containing materials and lead-based paint surveys and mold/microbial evaluations.
- Recovered over $10,000,000 of assessment and cleanup costs for clientele from various sources including State of California Cleanup Funds, United States Environmental Protection Agency Brownfield grants and private parties including major oil companies.
- Responsible for facilitating a safe and healthy work environment in concert with the mission of the company while ensuring compliance with applicable Federal, State, and local regulations.
- Published technical papers pertaining to geogenic concentrations of metals in San Diego County, radioactive dating and pollutant chronologies in estuarine sediments and various urban runoff related implications.
- Delivered presentations pertaining to various environmental topics including human health risk assessment to membership at local and national trade conferences

Project Experience (Projects Completed at Multiple Firms)

- 14th and Island, San Diego, California – Development of Site Mitigation Plan, contaminated soil management and disposal concurrent with site construction activities at the superblock construction site in downtown San Diego and achievement of regulatory closure with the County of San Diego Department of Environmental Health.
- 2198 Market Street, San Francisco, California – Phase I and II Environmental Site Assessments, supplemental subsurface investigation, Site Mitigation Plan development, contaminated soil management and disposal concurrent with site construction activities and negotiation/achievement of regulatory closure with the City of San Francisco Department of Public Health.
- Former EZ Serve, 9305 Mission Gorge Road, Santee, California – Closure report preparation and San Diego Regional Water Quality Control Board interface and negotiation/achievement of regulatory closure under State of California low-threat policy.
- French Field – Former Vista Burn Dump, Oceanside, California – Oversight of the capping of a former burn dump/landfill facility and restoration for public use as a sports facility. Negotiation and achievement of regulatory closure with the California Department of Toxic Substances Control with concurrence from the San Diego Regional Water Quality Control Board and the County of San Diego Local Enforcement Agency.
- Indoor Skydiving Facility, 1401 Imperial Avenue, San Diego, California – Development of Soil Management Plan and contaminated soil management and disposal concurrent with site construction activities in downtown San Diego.
- Lemon Grove Avenue Realignment Project, Lemon Grove, California – Development of Impacted Soil Management Plan, Community Health and Safety Plan and Worker Health and Safety Plan and oversight of the implementation of such plans during construction activities.
- North Side Interior Road and Utilities Project at San Diego International Airport, San Diego, California - Subsurface assessment, development of Soil Management Plan and Work Health and Safety Plan and implementation and monitoring of soil management strategies.
- Olympic and Hill, Los Angeles, California – Removal of multiple underground storage tanks and underlying contaminated soil and achievement of regulatory closure with the City of Los Angeles Fire Department.
- San Ysidro - U.S. Land Port of Entry, San Diego, California – Subsurface assessment and development and implementation of soil management strategies.
- VA Medical Center Long Beach, 5901 East 7th Street, Long Beach, California - VA Long Beach: Seismic Corrections – Mental Health, Community Living Center and Chiller Replacements Project – Asbestos containing materials and lead-based paint surveys and preparation of abatement contractor bid specifications.

Attachment "G"

Preliminary Hydrology Study

For

Tract 00992

Miraluz – Heber, CA

Pitzer and Corral

Heber, CA

Prepared for:

Chelsea Development

C/O Dave Davis

6339 Paseo Del Lago,

Carlsbad, CA 92011

Prepared by:

Egan Civil, Inc.

Benjamin Daniel Egan, PE, PLS

42945 Madio Street, Suite A

Indio, CA 92201

(760) 404-7663

began@egancivil.com

Prepared 3/24/2021

Introduction

This report has been prepared to review Hydrologic Conditions associated with the proposed Miraluz Development – Tract 00992. The Development is located in the townsite of Heber, east of Bloomfield, south of Corral and west of Pitzer. The site consists of approximately 16.22 net acres of undeveloped land.

Project Location and Surroundings

The site is located within the Master Planned Tract 00956 – Heber Meadows, and existing improvements consist of full road improvements on Bloomfield, and half road improvements on Corral and Pitzer, including street, curb and gutter, sidewalk, water, sewer and storm drain. The master planned development is designed to collect and store all stormwater runoff in an existing retention basin on the west side of Bloomfield, south of Corral, approximately 6.9 acres in size.

Method and Approach

Records were collected for the existing Master Planned Tract 00956 development. Multiple inquiries were made for the Final Hydrology Study, and a copy was not able to be located. A preliminary study was located and provided, and is included in **Appendix C** of this report.

A complete aerial survey of the entire proposed project limits was collected, and then augmented with complete survey of the existing West Retention Basin. The surveyed contours for the basin were used to determine is capacity, and calculations for this are included in **Appendix B.**

Improvement Plans were requested, and a number of improvement plans were provided. Relevant Improvement plans were mapped into the survey base file and are depicted on the attached Hydrology Map, Tentative Tract Map and Conceptual Grading Plan in **Appendix A.** These items were used to analyze the hydrologic characteristics of the existing conditions, confirm the conclusions of the original Master Plan Preliminary Hydrology Study, and analyze the proposed development conditions.

Hydrology and Runoff Volume Determination

The Heber Utility District Engineer directed that a design storm of 3 total of inches of rainfall, with no c factor reduction, be utilized to determine the stormwater retention requirements. Using this method, the total flood volume is found by the equation V = A x (I/12) where V is the total volume to be retained in cubic feet, A is the site area in square feet, and I is the rainfall in inches.

The proposed development area is calculated as follows:

A = 18.77 acres (817,557 square feet)

I = 3 inches (3/12 = 0.25 feet)

V = 817,557 x 0.25 = 204,389 cubic feet.

The existing completed areas of the site, and areas for future development are calculated as follows:

A = 56.14 acres (2,445,523 square feet)

I = 3 inches (3/12 = 0.25 feet)

V = 2,445,523 x 0.25 = 611,381 cubic feet.

The area of the existing West Retention Basin (Retention Basin #1) is calculated as follows:

A = 6.9 acres (300,610 square feet)

I = 3 inches (3/12 = 0.25 feet)

V = 300,610 x 0.25 = 75,152 cubic feet.

The total runoff from the entire project at full buildout that is tributary to the existing westerly retention basin is therefore:

V total = 204,389 + 611,381 + 75,152 = 890,922 cubic feet (20.46+/- acre feet)

The existing basin was surveyed and found to have a capacity of 20.90 acre feet as more thoroughly described in the Retention Basin sizing section of this Report. The basin is adequately sized to contain the runoff from the entire project, including all existing prior development, currently proposed development, and future development. A Hydrology Map depicting the drainage area's and locations of features can be found in **Appendix A.** Calculations for the volume of the existing basin can be found in **Appendix B.**

Retention Basin Sizing

Analysis of the existing West Retention Basin (Retention Basin #1) is as follows: Pages 58 and 59 of the Master Tract 00956 Preliminary Hydrology Study (Appendix C) indicate a similar design method of 3" of total rain over the entire site, which said report lists as 86.17 acres. This number generally agrees with the area of 84.85 acres determined during preparation of the hydrology map. Said preliminary report indicated a total required storage volume of 938,391 cubic feet. This number exceeds our calculation of 891,238 cubic feet of storage being required, but does not account for the area in Pitzer Road being stored in a basin that was graded on the east side of the site. By survey and analysis we have confirmed the existing retention basin volume to be 910,386 cubic feet, which is adequate to retain the calculated runoff from the adjusted tributary areas.

Analysis of the existing East Retention Basin is as follows: The Master Tract 00956 Preliminary Hydrology Study (Appendix C) does not mention the easterly basin. Improvement Plans provided clearly show storm drain infrastructure in Pitzer being routed to this basin. The improvement plans do not specifically address the sizing of the basin. By survey and analysis, it has been determined that the existing east retention basin to have a capacity of 0.36 acre feet. This falls short of the value of 0.76 acres feet of runoff that calculation indicate need to be stored in the basin from Pitzer Road. It is proposed to enlarge the basin to properly accommodate the runoff from Pitzer Road as well as from proposed improvements at the Pitzer and 86 intersection.

Summary

The design incorporates the project into the existing master plan facilities and is in compliance with currently adopted agency policy. This should allow the approving agency to advance the project through.

Appendix A

Hydrology Map

Conceptual Grading Plan

Tentative Tract Map

TRACT 00992 - MIRALUZ
HYDROLOGY MAP

UPDATED MARCH 24, 2021

RUNOFF TABULATION

WEST BASIN

DESCRIPTION	DESIGNATION	LAND AREA	RUNOFF VOLUME
ORIGINAL DEVELOPMENT	AREA "A"	56.14 ACRES	14.04 ACRE FEET
PROPOSED DEVELOPMENT	AREA "B"	18.77 ACRES	4.69 ACRE FEET
RETENTION BASIN #1 (EX)	AREA "C"	6.90 ACRES	1.73 ACRE FEET
TOTAL RUNOFF FROM ALL AREAS		81.81 ACRES	20.46 ACRE FEET
BASIN 1 CAPACITY AT CONTOUR 983			20.90 ACRE FEET.

EAST BASIN

DESCRIPTION	DESIGNATION	LAND AREA	RUNOFF VOLUME
PITZER ROAD	AREA "D"	2.56 ACRES	0.64 ACRE FEET
RETENTION BASIN #2 (EX)	AREA "E"	0.48 ACRES	0.12 ACRE FEET
TOTAL RUNOFF FROM ALL AREAS		3.04 ACRES	0.76 ACRE FEET
BASIN 2 CAPACITY AT CONTOUR 985			0.36 ACRE FEET

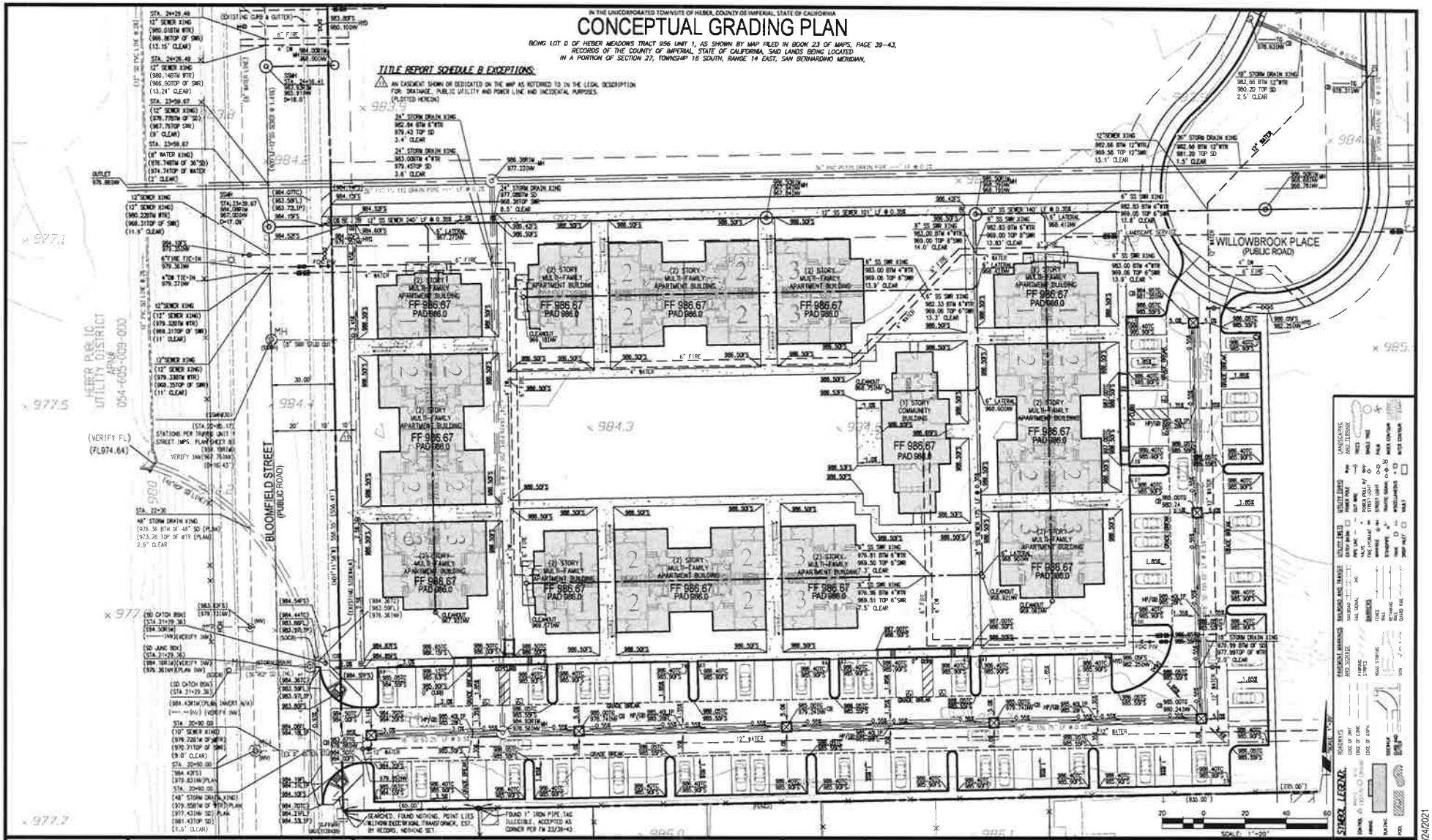
IN THE UNINCORPORATED TOWNSITE OF HEBER, COUNTY OF IMPERIAL, STATE OF CALIFORNIA

CONCEPTUAL GRADING PLAN

BEING LOT 0 OF HEBER MEADOWS TRACT 956 UNIT 1, AS SHOWN BY MAP FILED IN BOOK 23 OF MAPS, PAGE 39-43, RECORDS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA. SAID LANDS BEING LOCATED IN A PORTION OF SECTION 27, TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN.

TITLE REPORT SCHEDULE B EXCEPTIONS:

⚠ AN EASEMENT SHOWN OR DEDICATED ON THE MAP AS REFERRED TO IN THE LEGAL DESCRIPTION FOR: DRAINAGE, PUBLIC UTILITY AND POWER LINE AND INCIDENTAL PURPOSES. (PLOTTED HEREON)



DIGALERT — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

MARK	DATE	REVISIONS	APPD	DATE

BENCHMARK: [illegible] STAMPED "T 12S R 14E" LOCATED 2.0± MILES EAST ALONG HILTON ROAD FROM SILSBEE ROAD AT EL CENTRO. THENCE 4.3± MILES SOUTH ALONG STATE HIGHWAY 111, AT THE NORTHEAST CORNER OF JUNCTION OF HIGHWAY 86 & 111 EAST EAST OF THE CENTERLINE OF THE EAST LANES OF THE HIGHWAY, 36.0 FEET EAST OF THE CENTERLINE OF THE EAST FRONTAGE ROAD, 42 FEET NORTH OF THE CENTERLINE OF HIGHWAY 86 AND 4.0 FEET SOUTH OF NORTH END OF THE EAST CONCRETE HEADWALL OF THE WEST CULVERT UNDER THE FRONTAGE ROAD, ABOUT 12 MILES WITH THE FRONTAGE ROAD, ELEVATION IN FEET [illegible] ON THE CENTERLINE OF THE EAST FRONTAGE ROAD, AT POINT OF BEGINNING: THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA COORDINATE SYSTEM ESTABLISHED, ZONE 6, AS AN ASSUMED LOCALITY BY THE LINE BETWEEN CONTINUOUS OPERATING GPS BASE STATION STATIONS THAR AND PINS, STATION DESIGNATIONS, AS COMPUTED AND PUBLISHED BY SCRIPPS ORBIT AND PERMANENT ARRAY CENTER (SOPAC) AND THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC), BEING NORTH 42°48'46.17" EAST.

ABBREVIATIONS:

C/L	CENTERLINE	I.P.	IRON PIPE	SDMH	STORM DRAIN MANHOLE
COR.	CORNER	M.B.	MAP BOOK	SSMH	SAN. SEWER MANHOLE
℄	EAST	MON.	MONUMENT	TC	TOP OF CURB
EG	EXISTING GROUND	N	NORTH	TCOL	TOP OF COLUMN
FL	FLOW LINE	REF.	REFERENCE	TW	TOP OF WALL
FS	FINISH SURFACE	R/W	RIGHT-OF-WAY	VLV	VALVE
GPS	GLOBAL POS. SYSTEM	RS	RECORD OF SURVEY	W	WEST
HYD.	FIRE HYDRANT	P.M.B.	PARCEL MAP BOOK	WM	WATER METER
		S	SOUTH	(XX.XX)	EXISTING ELEVATION
		SEC.	SECTION		CALLOUT

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — NO. 73070 — CIVIL — 03/24/2021

EGAN CIVIL, INC.
PREPARED UNDER THE DIRECT SUPERVISION OF
(760) 434-1625 WWW.EGANCIVIL.COM

HEBER MEADOWS CIC, LP
6335 PASEO DEL LAGO
CARLSBAD, CA 92011
CARE OF: DAVE DAVIS
760-456-6000 EXT. 173

UNINCORPORATED TOWNSITE, COUNTY OF IMPERIAL, STATE OF CALIFORNIA
185 WILLOWBROOK WAY #1
HEBER, CA 92249

TENTATIVE TRACT MAP 00922
PARCEL 1 CONCEPTUAL GRADING PLAN
VACANT LAND
FOR: CHELSEA DEVELOPMENT

SHEET 1 OF 1 SHEETS
FILE NO. 20190367

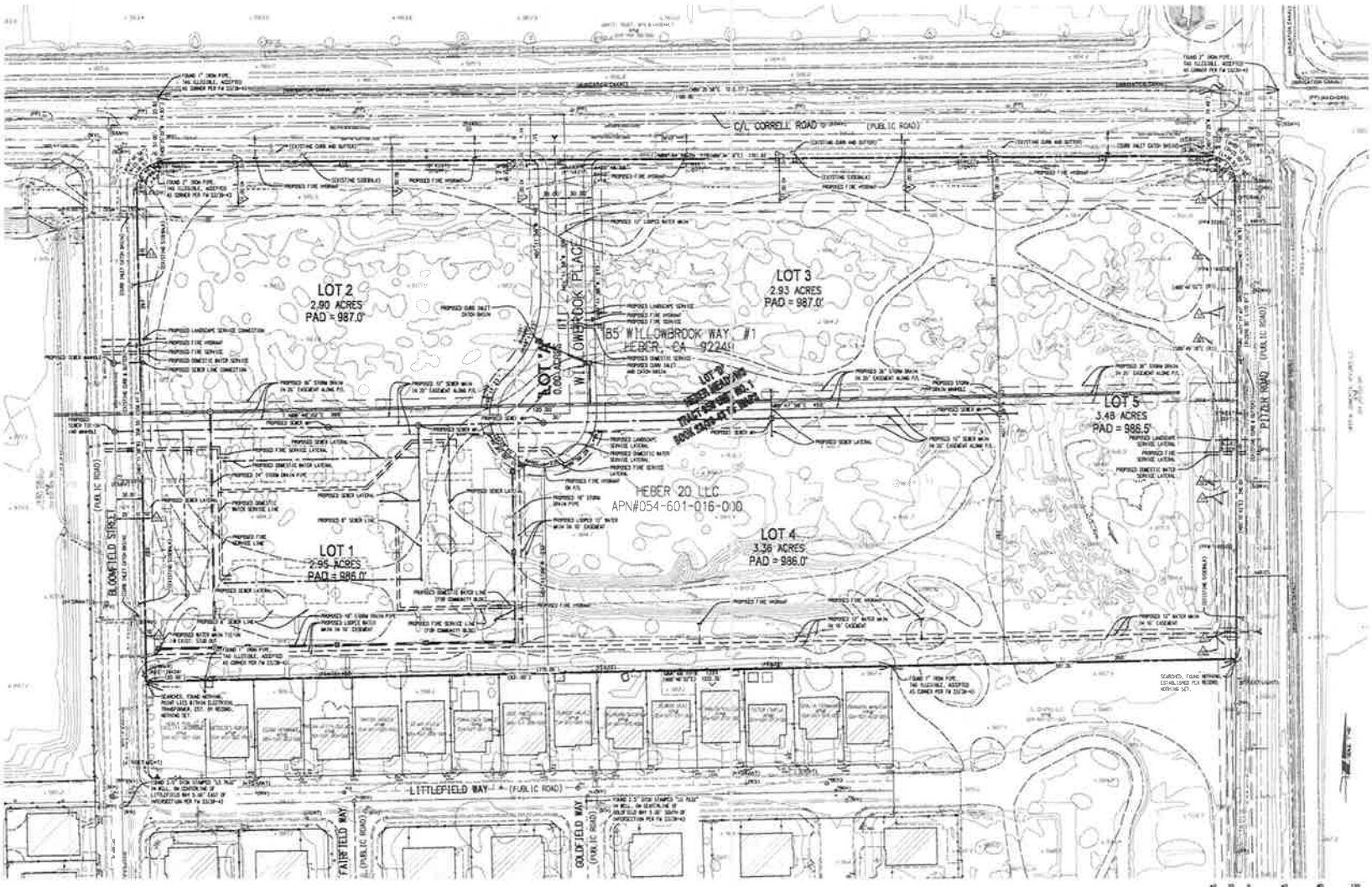
EXHIBIT PRINTED 03/24/2021

IN THE UNINCORPORATED TOWNSITE OF HEBER, COUNTY OF IMPERIAL, STATE OF CALIFORNIA

TENTATIVE TRACT MAP NO. 00992

BEING LOT D OF HEBER MEADOWS TRACT 936 UNIT 1, AS SHOWN BY MAP FILED IN BOOK 33 OF MAPS, PAGE 39-43, RECORDS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, SAID LANDS BEING LOCATED IN A PORTION OF SECTION 27, TOWNSHIP 16 SOUTH, RANGE 14 EAST, SAN BERNARDINO MERIDIAN.

BENJAMIN DANIEL EGAN, P.L.S. 8758 DATE OF SURVEY: SEPTEMBER 2019



OWNER/APPLICANT:

HOMES BY ADKINS CIVIC, LP
CARE OF: DAVE DAVIS
6334 PASEO DEL LAGO
CARLSBAD, CA 92011

APN AND LEGAL DESCRIPTION:

REAL PROPERTY IN THE UNINCORPORATED AREA OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

LOT D, OF HEBER MEADOWS TRACT 936 UNIT NO. 1, IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 33, PAGES 39 THROUGH 43 INCLUSIVE OF FINAL MAPS, RECORDS OF IMPERIAL COUNTY, CALIFORNIA.

EXCEPTING THEREFROM ALL MINERAL NATURALLY AND NOT AS A ROYALTY INTEREST, ONE HUNDRED PERCENT (100%) OF ALL OIL, GAS AND OTHER HYDROCARBONS, GEOTHERMAL RESOURCES AND DEFINED IN SECTION 6903 OF THE CALIFORNIA PUBLIC RESOURCES CODE AND ALL OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT, WITHIN OR THAT MAY BE PRODUCED FROM SAID REAL PROPERTY BELOW A DEPTH OF 500 FEET AND TO PERMANENTLY, SOLELY, STORE AND REMOVE FROM OR THROUGH SUCH WELL OR WELLS, OIL, GAS AND OTHER SUBSTANCES OF WHATEVER NATURE, INCLUDING THE RIGHT TO PERFORM ANY AND ALL OPERATIONS DEEMED BY THE IRVINE COMPANY NECESSARY OR CONVENIENT FOR THE EXERCISE OF SUCH MINERAL RIGHTS, THEN TO THE THEN OWNER OF THE REAL PROPERTY DESCRIBED HEREINABOVE TO BEAR (PARTY), WARRANTY (QUARTZ), TOUR (QUARTZ) AND OTHER (QUARTZ), AS RESERVED BY THE IRVINE COMPANY, A MICHIGAN CORPORATION IN DEED RECORDED JULY 28, 1982 AS INSTRUMENT NO. 102 IN BOOK 1305, PAGE 1312 OF OFFICIAL RECORDS.

APN: 054-601-016-000

TITLE REPORT SCHEDULE B EXCEPTIONS:

1. SEASONAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2020-2021, A LIEN NOT YET DUE OR PAYABLE. (THIS ITEM IS NOT PLOTTABLE)
2. SEASONAL AND SPECIAL TAXES AND ASSESSMENTS FOR THE FISCAL YEAR 2019-2020. FIRST INSTALLMENT: $5,812.60, PAID
   PENALTY: $0.00
   SECOND INSTALLMENT: $5,812.60, OPEN
   PENALTY: $0.00
   TAX RATE AREA: 049002
   A. P. NO.: 054-601-016-000
   (THIS ITEM IS NOT PLOTTABLE)
3. ASSESSMENT LIENS, IF APPLICABLE, COLLECTED WITH THE SEVERAL AND SPECIAL TAXES, INCLUSIVE BUT NOT LIMITED TO THOSE DISCLOSED BY THE NOTATION OF THE FOLLOWING ON THE TAX ROLL:
   NO % BOND FOR CLOSED 2014 ASSESSMENT DISTRICT NO. 0
   NO % BOND FOR CLOSED 2016 SEWER DISTRICT NO.
   NO % BOND FOR HEBER CLEAN WATER DISTRICT NO.
   NO % BOND FOR HEBER CSD BOND DISTRICT NO.
   NO % BOND FOR IMP CSM COLLEGE DISTRICT NO.
   (THIS ITEM IS NOT PLOTTABLE)
4. THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO CHAPTER 3.5 COMMENCING WITH SECTION 75 OF THE CALIFORNIA REVENUE AND TAXATION CODE. (THIS ITEM IS NOT PLOTTABLE)
5. COVENANTS, CONDITIONS AND RESTRICTIONS AS CONTAINED IN DEED, RECORDED IN BOOK 330, PAGE 71 OF DEEDS, RECORDS OF SAN DIEGO. (THIS ITEM IS NOT PLOTTABLE)
6. AN EASEMENT FOR CONSTRUCTION, MAINTENANCE AND/OR USE OF A CANAL, TELEPHONE AND/OR ELECTRIC POWER LINE, OR LINES AND INCIDENTAL PURPOSES, RECORDED JANUARY 22, 1944 AS BOOK 812, PAGE 331 OF OFFICIAL RECORDS.
   IN FAVOR OF: IMPERIAL IRRIGATION DISTRICT
   AFFECTS: AS DESCRIBED THEREIN
   THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.
7. THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "AGREEMENT REGARDING AN OUTLET FOR WASTE WATER" RECORDED MAY 10, 1963 AS INSTRUMENT NO. 8 IN BOOK 938, PAGE 1 OF OFFICIAL RECORDS. (THIS ITEM IS NOT PLOTTABLE)
8. AN EASEMENT FOR CANAL, TELEPHONE AND/OR ELECTRIC POWER LINE OR LINES AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 27, 1964 AS INSTRUMENT NO. 8 IN BOOK 1018, PAGE 585 OF OFFICIAL RECORDS.
   IN FAVOR OF: IMPERIAL IRRIGATION DISTRICT
   AFFECTS: AS DESCRIBED THEREIN
   (PLOTTED HEREON)
9. AN EASEMENT FOR TRANSPORTATION OF THE WATER IN A DITCH OR PIPE LINE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 31, 1962 AS INSTRUMENT NO. 34 IN BOOK 1126, PAGE 441 OF OFFICIAL RECORDS.
   IN FAVOR OF: HARRY E. RICE
   AFFECTS: AS DESCRIBED THEREIN
   (THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.)
10. SUCH RIGHTS AS THE CALIFORNIA DEVELOPMENT COMPANY, NOW KNOWN AS THE IMPERIAL IRRIGATION DISTRICT, MAY HAVE ACQUIRED FOR RIGHT OF WAY UNDER THE ACT OF MARCH 3, 1891 (26 STAT., 1095) AS SET FORTH IN BOOK 1 OF ROAD DEEDS, PAGE 1, AND APPROVAL OF MAPS OF DEFINITE LOCATION BY THE DISTRICT LAND OFFICE, PRIOR TO THE DISPOSITION OF SAID LAND BY THE UNITED STATES OF AMERICA, LYING WITHIN THE BOUNDS OF:
    CENTRAL 3-D DRAIN
    DAFFODIL CANAL
    CENTRAL 3-D NO. 1
    (PLOTTED HEREON)
11. AN EASEMENT SHOWN OR DEDICATED ON THE MAP AS REFERRED TO IN THE LEGAL DESCRIPTION FOR ORDINANCE, PUBLIC UTILITY AND POWER LINE AND INCIDENTAL PURPOSES. (PLOTTED HEREON)
12. THE TERMS AND PROVISIONS CONTAINED IN THE DOCUMENT ENTITLED "MEMORANDUM OF CONFIDENTIAL DISCLOSURE AGREEMENT" RECORDED DECEMBER 05, 2008 AS INSTRUMENT NO. 08-49008 OF OFFICIAL RECORDS. (THIS ITEM IS NOT PLOTTABLE)
13. AN OPTION IN FAVOR OF SAGE NEW INVESTMENT CORPORATION, A CALIFORNIA CORPORATION AS CONTAINED IN OR EVIDENCED BY A DOCUMENT RECORDED SEPTEMBER 27, 2018 AS INSTRUMENT NO. 20-18548 OF OFFICIAL RECORDS. (THIS ITEM IS NOT PLOTTABLE)
14. WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS. (THIS ITEM IS NOT PLOTTABLE)
15. RIGHTS OF PARTIES IN POSSESSION. (THIS ITEM IS NOT PLOTTABLE)

THERE IS NO EXCEPTION OF ANY FAILURE OF TITLE HEREUNDER. THE COMPANY WILL REMOVE:

16. ITEM 16 REFERS TO TITLE COMPANY REQUIREMENTS WITH RESPECT TO PROVIDING EVIDENCE OF SIGNING AUTHORITY FOR HEBER 20, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY

DATUM STATEMENT:

COORDINATES ON LANDMARK HEREON ARE IN TERMS OF THE CALIFORNIA COORDINATE SYSTEM (CCS83) ZONE 6, (EPOCH 2017.50), BASED UPON THE FOLLOWING CONTROLLING CPS CONTROL STATIONS AS PUBLISHED BY SCRIPPS ORBIT AND PERMANENT ARRAY CENTER (SOPAC) AND THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC):

PHIN N: 1,853,522.442 E: 6,762,788.184
PTN N: 1,882,857.154 E: 6,788,479.910

COORDINATES SHOWN HEREON ARE EXPRESSED IN TERMS OF THE US SURVEY FOOT.

DISTANCES SHOWN HEREON ARE GROUND UNLESS NOTED OTHERWISE.

TO CONVERT GRID MEASURED DISTANCES TO GROUND DISTANCES, DIVIDE GRID DISTANCE BY (.9999914961) COMBINED FACTOR TO OBTAIN GROUND DISTANCE.

CALCULATIONS FROM GRID TO GROUND VALUES AND CONVERGENCE ANGLE FOR THIS SURVEY WERE MADE BY COORDINATES OF N. 1,840,588.318, E. 6,769,865.336, (BASIS AND ELEVATION OF -13.778 FEET(NAVD88))

RECORD DATA:

() DENOTES RECORD DATA PER MAP FILED IN BOOK 33, PAGES 39 TO 43 OF FINAL MAPS

MONUMENT NOTES:

◎ DENOTES FOUND MONUMENT PER MAP FILED IN BOOK 33, PAGES 39 TO 43 OF FINAL MAPS

FLOOD ZONE:

THE SUBJECT PROPERTY IS DEPICTED ON FEDERAL EMERGENCY MANAGEMENT AGENCY, NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP NUMBER 06025C, EFFECTIVE SEPTEMBER 26, 2008 AND IS LOCATED IN COMMUNITY NUMBER 060030 "IMPERIAL COUNTY, UNINCORPORATED AREAS", MAP PANEL 2015 SUFFIX C. SAID MAP DEPICTS PROPERTY AS BEING LOCATED WITHIN "ZONE X" - "AREAS OF MINIMAL FLOOD HAZARD"

TITLE REPORT NOTE:

THE INFORMATION IN THIS SURVEY IS BASED SOLELY ON THE FOLLOWING PRELIMINARY TITLE COMMITMENT PREPARED BY FIRST AMERICAN TITLE COMPANY, ORDER NUMBER NHSC-6160357, DATED FEBRUARY 27, 2020. THIS REPORT IS THE SOLE BASIS FOR TAX MATTERS, EASEMENTS, LIENS, MORTGAGES AND OTHER MATTERS OF PUBLIC RECORD SHOWN ON THIS SURVEY. THE SURVEYOR ASSUMES NO LIABILITY FOR THE OMISSION OF MATTERS NOT DISCLOSED IN SAID PRELIMINARY TITLE REPORT.

TOPOGRAPHIC DATA:

THE FIELD SURVEY WAS COMPLETED BY EGAN CIVIL, INC. ON SEPTEMBER 2, 2020 AND IS AUGMENTED WITH AERIAL PHOTOGRAMMETRY PROVIDED BY PALAND AERIAL SURVEYS UTILIZING CONTROL PROVIDED BY EGAN CIVIL, INC. THE DATE OF THE AERIAL FLIGHT IS 9/9/2020.

PROJECT DESCRIPTION

SUBDIVIDE EXISTING 16.23 ACRE PARCEL INTO (5) PARCELS WITH LETTERED LOT FOR ACCESS FOR FUTURE DEVELOPMENT

ZONING:

LOCATED IN IMPERIAL COUNTY ZONING MAP 109 - TERRACES OF HEBER
ZONING CLASSIFICATION: RS - RESIDENTIAL SUBURBAN RESIDENTIAL ZONE

GENERAL PLAN DESIGNATION:

LAND USE: URBAN AREA
DESIGNATED WITHIN HEBER URBAN AREA SPECIFIC PLAN

SPECIFIC PLAN:

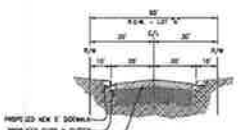
LOCATED IN HEBER TOWNSITE
HEBER URBAN AREA PLAN
DESIGNATED AS HIGH-QUALITY RESIDENTIAL DEVELOPMENT AREA

AREA TABULATION:

THE SUBJECT PROPERTY GROSS LAND AREA IS 16.23 ACRES, (706,702 SQ. FT.) MORE OR LESS.

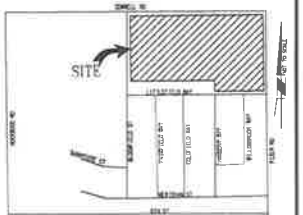
TABULATION OF PROPOSED LOT AREA'S:

IDENTITY	AREA (ACRES)	AREA (SQUARE FEET)
PARCEL 1	2.84	128,975
PARCEL 2	2.88	125,846
PARCEL 3	2.88	126,633
PARCEL 4	3.33	145,076
PARCEL 5	3.48	151,433
LOT "A"	0.36	24,328
TOTAL	16.23	706,702



TYPICAL SECTION
WILLOWBROOK PLACE

PREPARED BY:
EGAN CIVIL, INC.
BENJAMIN DANIEL EGAN, PE, PLS
42965 WINCHESTER, SUITE 4
TEMECULA, CA 92590
(760) 404-7860
BENJAMIN@EGANCIVIL.COM



DIGALERT — TOLL FREE 811 — A PUBLIC SERVICE OF UNDERGROUND SERVICE ALERT

SYMBOL LEGEND

ABBREVIATIONS:

AC	ASPHALT CONCRETE	HDPE	HIGH DENSITY POLYETHYLENE PIPE
APN	ASSESSOR PARCEL NUMBER	MH	MANHOLE
BOC	BACK OF CURB	MON	MONUMENT
CB	CATCH BASIN	N	NORTH
CL	CENTERLINE	NTS	NOT TO SCALE
CMP	CORRUGATED METAL PIPE	PP	POWER POLE
CO	CLEANOUT	PVC	POLYVINYL CHLORIDE PIPE
DI	DRAIN INLET	R	RADIUS
E	EAST	RCP	REINFORCED CONCRETE PIPE
EA	EACH	RW	RECYCLED WATER
EC	END OF CURVE	S	SOUTH
EL	ELEVATION	SD	STORM DRAIN
EP	EDGE OF PAVEMENT	SDMH	STORM DRAIN MANHOLE
ESMT	EASEMENT	SS	SANITARY SEWER
EX	EXISTING	SSMH	SANITARY SEWER MANHOLE
FC	FACE OF CURB	TC	TOP OF CURB
FF	FINISH FLOOR	TG	TOP OF GRATE
FG	FINISH GRADE	TS	TOP OF SLOPE
FH	FIRE HYDRANT	TW	TOP OF WALL
FL	FLOW LINE	W	WEST
FS	FINISH SURFACE	WM	WATER METER
GAS	GAS LINE	WV	WATER VALVE
GPS	GLOBAL POSITIONING SYSTEM	(E)	EXISTING
INV	INVERT ELEVATION	(P)	PROPOSED

EGAN CIVIL, INC. — PROFESSIONAL ENGINEERING & LAND SURVEYING — 42965 WINCHESTER ROAD, SUITE 4, TEMECULA, CA 92590 — (760) 404-7860

HOMES BY ADKINS CIVIC, LP
6334 PASEO DEL LAGO
CARLSBAD, CA 92011
CARE OF: DAVE DAVIS
760-814-4888 EXT. 175

UNINCORPORATED TOWNSITE COUNTY OF IMPERIAL, STATE OF CALIFORNIA
155 WILLOWBROOK WAY #1
HEBER, CA 92249

TENTATIVE TRACT MAP 00992
PROPOSED WET UTILITY LAYOUT

VACANT LAND
CHELSEA DEVELOPMENT

SHEET 1 OF 1 SHEETS
TM NO. 00992

EX-SHT PRINTED 09/02/2021

Appendix B

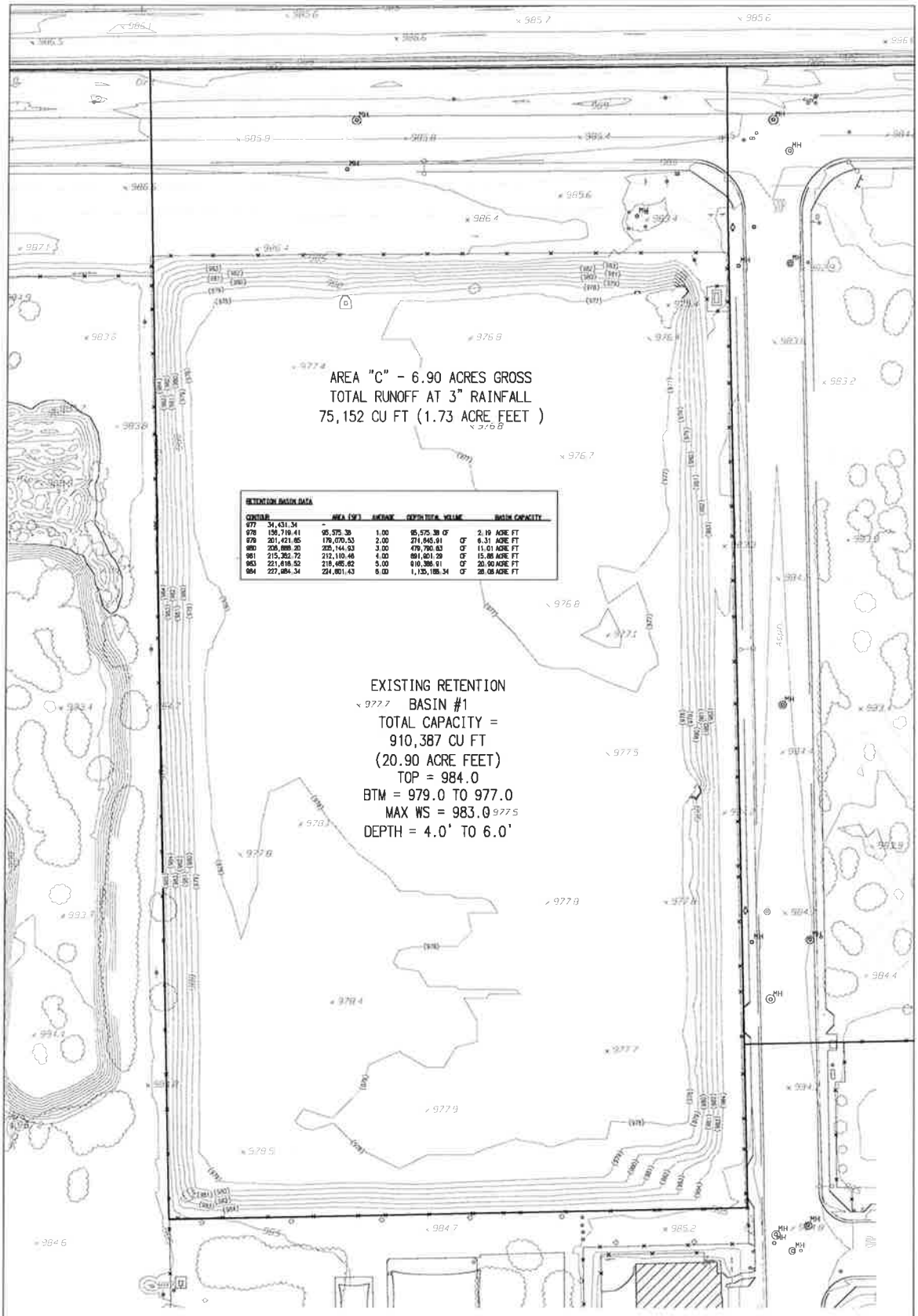
Calculations

TRACT 00992 - MIRALUZ
CORRAL AND PITZER
HEBER CALIFORNIA
EXISTING WEST RETENTION BASIN VOLUME ANALYSIS

CONTOUR	AREA (SF)	AVERAGE	DEPTH	TOTAL VOLUME		BASIN CAPACITY	
977	34,431.34		-				
978	156,719.41	95,575.38	1.00	95,575.38	CF	2.19	ACRE FT
979	201,421.65	179,070.53	2.00	274,645.91	CF	6.31	ACRE FT
980	208,868.20	205,144.93	3.00	479,790.83	CF	11.01	ACRE FT
981	215,352.72	212,110.46	4.00	691,901.29	CF	15.88	ACRE FT
983	221,618.52	218,485.62	5.00	910,386.91	CF	20.90	ACRE FT
984	227,984.34	224,801.43	6.00	1,135,188.34	CF	26.06	ACRE FT

TRACT 00992 - MIRALUZ
EXISTING WEST RETENTION BASIN DETAIL

UPDATED MARCH 24, 2021



RETENTION BASIN DATA

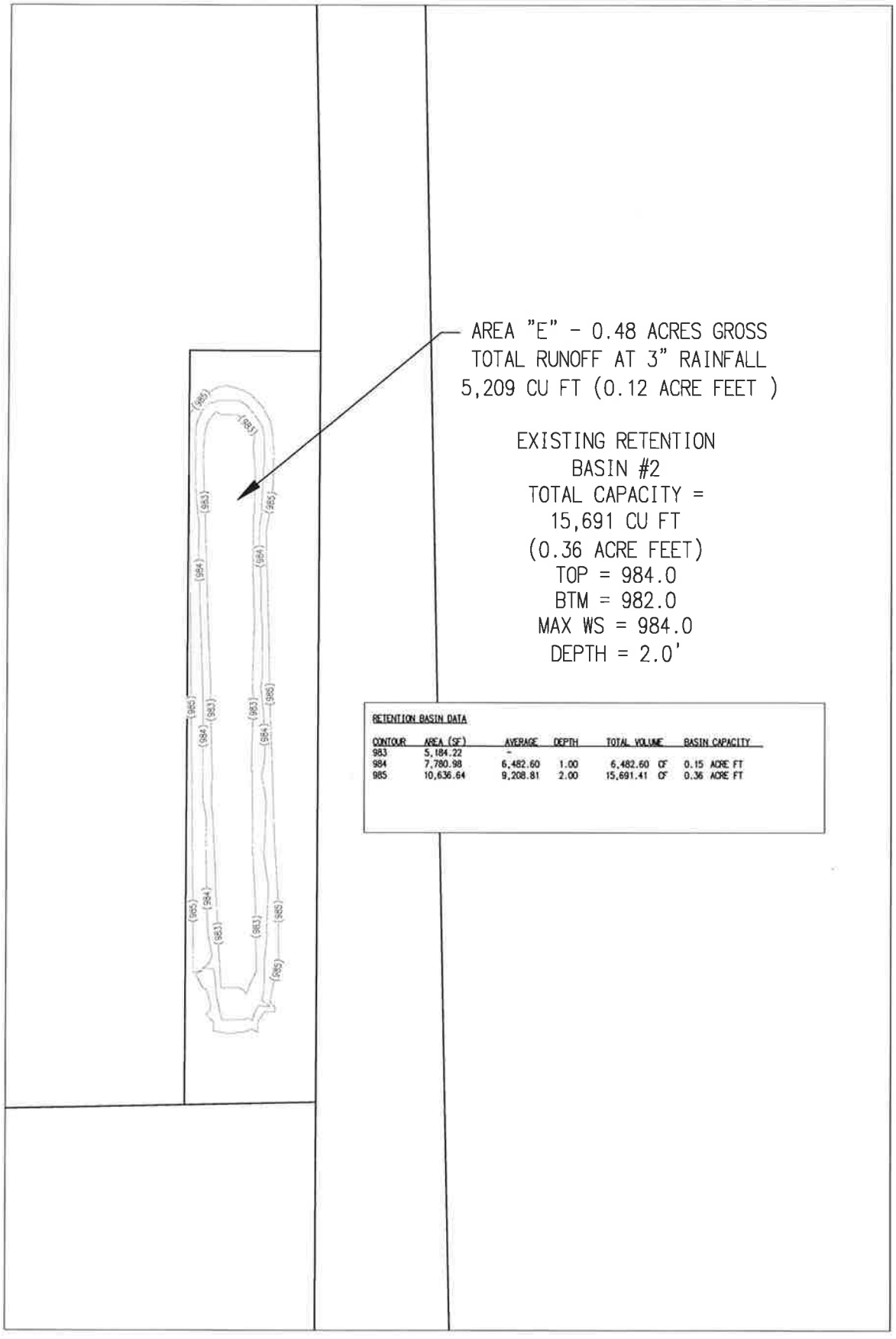
CONTOUR	AREA (SF)	AVERAGE	DEPTH	TOTAL VOLUME		BASIN CAPACITY
977	34,431.34	-				
978	136,719.41	85,575.38	1.00	85,575.38	CF	2.19 ACRE FT
979	201,421.65	169,070.53	2.00	274,645.91	CF	6.31 ACRE FT
980	206,888.20	205,144.93	3.00	479,790.83	CF	11.01 ACRE FT
981	215,352.72	212,110.46	4.00	691,901.29	CF	15.88 ACRE FT
983	221,818.52	218,485.62	5.00	910,386.91	CF	20.90 ACRE FT
984	227,854.34	224,801.43	6.00	1,135,188.34	CF	26.06 ACRE FT

TRACT 00992 - MIRALUZ
CORRAL AND PITZER
HEBER CALIFORNIA
EXISTING EAST RETENTION BASIN VOLUME ANALYSIS

CONTOUR	AREA (SF)	AVERAGE	DEPTH	TOTAL VOLUME	BASIN CAPACITY
983	5,184.22		-		
984	7,780.98	6,482.60	1.00	6,482.60 CF	0.15 ACRE FT
985	10,636.64	9,208.81	2.00	15,691.41 CF	0.36 ACRE FT

TRACT 00992 - MIRALUZ
EXISTING WEST RETENTION BASIN DETAIL

UPDATED MARCH 24, 2021



Appendix C

Original Heber Meadows Tract 00956

Preliminary Hydrology Study

PRELIMINARY HYDROLOGY REPORT
For
HEBER MEADOWS SUBDIVISION
SWC CORRELL ROAD AND PITZER ROAD
IMPERIAL COUNTY, CA

Prepared by:
Hale Engineering
7840 Convoy Court
San Diego, CA 92111
(858) 715-1420

Date:
November 21, 2003

TABLE OF CONTENTS

Section I

INTRODUCTION:

This preliminary study has been prepared to supplement the Tentative Map and Preliminary Grading plan submittal for the Heber Meadows Subdivision project. The proposed project is situated over 86.17 acres (APN 054-170-52 and 054-170-38) bounded to the north by Correll Drive and to the east by Pitzer Road. The project will be comprised of 10 acres at the westerly portion of the site, which will remain undeveloped, 5.8 acres dedicated for street widening on Correll Road and Pitzer Road, 16.3 acres at the northeasterly portion of the site, which will remain undeveloped, 9.5 acres reserved for the retention basin and open space park area, and 219 single family lots (each lot at 6,000 sq. ft. minimum) and local streets over the remaining 44.6 acres.

EXISTING CONDITION:

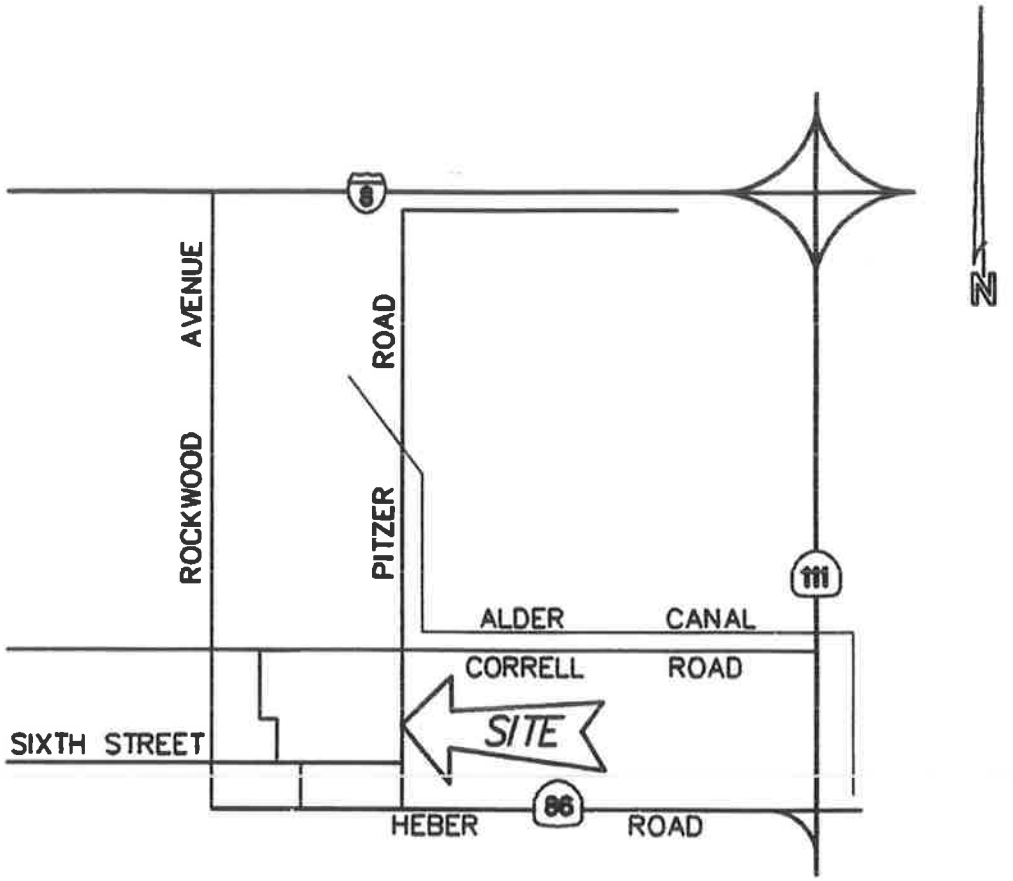
The site is currently vacant land used for agricultural purposes. The site sheet drains from the southerly boundary across the site at approximately 0.2% to the northerly boundary, where it is intercepted by an Imperial Irrigation District (IID)-maintained drainage ditch which parallels, and is located on the south side of Correll Drive. This major drainage ditch transports flows from a large drainage basin east of Rockwood Avenue. A smaller drainage ditch, which flows from south to north, bounds the property to the east.

DEVELOPED CONDITION:

The project proposes a combination of surface street flow coupled with an underground storm drain system. Proposed drainage from the local streets and single family lots, the 16 acre parcel (anticipated development runoff), and the open space park area flow through the system westerly toward a retention basin. The westerly 10 acre undeveloped parcel and the areas dedicated for street widening and easements along Correll Road and Pitzer Road are also considered tributary to the retention basin.

The retention basin volume shall hold the product of 3 inches (of rainfall) times the acreage of the entire site (see Retention Basin Calculations).

Section II



LOCATION MAP

NOT TO SCALE

HALE ENGINEERING

CIVIL ENGINEERING SURVEYING LAND PLANNING

7949 CONVOY COURT
SAN DIEGO, CA 92111

(858) 715-1430
(858) 715-1434 FAX

JOB NO. 0349 11/21/03

Section III

HYDROLOGIC CRITERIA (DESIGN CHARTS):

The rational formula was used for the hydrology computations depicted in this report. 100-year storm intensities are assumed for all calculations.

RATIONAL EQUATION –

Q = CIA where:

Q = Peak discharge – cfs

C = Coefficient of runoff

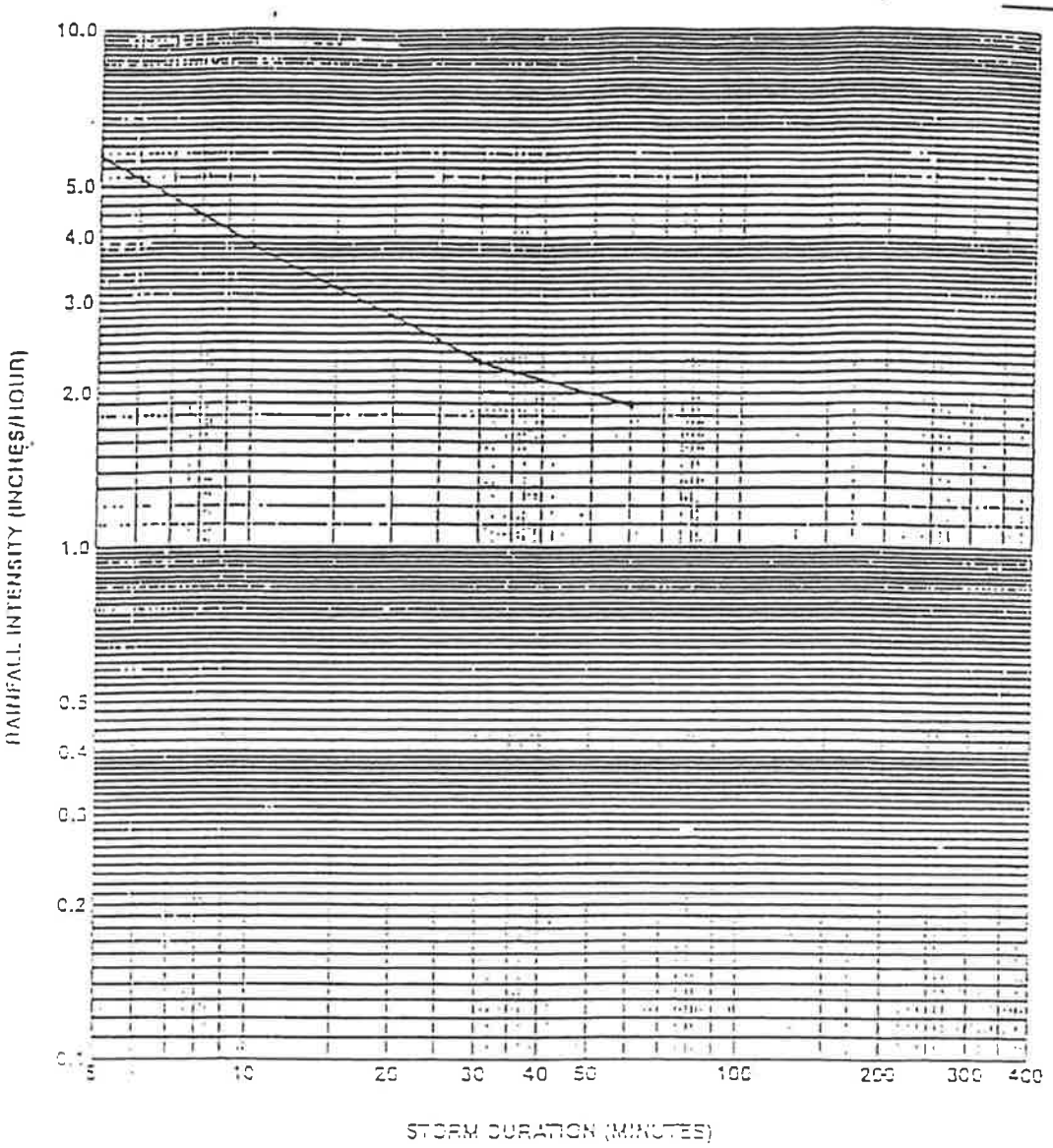
I = Rainfall intensity (inches/hour)

A = Area – acres

DETERMINATION OF INTENSITY –

The intensity duration curve is plotted on the Calculation Sheet Figure 4A of IID's hydrology manual. The curve is the result of first utilizing Figure 4B to determine the 100-year, 1-hour precipitation, which for this particular case is 1.8 inches. Then, using the 100-year, 1-hour precipitation, in conjunction with the corresponding ratios from Table B.1 of Figure 4C, the 5-minute, 10-minute, 15-minute and 30-minute quantities where determined.

Figure 4A: Intensity Duration Curves



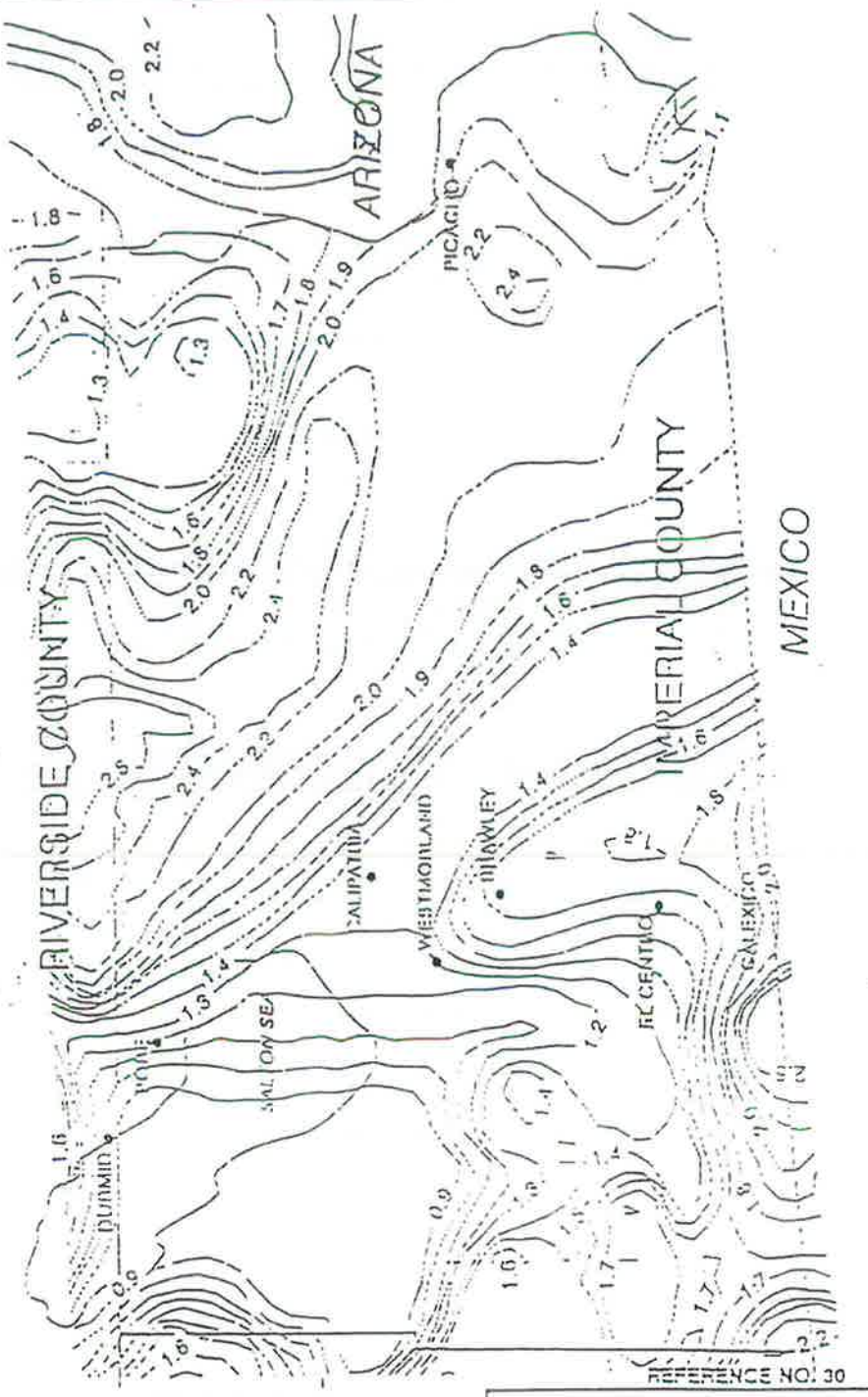
DESIGN STORM FREQUENCY = 100 YEARS

PROJECT LOCATION: 100 YEAR 1 HOUR CHART B-1 IID MANUAL

IMPERIAL IRRIGATION DISTRICT
HYDROLOGY MANUAL

INTENSITY-DURATION CURVES
CALCULATION SHEET

Figure 4B: 100-year, 1 Hour Precipitation



IMPERIAL IRRIGATION DISTRICT
HYDROLOGY MANUAL

100-YEAR, 1-HOUR PRECIPITATION

FIGURE B-3

Figure 4C: Development of Rainfall of various frequencies

TABLE B.1

RATIOS OF 5-MINUTE TO 30-MINUTE RAINFALL TO 60 MINUTE RAINFALL

	5-min	10-min	15-min	30-min
Ratio: n-min/60-min	0.33	0.49	0.60	0.82

Rainfall of frequencies other than those defined by the maps are determined in ratios of the 2-year rainfall. Table B.2 provides the NWS ratios for the Imperial County region.

TABLE B.2

DEVELOPMENT OF RAINFALL OF VARIOUS FREQUENCIES

	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr
Ratio: t-yr/2-yr	1.00	1.39	1.71	2.15	2.49	2.86	3.26

B.3. RANDOM NATURE OF POINT-PRECIPITATION DATA

When rain gauge records are examined to identify relationships with respect to time, a wide range of variations are found. These random variations are so great that they essentially obscure any long-term pattern or periodicity which may exist. To utilize point precipitation data, therefore, a combination of probabilistic and deterministic methods are needed. The durations and magnitude of individual storm events are assumed probabilistic, while the internal assemblage of a storm may be essentially deterministic. Additionally, the origin of storm events (e.g., convective, cyclonic) adds to the difficulty of developing a comprehensive analysis.

Section IV

```
**********************************************************************************

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2001,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2002 Advanced Engineering Software (aes)
            Ver. 1.5A Release Date: 01/01/2002  License ID 1508

                          Analysis prepared by:

                            HALE ENGINEERING
                            7840 CONVOY COURT
                            SAN DIEGO, CA. 92111

 ************************** DESCRIPTION OF STUDY **************************
* HEBER 85 DEVELOPED CONDITION                                            *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: HEB85DEV.DAT
  TIME/DATE OF STUDY: 10:15 11/20/2003
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  5
   1)    5.000;  5.760
   2)   10.000;  3.880
   3)   15.000;  3.170
   4)   30.000;  2.310
   5)   60.000;  1.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-   CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ====  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**********************************************************************************
  FLOW PROCESS FROM NODE       2.00 TO NODE       4.00 IS CODE =  21
--------------------------------------------------------------------------
```

```
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  665.00
 UPSTREAM ELEVATION =  990.70
 DOWNSTREAM ELEVATION =  986.20
 ELEVATION DIFFERENCE =  4.50
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  28.021
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.423
 SUBAREA RUNOFF(CFS) =  2.57
 TOTAL AREA(ACRES) =  1.86  TOTAL RUNOFF(CFS) =  2.57

********************************************************************************
 FLOW PROCESS FROM NODE  4.00 TO NODE  10.00 IS CODE =  31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  981.00  DOWNSTREAM(FEET) =  980.90
 FLOW LENGTH(FEET) =  34.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  9.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  2.77
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  2.57
 PIPE TRAVEL TIME(MIN.) =  0.20  Tc(MIN.) =  28.23
 LONGEST FLOWPATH FROM NODE  2.00 TO NODE  10.00 =  699.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE  10.00 TO NODE  20.00 IS CODE =  31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  980.90  DOWNSTREAM(FEET) =  978.30
 FLOW LENGTH(FEET) =  622.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  8.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  3.16
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  2.57
 PIPE TRAVEL TIME(MIN.) =  3.28  Tc(MIN.) =  31.51
 LONGEST FLOWPATH FROM NODE  2.00 TO NODE  20.00 =  1321.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE  20.00 TO NODE  20.00 IS CODE =  1
--------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  31.51
 RAINFALL INTENSITY(INCH/HR) =  2.29
```

```
 TOTAL STREAM AREA(ACRES) =    1.86
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.57

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     24.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   720.00
 UPSTREAM ELEVATION =    989.10
 DOWNSTREAM ELEVATION =    984.40
 ELEVATION DIFFERENCE =      4.70
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   29.509
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.338
 SUBAREA RUNOFF(CFS) =      5.48
 TOTAL AREA(ACRES) =      4.11   TOTAL RUNOFF(CFS) =      5.48

****************************************************************************
 FLOW PROCESS FROM NODE     24.00 TO NODE     20.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   978.80  DOWNSTREAM(FEET) =   978.30
 FLOW LENGTH(FEET) =    38.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.87
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      5.48
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =  29.62
 LONGEST FLOWPATH FROM NODE     22.00 TO NODE     20.00 =   758.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  29.62
 RAINFALL INTENSITY(INCH/HR) =   2.33
 TOTAL STREAM AREA(ACRES) =    4.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.48

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
    1          2.57     31.51         2.289          1.86
    2          5.48     29.62         2.332          4.11
```

```
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF      Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)
     1         8.00     29.62       2.332
     2         7.95     31.51       2.289

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       8.00   Tc(MIN.) =   29.62
 TOTAL AREA(ACRES) =      5.97
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     20.00 =  1321.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   978.30  DOWNSTREAM(FEET) =   976.90
 FLOW LENGTH(FEET) =   208.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.98
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      8.00
 PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =  30.31
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     30.00 =  1529.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  30.31
 RAINFALL INTENSITY(INCH/HR) =   2.31
 TOTAL STREAM AREA(ACRES) =    5.97
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.00

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     34.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   835.00
 UPSTREAM ELEVATION =    987.90
 DOWNSTREAM ELEVATION =    983.40
 ELEVATION DIFFERENCE =      4.50
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   33.875
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.257
```

```
 SUBAREA RUNOFF(CFS) =      4.55
 TOTAL AREA(ACRES) =      3.54   TOTAL RUNOFF(CFS) =      4.55

****************************************************************************
 FLOW PROCESS FROM NODE      34.00 TO NODE      30.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.90  DOWNSTREAM(FEET) =   976.90
 FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.53
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.55
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =  33.95
 LONGEST FLOWPATH FROM NODE      32.00 TO NODE      30.00 =   869.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      30.00 TO NODE      30.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  33.95
 RAINFALL INTENSITY(INCH/HR) =   2.26
 TOTAL STREAM AREA(ACRES) =    3.54
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.55

 ** CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         8.00     30.31        2.306         5.97
     2         4.55     33.95        2.256         3.54

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF      Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)
     1        12.65     30.31       2.306
     2        12.38     33.95       2.256

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     12.65   Tc(MIN.) =   30.31
 TOTAL AREA(ACRES) =      9.51
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE      30.00 =  1529.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      30.00 TO NODE      40.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.90  DOWNSTREAM(FEET) =   975.50
 FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.56
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     12.65
 PIPE TRAVEL TIME(MIN.) =   1.30    Tc(MIN.) =  31.61
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     40.00 =  1884.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  31.61
 RAINFALL INTENSITY(INCH/HR) =   2.29
 TOTAL STREAM AREA(ACRES) =    9.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.65

****************************************************************************
 FLOW PROCESS FROM NODE     42.00 TO NODE     44.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   757.00
 UPSTREAM ELEVATION =    986.00
 DOWNSTREAM ELEVATION =    982.50
 ELEVATION DIFFERENCE =      3.50
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   33.944
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.256
 SUBAREA RUNOFF(CFS) =      2.31
 TOTAL AREA(ACRES) =      1.80   TOTAL RUNOFF(CFS) =      2.31

****************************************************************************
 FLOW PROCESS FROM NODE     44.00 TO NODE     40.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.00  DOWNSTREAM(FEET) =   975.50
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.25
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.31
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  33.95
```

```
 LONGEST FLOWPATH FROM NODE     42.00 TO NODE     40.00 =   763.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  33.95
 RAINFALL INTENSITY(INCH/HR) =   2.26
 TOTAL STREAM AREA(ACRES) =    1.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.31

****************************************************************************
 FLOW PROCESS FROM NODE     46.00 TO NODE     48.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   865.00
 UPSTREAM ELEVATION =    986.60
 DOWNSTREAM ELEVATION =    982.50
 ELEVATION DIFFERENCE =      4.10
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   35.985
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.228
 SUBAREA RUNOFF(CFS) =      2.30
 TOTAL AREA(ACRES) =      1.81   TOTAL RUNOFF(CFS) =      2.30

****************************************************************************
 FLOW PROCESS FROM NODE     48.00 TO NODE     40.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.00  DOWNSTREAM(FEET) =   975.50
 FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.09
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.30
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =  36.07
 LONGEST FLOWPATH FROM NODE     46.00 TO NODE     40.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =  36.07
 RAINFALL INTENSITY(INCH/HR) =   2.23
 TOTAL STREAM AREA(ACRES) =    1.81
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.30

 ** CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        12.65     31.61       2.288         9.51
     2         2.31     33.95       2.256         1.80
     3         2.30     36.07       2.227         1.81

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF      Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)
     1        17.36     31.61       2.288
     2        17.06     33.95       2.256
     3        16.90     36.07       2.227

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     17.36   Tc(MIN.) =   31.61
 TOTAL AREA(ACRES) =     13.12
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     40.00 =  1884.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   975.50  DOWNSTREAM(FEET) =   973.50
 FLOW LENGTH(FEET) =   356.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     17.36
 PIPE TRAVEL TIME(MIN.) =   1.07    Tc(MIN.) =  32.68
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     50.00 =  2240.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
```

```
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   665.00
 UPSTREAM ELEVATION =    989.30
 DOWNSTREAM ELEVATION =    985.20
 ELEVATION DIFFERENCE =      4.10
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   28.905
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.373
 SUBAREA RUNOFF(CFS) =      2.88
 TOTAL AREA(ACRES) =      2.13   TOTAL RUNOFF(CFS) =      2.88

****************************************************************************
 FLOW PROCESS FROM NODE    102.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   979.70  DOWNSTREAM(FEET) =   979.20
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.60
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.88
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  28.91
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =   671.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  28.91
 RAINFALL INTENSITY(INCH/HR) =   2.37
 TOTAL STREAM AREA(ACRES) =    2.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.88

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    108.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   638.00
 UPSTREAM ELEVATION =    989.30
 DOWNSTREAM ELEVATION =    984.90
 ELEVATION DIFFERENCE =      4.40
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   27.274
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.466
 SUBAREA RUNOFF(CFS) =      2.71
```

```
 TOTAL AREA(ACRES) =      1.93   TOTAL RUNOFF(CFS) =      2.71

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   979.70  DOWNSTREAM(FEET) =   979.20
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.79
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.71
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  27.41
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    104.00 =   678.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  27.41
 RAINFALL INTENSITY(INCH/HR) =   2.46
 TOTAL STREAM AREA(ACRES) =    1.93
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.71

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1         2.88     28.91         2.372          2.13
     2         2.71     27.41         2.458          1.93

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         5.49     27.41         2.458
     2         5.50     28.91         2.372

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      5.50   Tc(MIN.) =   28.91
 TOTAL AREA(ACRES) =      4.06
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    104.00 =   678.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   979.20  DOWNSTREAM(FEET) =   977.00
 FLOW LENGTH(FEET) =   196.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.53
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      5.50
 PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  29.51
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    110.00 =   874.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  29.51
 RAINFALL INTENSITY(INCH/HR) =   2.34
 TOTAL STREAM AREA(ACRES) =    4.06
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.50

****************************************************************************
 FLOW PROCESS FROM NODE    112.00 TO NODE    114.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   340.00
 UPSTREAM ELEVATION =    987.90
 DOWNSTREAM ELEVATION =    983.90
 ELEVATION DIFFERENCE =      4.00
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   16.663
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.075
 SUBAREA RUNOFF(CFS) =      1.33
 TOTAL AREA(ACRES) =      0.76   TOTAL RUNOFF(CFS) =      1.33

****************************************************************************
 FLOW PROCESS FROM NODE    114.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.50  DOWNSTREAM(FEET) =   977.00
 FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.00
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      1.33
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =  16.73
 LONGEST FLOWPATH FROM NODE    112.00 TO NODE    110.00 =   360.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  16.73
 RAINFALL INTENSITY(INCH/HR) =   3.07
 TOTAL STREAM AREA(ACRES) =    0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.33

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
    1          5.50     29.51        2.338          4.06
    2          1.33     16.73        3.071          0.76

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
    1          5.52     16.73        3.071
    2          6.51     29.51        2.338

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      6.51   Tc(MIN.) =   29.51
 TOTAL AREA(ACRES) =      4.82
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    110.00 =   874.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.00  DOWNSTREAM(FEET) =   976.33
 FLOW LENGTH(FEET) =   290.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.17
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      6.51
 PIPE TRAVEL TIME(MIN.) =   1.52    Tc(MIN.) =  31.03
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    130.00 =  1164.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  697.00
 UPSTREAM ELEVATION =  990.70
 DOWNSTREAM ELEVATION =  985.10
 ELEVATION DIFFERENCE =  5.60
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  27.092
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.477
 SUBAREA RUNOFF(CFS) =  3.56
 TOTAL AREA(ACRES) =  2.52  TOTAL RUNOFF(CFS) =  3.56

****************************************************************************
 FLOW PROCESS FROM NODE  133.00 TO NODE  134.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  979.64  DOWNSTREAM(FEET) =  979.44
 FLOW LENGTH(FEET) =  6.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  5.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  7.35
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  3.56
 PIPE TRAVEL TIME(MIN.) =  0.01  Tc(MIN.) =  27.11
 LONGEST FLOWPATH FROM NODE  132.00 TO NODE  134.00 =  703.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  134.00 TO NODE  135.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  979.44  DOWNSTREAM(FEET) =  978.76
 FLOW LENGTH(FEET) =  110.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  9.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  3.96
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  3.56
 PIPE TRAVEL TIME(MIN.) =  0.46  Tc(MIN.) =  27.57
 LONGEST FLOWPATH FROM NODE  132.00 TO NODE  135.00 =  813.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  135.00 TO NODE  135.00 IS CODE =  1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  27.57
 RAINFALL INTENSITY(INCH/HR) =  2.45
 TOTAL STREAM AREA(ACRES) =  2.52
 PEAK FLOW RATE(CFS) AT CONFLUENCE =  3.56
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    136.00 TO NODE    138.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   615.00
 UPSTREAM ELEVATION =    989.20
 DOWNSTREAM ELEVATION =    984.80
 ELEVATION DIFFERENCE =      4.40
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   26.452
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.513
 SUBAREA RUNOFF(CFS) =      2.39
 TOTAL AREA(ACRES) =      1.67   TOTAL RUNOFF(CFS) =      2.39

****************************************************************************
 FLOW PROCESS FROM NODE    138.00 TO NODE    135.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   979.26  DOWNSTREAM(FEET) =   978.76
 FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.90
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.39
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  26.57
 LONGEST FLOWPATH FROM NODE    136.00 TO NODE    135.00 =   649.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  26.57
 RAINFALL INTENSITY(INCH/HR) =   2.51
 TOTAL STREAM AREA(ACRES) =    1.67
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.39

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
    1         3.56     27.57         2.449          2.52
    2         2.39     26.57         2.507          1.67

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc       INTENSITY
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
     1        5.87     26.57       2.507
     2        5.90     27.57       2.449

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      5.90   Tc(MIN.) =   27.57
 TOTAL AREA(ACRES) =      4.19
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    135.00 =   813.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    120.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   978.76  DOWNSTREAM(FEET) =   976.68
 FLOW LENGTH(FEET) =   317.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.54
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      5.90
 PIPE TRAVEL TIME(MIN.) =   1.16    Tc(MIN.) =  28.73
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    120.00 =  1130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  28.73
 RAINFALL INTENSITY(INCH/HR) =   2.38
 TOTAL STREAM AREA(ACRES) =    4.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.90

****************************************************************************
 FLOW PROCESS FROM NODE    122.00 TO NODE    124.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   503.00
 UPSTREAM ELEVATION =    988.00
 DOWNSTREAM ELEVATION =    983.60
 ELEVATION DIFFERENCE =      4.40
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   22.372
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.747
 SUBAREA RUNOFF(CFS) =      3.01
 TOTAL AREA(ACRES) =      1.92   TOTAL RUNOFF(CFS) =      3.01
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    124.00 TO NODE    120.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.18  DOWNSTREAM(FEET) =   976.68
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.70
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      3.01
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  22.38
 LONGEST FLOWPATH FROM NODE    122.00 TO NODE    120.00 =   509.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  22.38
 RAINFALL INTENSITY(INCH/HR) =   2.75
 TOTAL STREAM AREA(ACRES) =    1.92
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.01

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1         5.90     28.73         2.383         4.19
     2         3.01     22.38         2.747         1.92

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         8.12     22.38        2.747
     2         8.50     28.73        2.383

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      8.50   Tc(MIN.) =   28.73
 TOTAL AREA(ACRES) =      6.11
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    120.00 =  1130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.68  DOWNSTREAM(FEET) =   976.33
```

```
 FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.42
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      8.50
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =  29.00
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    130.00 =  1201.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1          8.50     29.00        2.367         6.11
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    130.00 =  1201.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1          6.51     31.03        2.296         4.82
 LONGEST FLOWPATH FROM NODE    106.00 TO NODE    130.00 =  1164.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)      (MIN.)    (INCH/HOUR)
    1        14.82       29.00        2.367
    2        14.76       31.03        2.296

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     14.82   Tc(MIN.) =   29.00
 TOTAL AREA(ACRES) =     10.93

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.33  DOWNSTREAM(FEET) =   975.58
 FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.08
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     14.82
 PIPE TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =  30.14
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    150.00 =  1481.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  30.14
 RAINFALL INTENSITY(INCH/HR) =   2.31
 TOTAL STREAM AREA(ACRES) =   10.93
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.82

****************************************************************************
 FLOW PROCESS FROM NODE     146.00 TO NODE     148.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   727.00
 UPSTREAM ELEVATION =    987.40
 DOWNSTREAM ELEVATION =    982.94
 ELEVATION DIFFERENCE =      4.46
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   30.272
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.306
 SUBAREA RUNOFF(CFS) =      2.68
 TOTAL AREA(ACRES) =      2.04   TOTAL RUNOFF(CFS) =      2.68

****************************************************************************
 FLOW PROCESS FROM NODE     148.00 TO NODE     150.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.08  DOWNSTREAM(FEET) =   975.58
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.84
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.68
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  30.28
 LONGEST FLOWPATH FROM NODE     146.00 TO NODE     150.00 =   733.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     150.00 TO NODE     150.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  30.28
 RAINFALL INTENSITY(INCH/HR) =   2.31
 TOTAL STREAM AREA(ACRES) =    2.04
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.68

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
```

```
    1       14.82     30.14         2.308          10.93
    2        2.68     30.28         2.306           2.04

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM      RUNOFF       Tc       INTENSITY
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
      1        17.50     30.14        2.308
      2        17.49     30.28        2.306

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     17.50   Tc(MIN.) =   30.14
  TOTAL AREA(ACRES) =     12.97
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    150.00 =  1481.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .5700
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH =   797.00
  UPSTREAM ELEVATION =    987.80
  DOWNSTREAM ELEVATION =    983.60
  ELEVATION DIFFERENCE =      4.20
  URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   33.343
  *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
     NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.264
  SUBAREA RUNOFF(CFS) =      2.59
  TOTAL AREA(ACRES) =      2.01   TOTAL RUNOFF(CFS) =      2.59

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   978.10  DOWNSTREAM(FEET) =   977.60
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
```

```
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.30
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.59
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  33.35
 LONGEST FLOWPATH FROM NODE    152.00 TO NODE    154.00 =   803.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  33.35
 RAINFALL INTENSITY(INCH/HR) =   2.26
 TOTAL STREAM AREA(ACRES) =    2.01
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.59

****************************************************************************
 FLOW PROCESS FROM NODE    156.00 TO NODE    158.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   638.00
 UPSTREAM ELEVATION =    988.20
 DOWNSTREAM ELEVATION =    983.60
 ELEVATION DIFFERENCE =      4.60
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   26.872
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.489
 SUBAREA RUNOFF(CFS) =      2.36
 TOTAL AREA(ACRES) =      1.66   TOTAL RUNOFF(CFS) =      2.36

****************************************************************************
 FLOW PROCESS FROM NODE    158.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   978.10  DOWNSTREAM(FEET) =   977.60
 FLOW LENGTH(FEET) =    39.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.64
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.36
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =  27.01
 LONGEST FLOWPATH FROM NODE    156.00 TO NODE    154.00 =   677.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =  27.01
RAINFALL INTENSITY(INCH/HR) =   2.48
TOTAL STREAM AREA(ACRES) =    1.66
PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.36

** CONFLUENCE DATA **
STREAM      RUNOFF      Tc       INTENSITY      AREA
NUMBER       (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1         2.59    33.35        2.264         2.01
    2         2.36    27.01        2.481         1.66

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR  2 STREAMS.

** PEAK FLOW RATE TABLE **
STREAM      RUNOFF      Tc       INTENSITY
NUMBER       (CFS)    (MIN.)   (INCH/HOUR)
    1         4.72    27.01        2.481
    2         4.74    33.35        2.264

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      4.74   Tc(MIN.) =   33.35
TOTAL AREA(ACRES) =      3.67
LONGEST FLOWPATH FROM NODE    152.00 TO NODE    154.00 =   803.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    154.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   977.60  DOWNSTREAM(FEET) =   976.01
FLOW LENGTH(FEET) =   262.00   MANNING'S N =  0.015
DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   4.22
ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =      4.74
PIPE TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =  34.39
LONGEST FLOWPATH FROM NODE    152.00 TO NODE    140.00 =  1065.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =   1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
TIME OF CONCENTRATION(MIN.) =  34.39
RAINFALL INTENSITY(INCH/HR) =   2.25
TOTAL STREAM AREA(ACRES) =    3.67
PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.74
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    142.00 TO NODE    144.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  662.00
 UPSTREAM ELEVATION =  987.40
 DOWNSTREAM ELEVATION =  982.75
 ELEVATION DIFFERENCE =  4.65
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  27.613
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.447
 SUBAREA RUNOFF(CFS) =  3.11
 TOTAL AREA(ACRES) =  2.23  TOTAL RUNOFF(CFS) =  3.11

****************************************************************************
 FLOW PROCESS FROM NODE    144.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  976.51  DOWNSTREAM(FEET) =  976.01
 FLOW LENGTH(FEET) =  6.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  4.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  9.81
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  3.11
 PIPE TRAVEL TIME(MIN.) =  0.01  Tc(MIN.) =  27.62
 LONGEST FLOWPATH FROM NODE  142.00 TO NODE  140.00 =  668.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =  1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  27.62
 RAINFALL INTENSITY(INCH/HR) =  2.45
 TOTAL STREAM AREA(ACRES) =  2.23
 PEAK FLOW RATE(CFS) AT CONFLUENCE =  3.11

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1         4.74    34.39       2.250         3.67
    2         3.11    27.62       2.446         2.23

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1         7.47    27.62       2.446
    2         7.60    34.39       2.250

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      7.60   Tc(MIN.) =   34.39
 TOTAL AREA(ACRES) =      5.90
 LONGEST FLOWPATH FROM NODE    152.00 TO NODE    140.00 =  1065.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    140.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.01  DOWNSTREAM(FEET) =   975.58
 FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.73
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.60
 PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =  34.64
 LONGEST FLOWPATH FROM NODE    152.00 TO NODE    150.00 =  1136.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1         7.60    34.64       2.247        5.90
 LONGEST FLOWPATH FROM NODE    152.00 TO NODE    150.00 =  1136.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        17.50    30.14       2.308       12.97
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    150.00 =  1481.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1       24.90      30.14       2.308
    2       24.64      34.64       2.247

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     24.90   Tc(MIN.) =   30.14
 TOTAL AREA(ACRES) =     18.87

****************************************************************************
 FLOW PROCESS FROM NODE    150.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    174.00 =   763.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    174.00 TO NODE    174.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  32.21
 RAINFALL INTENSITY(INCH/HR) =   2.28
 TOTAL STREAM AREA(ACRES) =    1.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.34

****************************************************************************
 FLOW PROCESS FROM NODE    176.00 TO NODE    178.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   638.00
 UPSTREAM ELEVATION =    987.10
 DOWNSTREAM ELEVATION =    982.80
 ELEVATION DIFFERENCE =      4.30
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   27.483
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.454
 SUBAREA RUNOFF(CFS) =      2.32
 TOTAL AREA(ACRES) =      1.66   TOTAL RUNOFF(CFS) =      2.32

****************************************************************************
 FLOW PROCESS FROM NODE    178.00 TO NODE    174.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   977.30  DOWNSTREAM(FEET) =   976.80
 FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.86
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.32
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  27.60
 LONGEST FLOWPATH FROM NODE    176.00 TO NODE    174.00 =   672.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    174.00 TO NODE    174.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =  27.60
 RAINFALL INTENSITY(INCH/HR) =   2.45
 TOTAL STREAM AREA(ACRES) =    1.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.32

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1         2.34     32.21         2.280          1.80
     2         2.32     27.60         2.448          1.66

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         4.50     27.60         2.448
     2         4.50     32.21         2.280

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      4.50   Tc(MIN.) =   32.21
 TOTAL AREA(ACRES) =      3.46
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    174.00 =   763.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    174.00 TO NODE    160.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.80  DOWNSTREAM(FEET) =   974.83
 FLOW LENGTH(FEET) =   354.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.03
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.50
 PIPE TRAVEL TIME(MIN.) =   1.47    Tc(MIN.) =  33.68
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    160.00 =  1117.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    160.00 TO NODE    160.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  33.68
 RAINFALL INTENSITY(INCH/HR) =   2.26
 TOTAL STREAM AREA(ACRES) =    3.46
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     4.50

****************************************************************************
 FLOW PROCESS FROM NODE    162.00 TO NODE    164.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  607.00
 UPSTREAM ELEVATION =  986.70
 DOWNSTREAM ELEVATION =  981.91
 ELEVATION DIFFERENCE =  4.79
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  25.434
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.572
 SUBAREA RUNOFF(CFS) =  2.98
 TOTAL AREA(ACRES) =  2.03  TOTAL RUNOFF(CFS) =  2.98

****************************************************************************
 FLOW PROCESS FROM NODE  164.00 TO NODE  160.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  975.33  DOWNSTREAM(FEET) =  974.83
 FLOW LENGTH(FEET) =  6.00  MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  4.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  9.69
 ESTIMATED PIPE DIAMETER(INCH) =  18.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  2.98
 PIPE TRAVEL TIME(MIN.) =  0.01  Tc(MIN.) =  25.44
 LONGEST FLOWPATH FROM NODE  162.00 TO NODE  160.00 =  613.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  160.00 TO NODE  160.00 IS CODE =  1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  25.44
 RAINFALL INTENSITY(INCH/HR) =  2.57
 TOTAL STREAM AREA(ACRES) =  2.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =  2.98

 ** CONFLUENCE DATA **
 STREAM    RUNOFF     Tc     INTENSITY     AREA
 NUMBER     (CFS)   (MIN.)  (INCH/HOUR)   (ACRE)
    1       4.50    33.68      2.260       3.46
    2       2.98    25.44      2.571       2.03

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF     Tc     INTENSITY
 NUMBER     (CFS)   (MIN.)  (INCH/HOUR)
    1       6.93    25.44      2.571
    2       7.12    33.68      2.260
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      7.12   Tc(MIN.) =   33.68
 TOTAL AREA(ACRES) =      5.49
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    160.00 =  1117.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    160.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   974.83  DOWNSTREAM(FEET) =   974.43
 FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.53
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.12
 PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =  33.94
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    170.00 =  1188.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    170.00 TO NODE    170.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1          7.12     33.94        2.256         5.49
 LONGEST FLOWPATH FROM NODE    172.00 TO NODE    170.00 =  1188.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1         24.90     30.92        2.297        18.87
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    170.00 =  1741.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
    1        31.89      30.92        2.297
    2        31.57      33.94        2.256

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     31.89   Tc(MIN.) =   30.92
 TOTAL AREA(ACRES) =     24.36

****************************************************************************
 FLOW PROCESS FROM NODE    170.00 TO NODE    180.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   974.43  DOWNSTREAM(FEET) =   973.66
 FLOW LENGTH(FEET) =   216.00   MANNING'S N =  0.015
```

```
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     31.89
 PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =  31.58
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    180.00 =  1957.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    180.00 TO NODE    180.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  31.58
 RAINFALL INTENSITY(INCH/HR) =   2.29
 TOTAL STREAM AREA(ACRES) =   24.36
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.89

****************************************************************************
 FLOW PROCESS FROM NODE    182.00 TO NODE    184.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   607.00
 UPSTREAM ELEVATION =    986.00
 DOWNSTREAM ELEVATION =    981.40
 ELEVATION DIFFERENCE =      4.60
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   25.780
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.552
 SUBAREA RUNOFF(CFS) =      2.95
 TOTAL AREA(ACRES) =      2.03   TOTAL RUNOFF(CFS) =      2.95

****************************************************************************
 FLOW PROCESS FROM NODE    184.00 TO NODE    180.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   975.66  DOWNSTREAM(FEET) =   973.66
 FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.53
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.95
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =  25.85
 LONGEST FLOWPATH FROM NODE    182.00 TO NODE    180.00 =   641.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    180.00 TO NODE    180.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  25.85
 RAINFALL INTENSITY(INCH/HR) =   2.55
 TOTAL STREAM AREA(ACRES) =    2.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.95

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
    1       31.89    31.58        2.288         24.36
    2        2.95    25.85        2.548          2.03

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
    1       31.59    25.85        2.548
    2       34.54    31.58        2.288

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     34.54   Tc(MIN.) =   31.58
 TOTAL AREA(ACRES) =     26.39
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE    180.00 =  1957.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    180.00 TO NODE     50.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   973.66  DOWNSTREAM(FEET) =   973.50
 FLOW LENGTH(FEET) =    43.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.71
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     34.54
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =  31.71
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE     50.00 =  2000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1       34.54    31.71        2.287        26.39
 LONGEST FLOWPATH FROM NODE    132.00 TO NODE     50.00 =  2000.00 FEET.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)    (MIN.)    (INCH/HOUR)    (ACRE)
    1         17.36    32.68        2.273        13.12
 LONGEST FLOWPATH FROM NODE       2.00 TO NODE      50.00 =  2240.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc       INTENSITY
 NUMBER      (CFS)      (MIN.)    (INCH/HOUR)
    1        51.81       31.71        2.287
    2        51.71       32.68        2.273

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     51.81   Tc(MIN.) =   31.71
 TOTAL AREA(ACRES) =     39.51

****************************************************************************
 FLOW PROCESS FROM NODE      50.00 TO NODE      60.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   973.50  DOWNSTREAM(FEET) =   972.67
 FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.49
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     51.81
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =  31.89
 LONGEST FLOWPATH FROM NODE       2.00 TO NODE      60.00 =  2335.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      60.00 TO NODE      60.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  31.89
 RAINFALL INTENSITY(INCH/HR) =   2.28
 TOTAL STREAM AREA(ACRES) =   39.51
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     51.81

****************************************************************************
 FLOW PROCESS FROM NODE      62.00 TO NODE      64.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   846.00
 UPSTREAM ELEVATION =    985.90
 DOWNSTREAM ELEVATION =    981.10
 ELEVATION DIFFERENCE =      4.80
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   33.517
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
```

```
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.262
 SUBAREA RUNOFF(CFS) =      2.60
 TOTAL AREA(ACRES) =      2.02   TOTAL RUNOFF(CFS) =      2.60

****************************************************************************
 FLOW PROCESS FROM NODE      64.00 TO NODE      60.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   975.17  DOWNSTREAM(FEET) =   972.67
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.44
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.60
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  33.52
 LONGEST FLOWPATH FROM NODE     62.00 TO NODE     60.00 =   852.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      60.00 TO NODE      60.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  33.52
 RAINFALL INTENSITY(INCH/HR) =   2.26
 TOTAL STREAM AREA(ACRES) =    2.02
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.60

****************************************************************************
 FLOW PROCESS FROM NODE      66.00 TO NODE      68.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .5700
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   689.00
 UPSTREAM ELEVATION =    985.30
 DOWNSTREAM ELEVATION =    981.10
 ELEVATION DIFFERENCE =      4.20
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   29.533
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.337
 SUBAREA RUNOFF(CFS) =      2.69
 TOTAL AREA(ACRES) =      2.02   TOTAL RUNOFF(CFS) =      2.69

****************************************************************************
 FLOW PROCESS FROM NODE      68.00 TO NODE      60.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   975.17  DOWNSTREAM(FEET) =   972.67
 FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.99
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      2.69
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =  29.60
 LONGEST FLOWPATH FROM NODE     66.00 TO NODE     60.00 =   723.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =  29.60
 RAINFALL INTENSITY(INCH/HR) =   2.33
 TOTAL STREAM AREA(ACRES) =    2.02
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.69

 ** CONFLUENCE DATA **
 STREAM      RUNOFF      Tc       INTENSITY      AREA
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        51.81     31.89        2.284        39.51
     2         2.60     33.52        2.262         2.02
     3         2.69     29.60        2.333         2.02

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF      Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)   (INCH/HOUR)
     1        55.93     29.60        2.333
     2        57.02     31.89        2.284
     3        56.51     33.52        2.262

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     57.02   Tc(MIN.) =   31.89
 TOTAL AREA(ACRES) =     43.55
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     60.00 =  2335.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   972.67  DOWNSTREAM(FEET) =   972.00
 FLOW LENGTH(FEET) =   157.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
 ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
```

```
 PIPE-FLOW(CFS) =     57.02
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =  32.28
 LONGEST FLOWPATH FROM NODE      2.00 TO NODE     70.00 =  2492.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =     43.55  TC(MIN.) =     32.28
 PEAK FLOW RATE(CFS)   =     57.02
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************

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                          Analysis prepared by:

                            HALE ENGINEERING
                           7840 CONVOY COURT
                          SAN DIEGO, CA. 92111


 ************************** DESCRIPTION OF STUDY **************************
* HEBER MULTI-FAMILY DEVELOPED CONDITION                                  *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: HEBMUDEV.DAT
  TIME/DATE OF STUDY: 10:40 11/20/2003
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  5
   1)   5.000;  5.760
   2)  10.000;  3.880
   3)  15.000;  3.170
   4)  30.000;  2.310
   5)  60.000;  1.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  ================  ======  =====  ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00  0.0313  0.167  0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    207.00 IS CODE =  21
-------------------------------------------------------------------------
```

```
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7900
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  1249.00
 UPSTREAM ELEVATION =  985.60
 DOWNSTREAM ELEVATION =  983.00
 ELEVATION DIFFERENCE =  2.60
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  33.273
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.265
 SUBAREA RUNOFF(CFS) =  26.93
 TOTAL AREA(ACRES) =  15.05  TOTAL RUNOFF(CFS) =  26.93

********************************************************************************
 FLOW PROCESS FROM NODE  207.00 TO NODE  209.00 IS CODE =  31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  973.00  DOWNSTREAM(FEET) =  972.00
 FLOW LENGTH(FEET) =  200.00  MANNING'S N =  0.015
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  5.97
 ESTIMATED PIPE DIAMETER(INCH) =  33.00  NUMBER OF PIPES =  1
 PIPE-FLOW(CFS) =  26.93
 PIPE TRAVEL TIME(MIN.) =  0.56  Tc(MIN.) =  33.83
 LONGEST FLOWPATH FROM NODE  205.00 TO NODE  209.00 =  1449.00 FEET.
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)  =  15.05  TC(MIN.) =  33.83
 PEAK FLOW RATE(CFS)  =  26.93
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************

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                          Analysis prepared by:

                            HALE ENGINEERING
                           7840 CONVOY COURT
                          SAN DIEGO, CA. 92111

 ************************** DESCRIPTION OF STUDY **************************
* PITZER ROAD                                                             *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: PITZER.DAT
  TIME/DATE OF STUDY: 15:55 11/19/2003
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  5
   1)   5.000;  5.760
   2)  10.000;  3.880
   3)  15.000;  3.170
   4)  30.000;  2.310
   5)  60.000;  1.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-   CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0   0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =   7
--------------------------------------------------------------------------
```

```
 >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
================================================================================
 USER-SPECIFIED VALUES ARE AS FOLLOWS:
 TC(MIN) =   5.00   RAIN INTENSITY(INCH/HOUR) =  5.76
 TOTAL AREA(ACRES) =     1.30   TOTAL RUNOFF(CFS) =      4.90

********************************************************************************
 FLOW PROCESS FROM NODE   310.00 TO NODE    320.00 IS CODE =  31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   982.21  DOWNSTREAM(FEET) =   981.21
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.30
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.90
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   5.01
 LONGEST FLOWPATH FROM NODE      0.00 TO NODE    320.00 =     6.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE    320.00 TO NODE    330.00 IS CODE =  31
--------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   981.21  DOWNSTREAM(FEET) =   978.72
 FLOW LENGTH(FEET) =   840.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.25
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      4.90
 PIPE TRAVEL TIME(MIN.) =   4.31    Tc(MIN.) =   9.32
 LONGEST FLOWPATH FROM NODE      0.00 TO NODE    330.00 =   846.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
--------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   9.32
 RAINFALL INTENSITY(INCH/HR) =   4.14
 TOTAL STREAM AREA(ACRES) =    1.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.90

********************************************************************************
 FLOW PROCESS FROM NODE    332.00 TO NODE    334.00 IS CODE =  21
--------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7500
 S.C.S. CURVE NUMBER (AMC II) =   0
```

```
 INITIAL SUBAREA FLOW-LENGTH =   935.00
 UPSTREAM ELEVATION =    990.70
 DOWNSTREAM ELEVATION =    985.72
 ELEVATION DIFFERENCE =      4.98
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   23.765
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.667
 SUBAREA RUNOFF(CFS) =      3.54
 TOTAL AREA(ACRES) =      1.77   TOTAL RUNOFF(CFS) =      3.54

****************************************************************************
 FLOW PROCESS FROM NODE    334.00 TO NODE    330.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   979.72  DOWNSTREAM(FEET) =   978.72
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.01
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      3.54
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  23.77
 LONGEST FLOWPATH FROM NODE    332.00 TO NODE    330.00 =   941.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  23.77
 RAINFALL INTENSITY(INCH/HR) =   2.67
 TOTAL STREAM AREA(ACRES) =    1.77
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.54

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1         4.90      9.32         4.137          1.30
     2         3.54     23.77         2.667          1.77

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1         7.18      9.32         4.137
     2         6.70     23.77         2.667

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      7.18   Tc(MIN.) =    9.32
```

```
 TOTAL AREA(ACRES) =      3.07
 LONGEST FLOWPATH FROM NODE    332.00 TO NODE    330.00 =   941.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    340.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   978.72  DOWNSTREAM(FEET) =   976.62
 FLOW LENGTH(FEET) =   809.00   MANNING'S N =  0.015
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.39
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.18
 PIPE TRAVEL TIME(MIN.) =   3.98    Tc(MIN.) =  13.29
 LONGEST FLOWPATH FROM NODE    332.00 TO NODE    340.00 =  1750.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    340.00 TO NODE    344.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   976.62  DOWNSTREAM(FEET) =   975.62
 FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.015
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.96
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      7.18
 PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =  13.30
 LONGEST FLOWPATH FROM NODE    332.00 TO NODE    344.00 =  1756.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    344.00 TO NODE    344.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =  13.30
 RAINFALL INTENSITY(INCH/HR) =   3.41
 TOTAL STREAM AREA(ACRES) =    3.07
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.18

****************************************************************************
 FLOW PROCESS FROM NODE    342.00 TO NODE    344.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7500
 S.C.S. CURVE NUMBER (AMC II) =   0
 INITIAL SUBAREA FLOW-LENGTH =   836.00
 UPSTREAM ELEVATION =    986.82
 DOWNSTREAM ELEVATION =    983.62
```

```
 ELEVATION DIFFERENCE =      3.20
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =   25.087
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.592
 SUBAREA RUNOFF(CFS) =      4.84
 TOTAL AREA(ACRES) =      2.49   TOTAL RUNOFF(CFS) =      4.84

****************************************************************************
 FLOW PROCESS FROM NODE    344.00 TO NODE    344.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =  25.09
 RAINFALL INTENSITY(INCH/HR) =   2.59
 TOTAL STREAM AREA(ACRES) =    2.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.84

 ** CONFLUENCE DATA **
 STREAM      RUNOFF       Tc       INTENSITY       AREA
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)     (ACRE)
     1         7.18     13.30         3.411          3.07
     2         4.84     25.09         2.592          2.49

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM      RUNOFF       Tc       INTENSITY
 NUMBER       (CFS)     (MIN.)    (INCH/HOUR)
     1        13.55     13.30       3.411
     2        10.30     25.09       2.592

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     13.55   Tc(MIN.) =   13.30
 TOTAL AREA(ACRES) =      5.56
 LONGEST FLOWPATH FROM NODE    332.00 TO NODE    344.00 =  1756.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =      5.56  TC(MIN.) =     13.30
 PEAK FLOW RATE(CFS)    =     13.55
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************

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                          Analysis prepared by:

                            HALE ENGINEERING
                            7840 CONVOY COURT
                           SAN DIEGO, CA. 92111

 ************************** DESCRIPTION OF STUDY **************************
* CORRELL ROAD 1                                                          *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: CORRELL1.DAT
  TIME/DATE OF STUDY: 10:22 11/20/2003
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  5
   1)   5.000;  5.760
   2)  10.000;  3.880
   3)  15.000;  3.170
   4)  30.000;  2.310
   5)  60.000;  1.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  =====  ======  =====  =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00  0.0313  0.167  0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE     400.00 TO NODE     410.00 IS CODE =  21
--------------------------------------------------------------------------
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .7500
S.C.S. CURVE NUMBER (AMC II) =  0
INITIAL SUBAREA FLOW-LENGTH =  738.00
UPSTREAM ELEVATION =  984.42
DOWNSTREAM ELEVATION =  983.02
ELEVATION DIFFERENCE =  1.40
URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  29.785
*CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
 DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
*CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
   NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.322
SUBAREA RUNOFF(CFS) =  2.51
TOTAL AREA(ACRES) =  1.44  TOTAL RUNOFF(CFS) =  2.51
================================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)  =  1.44  TC(MIN.) =  29.78
PEAK FLOW RATE(CFS)  =  2.51
================================================================================
================================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************

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                          Analysis prepared by:

                            HALE ENGINEERING
                            7840 CONVOY COURT
                           SAN DIEGO, CA. 92111

 ************************** DESCRIPTION OF STUDY **************************
* CORRELL ROAD 2                                                          *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: CORRELL2.DAT
  TIME/DATE OF STUDY: 10:29 11/20/2003
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  5
   1)    5.000;  5.760
   2)   10.000;  3.880
   3)   15.000;  3.170
   4)   30.000;  2.310
   5)   60.000;  1.900
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ==================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE     500.00 TO NODE     510.00 IS CODE =  21
--------------------------------------------------------------------------
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .7500
 S.C.S. CURVE NUMBER (AMC II) =  0
 INITIAL SUBAREA FLOW-LENGTH =  608.00
 UPSTREAM ELEVATION =  983.52
 DOWNSTREAM ELEVATION =  982.42
 ELEVATION DIFFERENCE =  1.10
 URBAN SUBAREA OVERLAND TIME OF FLOW(MINUTES) =  27.464
 *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
  DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
 *CAUTION: SUBAREA FLOWLENGTH EXCEEDS COUNTY
    NOMOGRAPH DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.455
 SUBAREA RUNOFF(CFS) =  3.54
 TOTAL AREA(ACRES) =  1.92   TOTAL RUNOFF(CFS) =  3.54
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)  =  1.92  TC(MIN.) =  27.46
 PEAK FLOW RATE(CFS)  =  3.54
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

Section V

RETENTION BASIN CALCULATIONS:

Per IID's requirements, the site is required to retain a volume equivalent to 3" of runoff over the entire site.

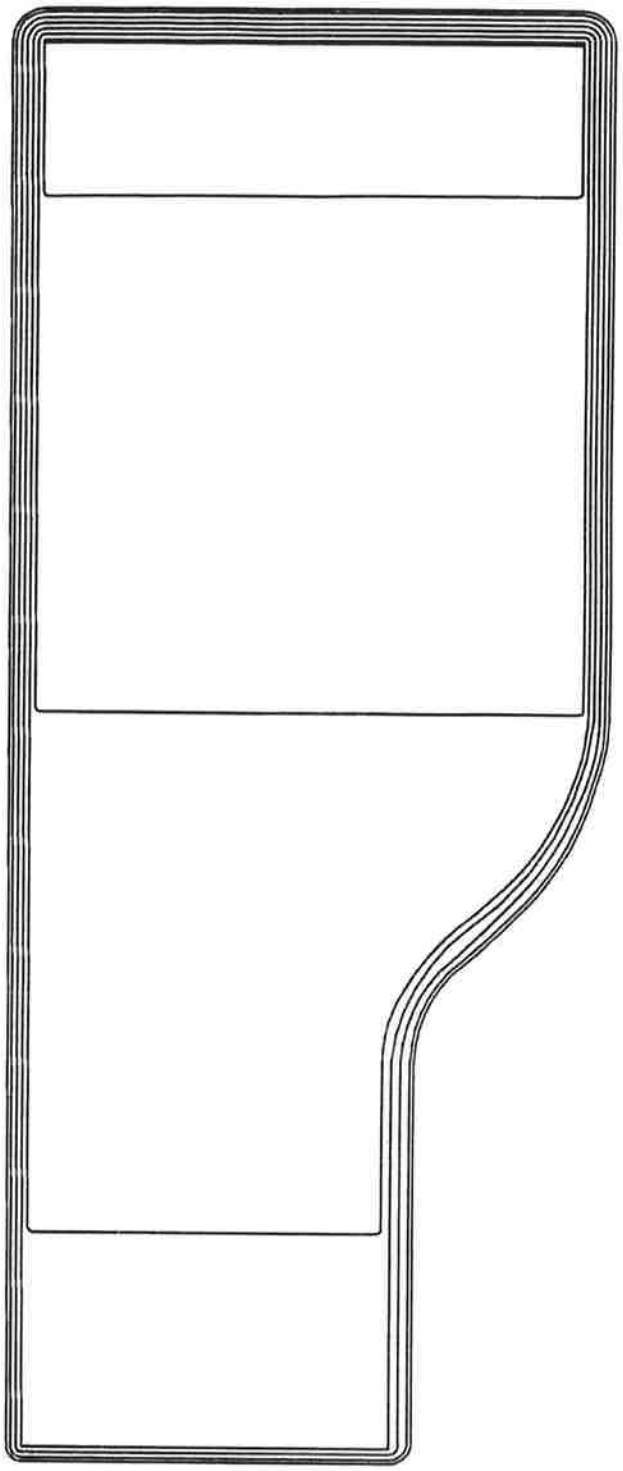
The project area has been determined to be 86.17 acres or 3,753,565 s.f. This includes the half width improved street sections for both Correll Road and Pitzer Road.

Required volume = 3" x 86.17 acres = 0.25' x (3,753,565 s.f.) = 938,391 c.f.

Design volume:

The basin is irregular and non-uniform in three dimensions and its long dimension runs south-north. The basin slopes at 0.35% from its shallowest area at the south end to the deeper section at the north end. The shallow end is five feet depth and the deep end is seven feet deep. However, because the basin bottom slopes at 0.35% from the shallow end to the deep end, the depth of water at the shallow end is 2.7' and at the deep end, 6.0' (1' free-board).

That is, a water surface elevation of 982.7 in the basin will yield a volume within the basin equal to 34,845 cubic yards or 940,815 cubic feet, which exceeds the 938,391 cubic feet required.



Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut yards	Fill yards	Net yards	Method
r19basin							
	r19basin2	r19bastop2	r19bas2	34845	0	34845 (C)	Grid

Attachment "H"

Miraluz/Heber Meadows Affordable Housing and State Route 86/Pitzer Road Improvement Project

Noise Study

May 2021

NOISE STUDY

MIRALUZ/HEBER MEADOWS AFFORDABLE HOUSING PROJECT

Prepared for:
Chelsea Investment Corporation
6339 Paseo Del Lago
Carlsbad, CA 92011

Prepared by:
Birdseye Planning Group, LLC
P.O. Box 1956
Vista, CA 92056
760-712-2199

May 21, 2021

Summary

The Summary includes the results of the noise impact analysis and key conclusions related to noise abatement. The purpose of this Noise Study is to determine noise impacts associated with construction and operation of the proposed Miraluz/Heber Meadows Affordable Housing Project and related improvements to the Pitzer Road/State Route 86 intersection.

The proposed project would subdivide APN 054-601-016 into five lots for the purpose of constructing a phased affordable housing project. A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

The site is part of the previously approved Heber Meadows project. The Heber Meadows project was comprised of 86 acres located west of Pitzer Road, south of East Correll Road, east of the Union Pacific Railroad tracks and north of 6th Street. The Heber Meadows project was initially approved in 2005 as a residential development. CEQA compliance was met with adoption of a Mitigated Negative Declaration (SCH#2004031098). The current project site was part of the larger project area but was never developed.

A condition of approval associated with the Heber Meadows project required improvements to the State Route (SR) 86/Pitzer Road intersection located approximately 2,000 feet south of the site. The northern Pitzer Road leg from SR-86 is currently closed. The southern Pitzer Road leg is stop controlled. The east/west movement is uncontrolled under existing conditions. Four alternatives were evaluated. The selected alternative would widen the existing intersection, construct the northbound connection to Pitzer Road and install a new signal. The existing roadway would be widened within the existing County of Imperial right of way (ROW) along Pitzer Road and California Department of Transportation (Caltrans) ROW along SR 86.

The project site is bordered by cultivated agricultural land to the north and east; single-family residential to the south (i.e., Heber Meadows) and the Heber Meadows (Jiggs Johnson) Neighborhood Park and vacant land west.

Existing noise levels were measured to be between 55.6 dBA Leq and 61.7 dBA Leq at the project site and 67 dBA at the intersection of SR-86 and Pitzer Road. With the project, noise levels would increase to a high of 59.4 dBA Leq along the east side of the project site and 65 dBA along SR-86. The project would not cause an exceedance of the County of Imperial noise standards for residential receivers or the 67 dBA Noise Abatement Criteria (NAC) at any sensitive properties located in proximity to the project site.

It has been determined through the following analysis that there would not be construction or operational noise impacts associated with the project. As such, no noise abatement measures were considered.

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List of Abbreviated Terms

CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibels
FHWA	Federal Highway Administration
Hz	Hertz
kHz	Kilohertz
L_{dn}	Day-Night Level
L_{eq}	Equivalent Sound Level
$L_{eq(h)}$	Equivalent Sound Level over one hour
L_{max}	Maximum Sound Level
LOS	Level of Service
L_{xx}	Percentile-Exceeded Sound Level
mPa	micro-Pascals
mph	miles per hour
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NSR	noise study reports
Protocol	Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
SPL	sound pressure level
TeNS	Caltrans' Technical Noise Supplement
TNM 2.5	FHWA Traffic Noise Model Version 2.5

Chapter 1. Introduction

The proposed project would subdivide APN 054-601-016 into five lots for the purpose of constructing a phased affordable housing project. A total of 320 units are proposed. Phase I would construct 64 units with subsequent phases constructed based on funding availability and market demand. The project would include various on-site amenities, parking, stormwater treatment and related infrastructure improvements.

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1.1. Purpose of the Noise Study Report

The purpose of the Noise Study Report (NSR) is to determine if changes in cumulative traffic volumes on neighboring streets associated with the proposed Miraluz project and improvements to the Pitzer Road/SR-86 intersection would adversely affect adjacent noise sensitive land uses. The project applicant will fund the proposed Project but Caltrans will construct the SR-86/Pitzer Road intersection improvements. The Project would be subject to environmental review pursuant to the California Environmental Quality Act (CEQA). Environmental documentation pursuant to the National Environmental Policy Act (NEPA) would not be required, as the Project would not receive federal funds. The County of Imperial is the lead agency under CEQA, and Caltrans District 11 is a Responsible Agency under CEQA.

Chapter 2. Project Description

As stated, the County of Imperial included improvements the SR-86/Pitzer Road intersection as a condition of approval for the Heber Meadows development project. To date, the project has constructed 178 of the 219 lots approved in 2005. The subject property was never developed nor were conditioned improvements to the SR-86/Pitzer Road intersection completed. The project would construct 320 multifamily units on a 16-acre portion of the Heber Meadows site. The total units would exceed those approved in 2005; thus, the project is being evaluated as a standalone project subject to the discretionary review process. Further, the County of Imperial is enforcing the approval condition mandating improvements to the SR-86/Pitzer Road intersection.

The SR-86/Pitzer Road intersection is currently a three-leg intersection, with stop control on northbound Pitzer Road. Currently, the north leg does not exist. Hence, the existing intersection geometry is as follows:

- Northbound: 1 shared left / right lane
- Westbound: 1 shared through / left-turn lane
- Eastbound: 1 shared through / right lane

Linscott, Law and Greenspan, Engineers (LLG) prepared an Intersection Control Evaluation (ICE) (March 2021) for the subject intersection. The analysis was prepared to objectively evaluate and screen intersection control alternatives. The intersection traffic control options which were assessed are minor-street stop, all-way stop, signalization, and roundabout control. The intersection control alternatives were analyzed using Year 2040 (Horizon Year) forecast traffic volumes including traffic generated by the planned Heber Meadows project.

The fourth (north) leg will be provided at this intersection and will provide direct access from SR 86 to the north, connecting to Correll Road. The following intersection geometry is proposed at the SR 86 / Pitzer Road intersection:

- Southbound: One left turn lane and one shared through / right-turn lane (New north leg)
- Westbound: One left turn lane, one through lane and one right-turn lane
- Northbound: One left turn lane and one shared through / right-turn lane
- Eastbound: One left turn lane and one shared through / right-turn lane

With these improvements, the intersection would complete the street network serving the project site and address operational deficiencies associated with project build out and cumulative traffic volumes.

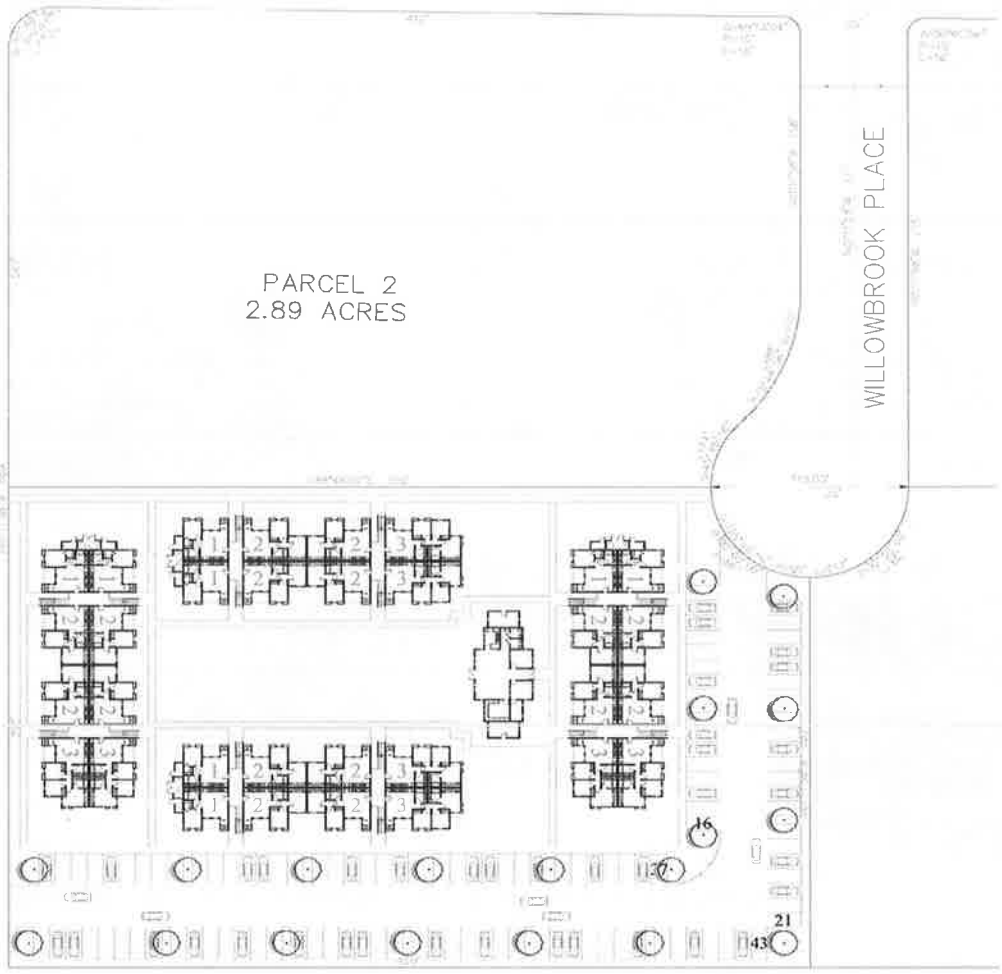
As described in the *Circulation and Scenic Highways Element*, Imperial County, January 29, 2008, State Route 86 (Heber Road) is generally a north-south route and begins near the Townsite of Heber as a two-lane conventional highway and ends at the Riverside County line as a four-lane expressway. In the vicinity of the SR-86/Pitzer Road intersection, SR 86 is built as 2-Lane Road oriented east/west. Curb, gutter and sidewalks are not provided. Bike lanes and bus stops are not provided and the speed limit is posted at 55 mph.

As described in the *Circulation and Scenic Highways Element*, Imperial County, January 29, 2008, Pitzer Road is a two-lane north-south facility, which will eventually connect Chick Road to Fawcett Road. It is currently paved between Chick Road and McCabe Road with an ADT of 1,500 and is principal route for traffic oriented to/from the Imperial Valley Mall. In the vicinity of the SR-86/Pitzer Road intersection, Pitzer Road is built as 2-Lane Road south of SR 86. Pitzer Road terminates just north of SR 86. Curb, gutter and sidewalks are not provided. No speed limit is posted.

For noise modeling purposes, the southern, western and eastern legs were extended approximately 2,000 feet in either direction. Four alternatives were considered; the Minor Street Stop Control (MSSC), All-Way Stop Control (AWSC), Traffic Signal and Roudabout. Figure 2-1 depicts the project site. Figure 2-2 depicts the proposed site plan. Figure 2-3 shows the conceptual signalized control at the Pitzer Road/SR-86 intersection.

These alternatives were developed to establish what the intersection configuration requirements for operations to perform at LOS C or better during both peak periods per Caltrans Guide for the Preparation of Traffic Impact Studies, "Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities". Additionally, providing manageable queuing lengths is another goal of the alternatives design. As these are two very different types of control strategies, there are differences in the overall intersection footprint and lane geometry needs. The proposed project would construct the signalized control alternative.

Figure 2-1—Project Vicinity ▭ **- Project Site** ● **- SR-86/Pitzer Road Intersection**



SITE PLAN

BUILDING DATA		PARKING DATA
16 1BR/1BA	583 SQ. FT	16/1BR X 1.4 = 22.8 PARKING SPACES
32 2BR/1BA	742 SQ. FT	32/2BR X 1.4 = 44.8 PARKING SPACES
16 3BR/2BA	938 SQ. FT	16/3BR X 1.4 = 22.4 PARKING SPACES
64 TOTAL UNITS		90.4 REQUIRED PARKING SPACES 117 PROVIDED PARKING SPACES
COMMUNITY BUILDING WITH LAUNDRY RM 1,960 SQ. FT.		

HEBER MEADOWS
CHELSEA INVESTMENT CORPORATION

THE McKINLEY ASSOC., INC.
ARCHITECTURE & PLANNING

MARCH 24, 2021

Figure 2-2 — Site Plan

Figure 2-3—Conceptual Signalized Control

Chapter 3. Fundamentals of Traffic Noise

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS (Caltrans, April 2020), a technical supplement to the Protocol, that is available on Caltrans Web site https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

3.1. Sound, Noise, and Acoustics

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

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

3.2. Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz) or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

3.3. Sound Pressure Levels and Decibels

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

3.4. Addition of Decibels

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

3.5. A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 3-1 describes typical A-weighted noise levels for various noise sources.

Table 3-1
Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 1998.

3.6. Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

3.7. Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq}[h]$) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

3.8. Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

3.8.1. Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each

doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

3.8.2. Ground Absorption

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.

3.8.3. Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

3.8.4. Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line

of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receiver is rarely effective in reducing noise because it does not create a solid barrier.

Chapter 4. Federal Regulations and State Policies

4.1. State Regulations

4.1.1. Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

This Traffic Noise Analysis Protocol (Protocol) specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. Table 4-1 summarizes noise abatement criteria (NAC) used in the Protocol corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

In identifying noise impacts, primary consideration is given to exterior areas of frequent human use. The closest receivers are single-family residences; thus, Activity Category B criterion are used as the basis for determining a noise impact. The Protocol defines a noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA. The Protocol also states that a sound level is considered to approach a NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The TeNS to the Protocol provides detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

Table 4-1
Activity Categories and Noise Abatement Criteria

Activity Category	Noise Abatement Criteria (Leq(h), dBA)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67 (Exterior)	Residential
C[2]	67 (Exterior)	Active sport areas amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit

		institutional structures, radio studios, recording studios, schools and television studios.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing.
G	--	Undeveloped lands that are not permitted.

Source: Caltrans, April 2020; see also 23 CFR Part 772, July 13, 2010

[1] The $L_{eq}(h)$ activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA).

2 Includes undeveloped lands permitted for this activity category.

4.2. County Imperial

Operational Noise. The Property Line Noise Limits listed in Table 9 of the County of Imperial General Plan Noise Element and the County's Ordinance, Title 9, Division 7 (Noise Abatement and Control) Section 90702.00 Subsection A provides acceptable Sound level limits based on the property zoning.

Stationary Noise. The applicable property line sound level limits are provided in Table 4-2 below and shall apply to noise generation from one property to an adjacent property. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate. These standards do not apply to construction noise.

Table 4-2:
Property Line Noise Level Limits

Zone	Time	Applicable Limit – One Hour Average Sound Level (decibles)
Residential Zones	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Multi-residential Zones	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial Zones	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
Light Industrial/Industrial Park Zones	Anytime	70
General Industrial Zones	Anytime	75

Zone	Time	Applicable Limit – One Hour Average Sound Level (decibles)
When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dB Leq. The sound level limit between two zoning districts (different land uses) shall be measured at the property line between the properties. Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of subsection A of this section, measured at or beyond six feet from the boundary of the easement upon which the equipment is located. This section does not apply to noise generated by helicopters at heliports or helistops authorized by a conditional use permit. This section does not apply to noise generated by standard agricultural field operating practices such as planting and harvesting of crops. The County of Imperial has a Right to Farm Ordinance (1031) which serves as recognition to agricultural practices to new development. Agricultural/industrial operations shall comply with the noise levels prescribed under the general industrial zones.		

Source: County of Imperial Ordinance, Title 9, Division 7 (Noise Abatement and Control)

The increase of noise levels generally results in an adverse impact to the noise environment. The Noise/Land Use Compatibility Guidelines are not intended to allow the increase of ambient noise levels up to the maximum without consideration of feasible noise reduction measures. The following guidelines are established by the County of Imperial for the evaluation of significant noise impact.

a. If the future noise level after the Project is completed will be within the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, but will result in an increase of 5 dB CNEL or greater, the Project will have a potentially significant noise impact and mitigation measures must be considered.

b. If the future noise level after the Project is completed will be greater than the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, a noise increase of 3 dB CNEL or greater shall be considered a potentially significant noise impact and mitigation measures must be considered.

Traffic Noise. The Imperial County General Plan Noise Element (2015) (Table 7), provides a range of land uses and compatibility criteria based on exterior noise levels. These standards are the same as those referenced in the California State Office of Planning and Research 2017 updates to the General Plan Guidelines, Appendix D Noise Element Guidelines, Figure 2. These data show that exterior noise levels up to 60 dBA (CNEL or Ldn) are normally compatible in rural residential areas. Noise levels up to 70

dBA (CNEL or Ldn) are conditionally compatible. For the purpose of identifying potential traffic-related impacts associated with the proposed project, these standards are used.

Construction Noise. The Noise Element of the County of Imperial General Plan defines a construction noise impact as noise generated from a single piece of construction equipment or a combination of equipment that exceeds 75 dBA Leq when averaged over an 8-hour period (Leq(8)) and measured at the nearest sensitive receptor (e.g., homes, schools, hospitals, parks, and office buildings, and for certain non-human species, including riparian bird species). In cases of extended-length construction times, the standard may be reduced so as to not exceed 75 dB Leq when averaged over a one-hour period. The Noise Element also limits construction equipment operation to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday and Sunday.

Chapter 5. Study Methods and Procedures

5.1. Methods for Identifying Land Uses and Selecting Noise Measurement and Modeled Receiver Locations

This section describes the process used to select modeled receiver and noise measurement locations.

Land uses in the project area were categorized in terms of activity categories (see Table 4-1). The receiver locations measured and modeled for the analysis was selected to represent the closest sensitive receptors to the project site: the project site, graded residential pads on the west side of Pitzer Road south of the project site and four residences located on the south side of SR-86 adjacent to and west of the Pitzer Road intersection. Noise measurements were conducted at three locations as shown on Figure 5-1.

5.2. Field Measurement Procedures

This section describes field measurement procedures. Short-term sound level measurements were conducted using an Piccolo II (ANSI Type 2) integrating sound level meter and statistical data logger. Instantaneous sound levels were measured, integrated, and recorded by the sound level meter in 0.1-second intervals. The sound level data collected included date, time, duration of measurement (in seconds), Leq, SEL, statistical sound levels (L90, L50, L33 and L10), Lmax, Lmin, and peak (A-weighted). The set-up consisted of mounting the sound level meter on a tripod with the microphone top at 4.5 feet above the ground surface level. Calibration of the sound level meter prior to measurements was performed using a sound power level of 94 dBA at a frequency of 1,000 Hz. Data forms are provided in Appendix A.

Forecast meteorological conditions were checked prior to the field measurement to determine whether acceptable conditions would prevail throughout the measurement period. The measurements were conducted on a day without measurable precipitation. Wind speeds were gusting between 3-5 miles per hour during the first two monitoring sessions and between 10-20 mph during the third measurement.

Figure 5-1—Project Vicinity

- Project Site
- SR-86/Pitzer Road Intersection
- Monitoring Locations

Measurements were taken at three locations: Monitoring Location 1 is located on the project site facing Pitzer Road approximately 50 feet west of the centerline. Monitoring Location 2 is located on the project site facing East Correll Road approximately 40 feet south of the centerline. Monitoring Location 3 is located at the southern terminus of Pitzer Road at the future intersection with SR-86 approximately 60 feet north of the centerline.

Land use to the north and east is agricultural land is light industrial; the Sweetwater River corridor is located to the south. A sixth location was chosen along the base of the bluff north of the project site because the area above is an approved location for multifamily residences constructed as part of Otay Ranch General Development Plan Village 3.

The project site is bordered by cultivated agricultural land to the north and east; single-family residential to the south (i.e., Heber Meadows) and the Heber Meadows (Jiggs Johnson) Neighborhood Park and vacant land west. Land use adjacent to the SR-86/Pitzer Road intersection is vacant land to the northeast and southeast, an equipment yard to the northwest and single-family residential on the southwest.

The number of heavy trucks, medium trucks, and automobiles were counted during each sound level measurement. The number of observed car, medium truck, and large truck trips was used to ensure consistency between the TNM model and existing traffic conditions. Existing noise levels, activity categories, NAC noise categories, and number of observed trips at each location measured are shown in Table 5-1.

Table 5-1
Existing Noise Levels in Project Area

Noise Measurement Location	Existing Measured Noise Level (dBA Leq)	Activity Category	NAC, Hourly A-Weighted Noise Level (dBA-Leq) (See Table 4-1)	Number of Trips Observed During Measurement (20 minutes)
1. Project site facing Pitzer Road approximately 50 feet west of the centerline.	55.6	B[2]	67 Exterior	3 Cars 1 Medium Trucks 0 Large Trucks
2. On the project site facing East Correll Road approximately 40 feet south of the centerline.	61.7	B[2]	67 Exterior	8 Cars 0 Medium Trucks 0 Large Trucks

Table 5-1
Existing Noise Levels in Project Area

Noise Measurement Location	Existing Measured Noise Level (dBA Leq)	Activity Category	NAC, Hourly A-Weighted Noise Level (dBA-Leq) (See Table 4-1)	Number of Trips Observed During Measurement (20 minutes)
3. Southern terminus of Pitzer Road at the future intersection with SR-86 approximately 60 feet north of the centerline.	67.0	B[2]	67 Exterior	50 Cars 2 Medium Truck 2 Large Trucks

Note: Activity categories consistent with CaTNAP Protocol, September 2020.

5.3. Noise Prediction Methods

Traffic and construction noise modeling methods used to predict noise levels are described in this section. The FHWA Traffic Noise Model (TNM) was used to model traffic noise increases at the nearest sensitive receptor locations to the project site. The model was developed based on aerial photographs. Vehicle travel inputs on each roadway was based on the number of car, medium truck, and heavy truck trips observed during the site visit. In the absence of observations regarding vehicle mix, truck travel was estimated based on traffic counts during monitoring.

TNM uses algorithms based on speed to calculate the average sound level produced by the three vehicle types of concern (autos, medium-duty trucks, and heavy-duty trucks). Average speeds used in the analysis were based on speeds observed during the site visit. The location of road lanes, elevations, and sensitive receptors were input into TNM. The study area is flat so no adjustments to the model were made to account for topography.

TNM was used to calculate existing conditions and full buildout of the project assuming a 2040 cumulative traffic volume scenario. The noise model was checked for calibration based on the field noise measurements conducted at the site. The measured sound levels were calculated to yield a dBA Leq that was +/- 2 dBA for receivers along Pitzer Road. Because of wind conditions at Measurement Location 3, TNM was not calibrated to closer approximately measured conditions.

The TNM model inputs reflect future traffic in the area accommodated by the project to reflect a maximum impact scenario. The model likely overestimates the increase in noise

associated with the traffic because it accounts for cumulative growth in the area that is not associated with the project.

The field measurements and the TNM model are subject to errors. Field measurements are essentially a "snapshot" in time and are indicative of the environmental conditions and travel patterns that existed on the day and time of the measurements, which can vary substantially from day to day and season to season. The noise model is subject to the limitations of the data readily available including the accuracy of elevations taken from the digital maps as compared to actual field conditions. The accuracy of the sound levels reported in this study is considered to be in the ±2 dB range.

Chapter 6. Existing Noise Environment

Information relating to the existing noise environment is summarized in this section.

6.1. Existing Land Uses

The project site itself is a 16-acre site located at the southwest corner of Pitzer Road and East Correll Road that would be developed with a 5-phase affordable housing project. The SR-86/Pitzer Road intersection would be improved as part of the project as described herein. For the purpose of this analysis, the intersection improvements modeled traffic noise approximately 2,000 feet in all directions from the intersection. Land use along Pitzer Road is dominated by agricultural land along the east side. Similarly, agricultural land is the predominant use along SR-86 east of Pitzer Road. Land use west of the Pitzer Road intersection and along the west side of Pitzer Road is a mix of commercial and residential. As such, existing land uses in the project area can be categorized as activity categories B, E and F (see Table 4-1).

Although all developed land uses are evaluated in this analysis, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. The only areas of frequent human use would be the rear yards of residential buildings construction as part of the project and future residences constructed on graded pads located south of the project site on the west side of Pitzer Road. The residences located along the south side of SR-86 west of Pitzer Road all front SR-86. No frequently used areas occur within this area.

Chapter 7. Future Noise Environment, Impacts, and Considered Abatement

This section discusses the predicted traffic noise level under existing, opening day (year 2017), and long-term (year 2037) conditions, identifies traffic noise impacts, and considers noise abatement.

7.1. Future Noise Environment and Impacts

The TNM modeling results for the project are shown in Table 7-1. Figure 7-1 shows the location of the modeled receivers.

Table 7-1. Modeled Noise Impacts at Closest Sensitive Receptors

Receptor	Existing Leq	With Project Leq	Decibel Change	Significant Impact
1. Project site near northeast corner	57.6	59.4	+1.8	No
2. Project site near center of the site adjacent to Pitzer Road	58.0	59.7	+1.7	No
3. Single-family residence graded pad 1 on east side of future Willowbrook Road	58.2	59.8	+0.6	No
4. Single-family residence at graded pad 2 on the east side of Willowbrook Road	58.3	60.0	+.1.7	No
5. Single-family residence at southwest corner of SR-86 and Pitzer Road intersection	63.6	65.0	+1.4	No
6. Single-family residence at 197 Heber Road	63.3	64.9	+1.7	No
7. Single-family residence at 195 Heber Road	63.3	64.9	+1.7	No
8. Single-family residence at 179 Heber Road	63.9	64.9	+1.0	No

These receivers are located along the east side of the project site adjacent to Pitzer Road and along the south side of SR-86 west of Pitzer Road. These receivers are categorized as Activity Category B land uses. As discussed above, traffic noise impacts are considered to occur at receiver locations where predicted design-year noise levels are at least 12 dB greater than existing noise levels, or where predicted design year noise levels approach or exceed the NAC for the applicable activity category. Modeling results indicate that

Figure 7-1—Receiver Locations - Project Site

- SR-86/Pitzer Road Intersection
- Receiver Locations

neither existing nor long-term noise from traffic volumes exceeds the NAC of 67 dBA $L_{eq}(h)$ for Activity Category B land uses. Further, long-term traffic noise is projected to be less than a 12 dB increase when compared to existing traffic noise. The highest increase (+1.8) would be at Receivers 1 located at the northeast corner of the Heber Meadows project site. This increase would be primarily a result of higher traffic volumes on both Pitzer Road and East Carroll Road to the north under cumulative conditions rather than geometric changes associated with the project. Residences represented by Receivers 4-8 are located along the south side of SR-86. Noise levels would increase by less than 2 dBA as a result of modified geometrics and cumulative traffic volumes. The modeled noise levels would not exceed Imperial County compatibility guidelines as long-term traffic noise volumes would be within the compatibility range allowed per the Imperial County General Plan Noise Element. Therefore, no significant traffic noise impacts are predicted to occur at sensitive receptor land uses within the project area, and noise abatement will not be considered.

Chapter 8. Construction Noise

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans Standard Specifications Section 14-8.02 (2010), which states that noise levels generated during construction shall not exceed 86 dBA LMax at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m. and that all internal combustion engines on the job site must be equipped with the manufacturer recommended muffler.

As stated, the Noise Element of the County of Imperial General Plan defines a construction noise impact as noise generated from a single piece of construction equipment or a combination of equipment that exceeds 75 dBA Leq when averaged over an 8-hour period (Leq(8)) and measured at the nearest sensitive receptor (e.g., homes, schools, hospitals, parks, and office buildings, and for certain non-human species, including riparian bird species). In cases of extended-length construction times, the standard may be reduced so as to not exceed 75 dB Leq when averaged over a one-hour period. The Noise Element also limits construction equipment operation to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday and Sunday.

Table 8-1 summarizes noise levels produced by construction equipment that is commonly used on roadway and bridge construction projects. Construction equipment is expected to generate noise levels ranging from 82 to 93 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 8-1
Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80

Pneumatic Tools	85
Concrete Pump	82
Pile Driver	93

Source: Federal Transit Administration 1995.
Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987.

No adverse noise impacts associated with construction of the SR-86/Pitzer Road intersection are anticipated because construction would be conducted in accordance with Caltrans Standard Specifications Section 14-8.02 and applicable Imperial County noise standards. Therefore, construction equipment would not cause a significant increase in noise in the area. Implementing the following measures would minimize temporary noise from construction:

- All equipment will have sound-control devices that are no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust.
- As directed by Caltrans, the contractor will implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

With respect to construction of the Heber Meadows Affordable Housing project, construction noise would likely be audible at receivers located in proximity to the site. However, the proposed project would comply with limitations on hours of construction activity defined above. It is possible that noise levels would exceed 75 dBA at the southern property line; construction equipment are transient rather than stationary sources. Thus, noise levels are not likely to exceed a 75 dBA average over an 8-hour workday. While no noise mitigation is required, temporary construction noise could be reduced through implementation of the following measures at the contractor's discretion:

> **N-1: Construction Equipment**. Electrical power shall be used to run air compressors and similar power tools. Internal combustion engines should be equipped with a muffler of a type recommended by the manufacturer and in good repair. All diesel equipment should be operated with closed engine doors and should be equipped with factory-recommended mufflers.

Construction equipment that continues to generate substantial noise at the project boundaries should be shielded with temporary noise barriers, such as barriers that meet a sound transmission class (STC) rating of 25, sound absorptive panels, or sound blankets on individual pieces of construction equipment. Stationary noise-generating equipment, such as generators and compressors, should be located as far as practically possible from the nearest residential property lines.

N-2: **Limit Operations Adjacent to Receivers**. Limit the number of large pieces of equipment (i.e., bulldozers or concrete mixers) operating adjacent to receivers to one at any given time to the extent feasible.

N-3: Neighbor Notification. Provide notification to residential occupants nearest to the project site 7-14 days prior to initiation of construction activities that could result in noise levels exceeding 75 dBA at the property line adjacent to residences. This notification should include the anticipated hours and duration of construction and a description of noise reduction measures being implemented at the project site. The notification should include a telephone number for local residents to call to submit complaints associated with construction noise. The notification should be posted along SR-74 and be visible.

With implementation of Caltrans Standard Specifications Section 14-8.02 and the above referenced noise control, if needed and at the County's discretion, temporary noise impacts would be **less than significant**.

Chapter 9. References

Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987

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California Department of Transportation (Caltrans). 2020. Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction Projects and Retrofit Barrier Projects. Division of Environmental Analysis. Sacramento, CA. April. Available at https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

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County of Imperial, 2003. General Plan Noise Element.

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FHWA. 2004. U.S. Department of Transportation, FHWA Traffic Noise Model, TNM 2.5, Report No. FHWA -PD -96 -010, Revision No. 1. April 14.

Federal Transit Administration. September 2018. *Transit noise and Vibration Impact Assessment Manual.* (FTA Report 0123). Prepared by John A. Volpe National Transportation Systems Center. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Linscott, Law and Greenspan, Inc. *Intersection Control Evaluation, SR 86 / Pitzer Road,* Imperial County, California, March 31, 2021

Appendix A Noise Monitoring Data

FIELD NOISE MEASUREMENT DATA

Project Name: ICEBERG MEADOWS — Page 1 of
Project #: — Day / Date: MARCH 23, 2021 — My Name:

Sound Level Meter	Calibrator	Weather Meter
Model #: Piccolo II	Model #	Model # — Serial #
Serial #	Serial #	
Weighting: (A) / C / Flat	Pre-Test: 94 dBA SPL	Terrain: Hard / Soft / (Mixed)
Response: (Slow) / Fast / Impl	Post-Test: 94 dBA SPL	Topo: (Flat) / Hilly (describe)
Windscreen: (Yes) / No		Wind: (Steady) / Gusty

ID	Time Start	Time Stop	Leq	Lmin	Lmax	L10	L50	L90	Wind Spd/ Dir (mph)	Temp (°F)	RH (%)	Bar Psr (in Hg)	Cloud Cover (%)
1	7:40	7:55	55.6	40.2	70.9				VARIABLE	60			0-1
2	8:00	8:15	60.7	43.6	78.5				10 KTS	60			0-1
3	8:25	8:40	67.0	46.6	82.6								

Roadway Name: PITZER

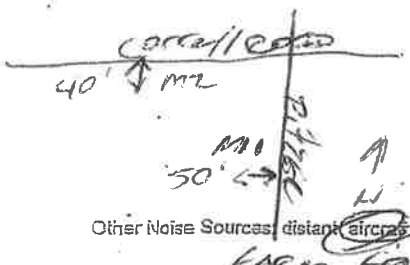
Speed (post/obs)	35
Number of Lanes	2
Width (pave/row)	24
1- or 2- way	2
Grade	0%
Bus Stops	NO
Stoplights	NO
Street Parking	NO
Automobiles	3
Medium Trucks	1
Heavy Trucks	0

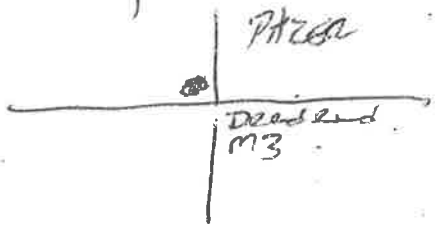
EAST CORRELL

40
2
24
2
0%
NO
NO
8
0
0

SR Location(s) / GPS Reading(s):

PITZER
50
2
24
2
0%
NO
STOP SIGN @ PITZER
50
2
1





Other Noise Sources: distant aircraft / roadway traffic / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

FROM GOLF CART / AIRCRAFT

Notes and Sketches on Reverse

Site 1 - Pitzer Road	
Start Date	3/23/2021
Start Time	7:48:01 AM
End Time	8:03:01 AM
Duration	00:15:00
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Fast
LN% Freq Weight	dBA
Overload	No
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	83.6
LCeq	78.0
LAeq	55.6
LZFmax	98.5
LCFmax	91.0
LAFmax	70.0
LZFmin	60.9
LCFmin	54.8
LAFmin	40.5
LZE	113.1
LCE	107.5
LAE	85.1
LZpeak	105.8
LCpeak	100.5
LApeak	86.0
1%	67.6
2%	65.5
5%	61.0
8%	59.2
10%	58.4
25%	54.6
50%	50.0
90%	44.9
95%	44.0
99%	42.5

Site 2 - East Correll Road

Start Date	3/23/2021
Start Time	8:08:32 AM
End Time	8:23:31 AM
Duration	00:14:59
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Fast
LN% Freq Weight	dBA
Overload	Yes
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	91.9
LCeq	86.7
LAeq	61.7
LZFmax	106.6
LCFmax	101.1
LAFmax	78.5
LZFmin	74.4
LCFmin	68.0
LAFmin	43.6
LZE	121.4
LCE	116.2
LAE	91.2
LZpeak	114.8
LCpeak	112.9
LApeak	94.0
1%	71.7
2%	69.9
5%	67.5
8%	66.3
10%	65.5
25%	61.5
50%	57.4
90%	51.0
95%	49.4
99%	46.9

SR-86/Pizter Road

Start Date	3/23/2021
Start Time	8:28:48 AM
End Time	8:43:47 AM
Duration	00:14:59
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Fast
LN% Freq Weight	dBA
Overload	Yes
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	92.6
LCeq	87.4
LAeq	67.0
LZFmax	108.2
LCFmax	101.9
LAFmax	82.6
LZFmin	61.0
LCFmin	57.0
LAFmin	46.9
LZE	122.1
LCE	116.9
LAE	96.5
LZpeak	115.3
LCpeak	111.5
LApeak	97.2
1%	76.5
2%	74.9
5%	72.9
8%	71.8
10%	71.0
25%	67.0
50%	62.2
90%	54.5
95%	52.1
99%	49.2

<Organization?>
<Analysis By?>

13 April 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Heber Meadows Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Receiver2	2	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
Receiver3	3	1	0.0	58.2	66	58.2	10	----	58.2	0.0	8	-8.0
Receiver4	4	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
Receiver5	5	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
Receiver6	6	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
Receiver7	7	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
Receiver8	8	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>
<Analysis By?>

13 April 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Heber Meadows w-Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
Receiver2	2	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
Receiver3	3	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
Receiver4	4	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
Receiver5	5	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Receiver6	6	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Receiver7	7	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Receiver8	8	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Attachment "I"

LINSCOTT
LAW &
GREENSPAN
engineers

TRANSPORTATION IMPACT ANALYSIS
HEBER MEADOWS
Imperial County, California
November 19, 2020

LLG Ref. 3-20-3289

Prepared by:

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TRANSPORTATION IMPACT ANALYSIS

HEBER MEADOWS

Imperial County, California
November 19, 2020

1.0 PROJECT AND STUDY DESCRIPTION

Linscott, Law and Greenspan, Engineers (LLG) has prepared this Vehicle Miles Traveled (VMT) and Local Mobility Analyses report to assess the impacts to the street system as a result of the 320-unit Heber Meadows Project, located in Imperial County.

The traffic analysis presented in this report includes the following:

Section 1. Project and Study Description.
Section 2. Project VMT Per Capita
Section 3. Methodology and Thresholds
Section 4. Substantial Effects Criteria
Section 5. Existing Conditions
Section 6. Project Traffic
Section 7. Existing + Project Analysis
Section 8. Cumulative Traffic Volumes
Section 9. Near-Term Analysis
Section 10. Site Access Analysis
Section 11. Active Transportation Analysis
Section 12. Improvements and Recommendations

1.1 Project Location and Vicinity Map

The site is located on the southwest corner of the Pitzer Road / Correll Road intersection in the County of Imperial between Bloomfield Street and Pitzer Road.

Figure 1–1 is the Vicinity Map depicting the Project location and the vicinity.

1.2 Project Size and Description

As described above, Heber Meadows is a multi-family apartment project in Imperial County. A total of 320 multi-family units are proposed on five parcels. 60 units each are proposed on Parcels #1 through #4. Parcel #5 will include 80 units.

1.3 Project Access

The following access is proposed:

- A new cul-de-sac, Willowbrook Place will provide access for Parcels #1 through #4 to Correll Road
- Parcels #1 and #2 will have one access each to Bloomfield Street and Willowbrook Place.
- Parcel #3 will have one access each to Correll Road and Willowbrook Place
- Parcel #4 will have one access Willowbrook Place and an emergency only access to Correll Road via Parcel #4.
- Parcel #5 will have two access points from Pitzer Road

Figure 1–2 depicts the site, whereas Figure 1-3 depicts the Parcel 1 Site Plan.

1.4 Pitzer Road / SR 86 Intersection

Currently, the Pitzer Road SR 86 intersection is a T-intersection with no north leg and a one-way STOP control. The Project will construct the north leg and complete this intersection with a signal or a roundabout control as a Project feature, prior to the first unit being constructed. For the purposes of the analysis of future conditions in this report, it is assumed that this intersection is a four-leg intersection with a traffic signal control.

1.5 Proposed Project Opening Year and Analysis Scenarios

The proposed Project opening year is 2022. The following analysis scenarios are analyzed in this study.

- Existing
- Existing + Project
- Existing + Project + Cumulative Projects

The Project is proposed to be built in phases. This traffic study accounts for phasing by determining the number of units which can be built before an individual impact occurs.

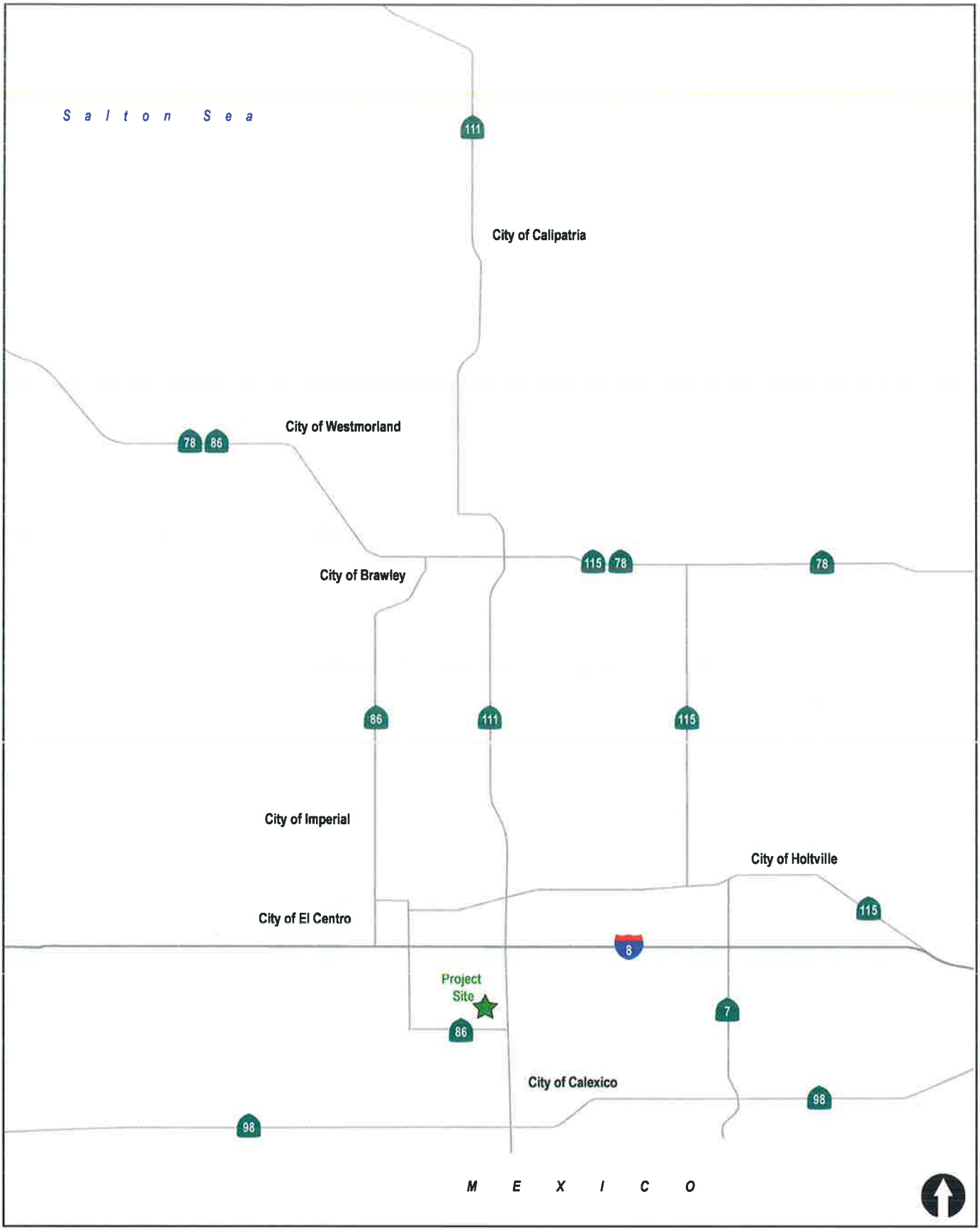

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Figure 1-1

Vicinity Map

HEBER MEADOWS

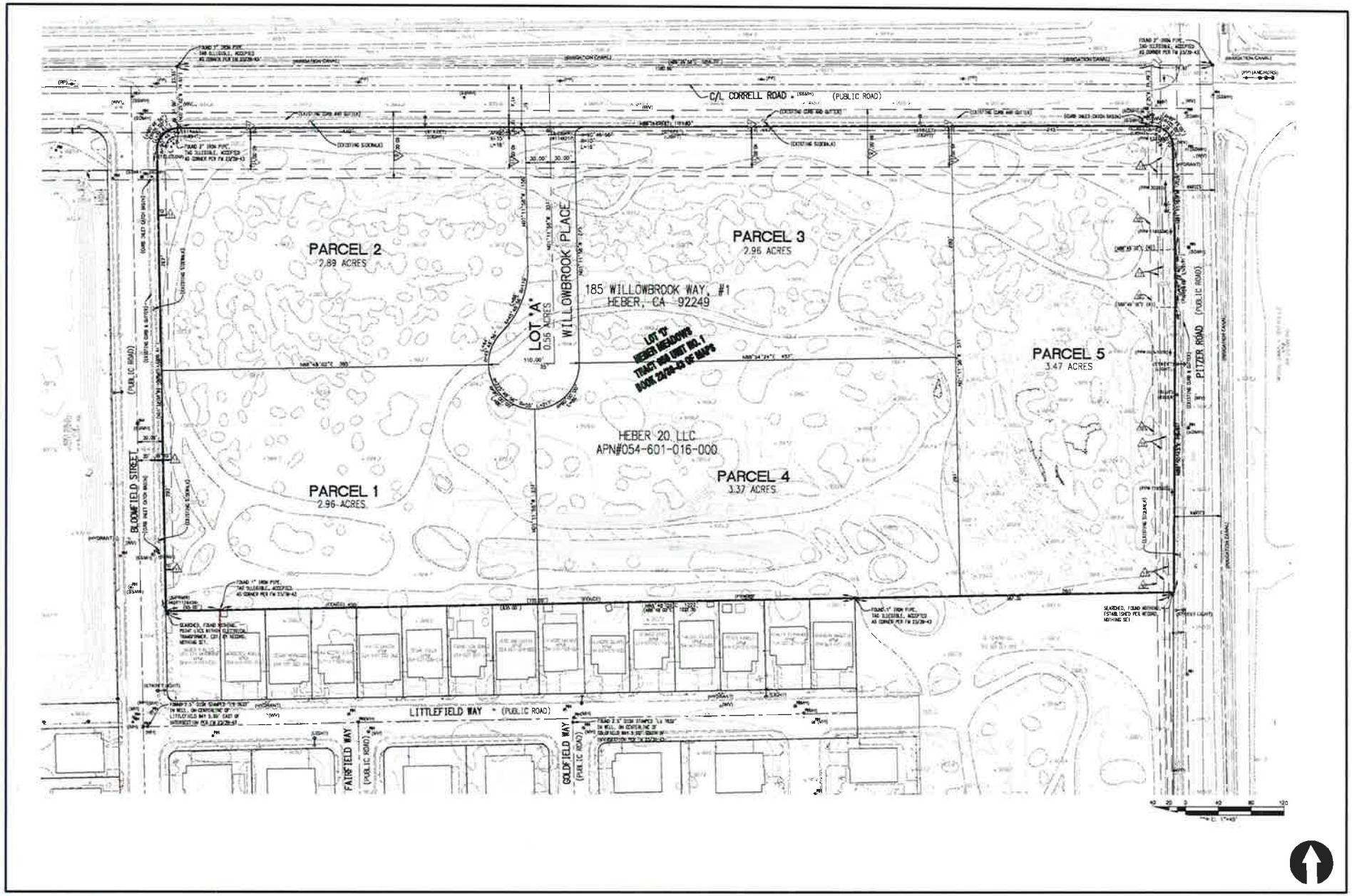

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Figure 1-2

Project Site

HEBER MEADOWS

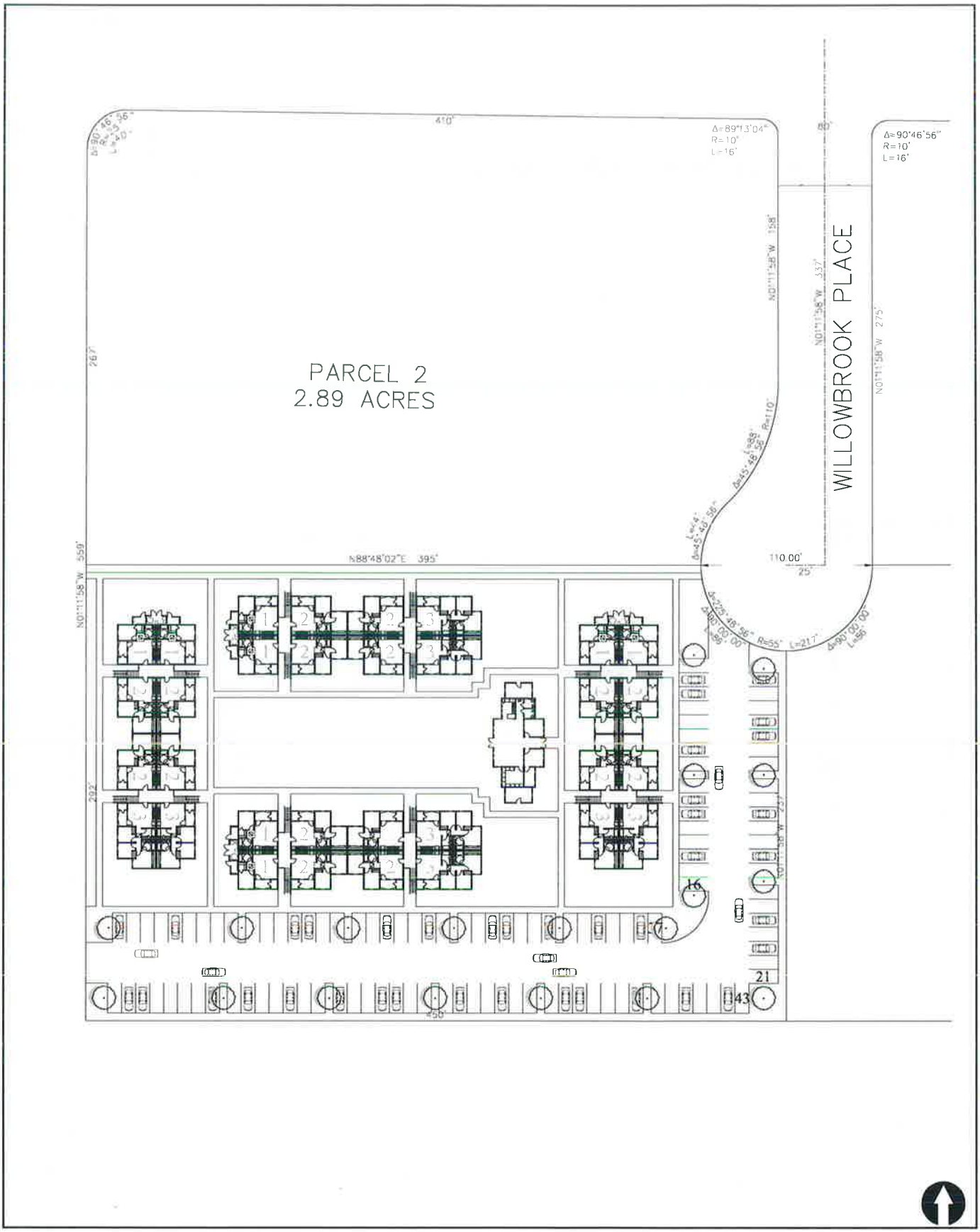

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Figure 1-3

Parcel 1 - Site Plan

HEBER MEADOWS

2.0 PROJECT VMT PER CAPITA

2.1 Background

In September 2013, the Governor's Office signed SB 743 into law, starting a process that fundamentally changes the way transportation impact analysis is conducted under CEQA. These changes include the elimination of auto delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. The justification for this paradigm shift is that Auto Delay/LOS impacts lead to improvements that increase roadway capacity and therefore induce more traffic and greenhouse gas emissions. The VMT standard for evaluating transportation impacts under CEQA became mandatory statewide on July 1, 2020.

VMT is defined as a measurement of miles traveled by vehicles within a specified region and for a specified time period. VMT is a measure of the use and efficiency of the transportation network. VMT's are calculated based on individual vehicle trips generated and their associated trip lengths. VMT accounts for two-way (round trip) travel and is typically estimated on a weekday for the purpose of measuring potential transportation impacts.

2.2 Significance Threshold

Since the County of Imperial has not yet formally developed draft guidelines or adopted significance criteria and technical methodologies for VMT analysis, LLG utilized OPR guidance from the Technical Advisory and Caltrans Regional Guidelines to develop significance thresholds and technical methodologies for this Project.

Guidance from OPR's Technical Advisory is used to establish a significance threshold of a minimum 15% reduction or more from the Regional average resident VMT per capita for this project evaluation. That means that if the Project's resident VMT per capita is more than 15% below the regional average, no significant transportation impact would result.

2.3 VMT Methodology

The VMT assessment was conducted using California Statewide Travel Demand Model (CSTDM) data provided by Caltrans. The following is a summary of steps involved in calculating the trip length and Region-wide VMT:

- Step 1. Determine the project analysis zone
- Step 2. Determine the VMT per capita for the zone where proposed Project is located.
- Step 3. Determine the VMT per capita within the County of Imperial representing the Regional VMT per capita.
- Step 4. Compare the VMT per capita from Step 2, against the Regional VMT per capita.

Per the CSTDM, the Resident VMT per Capita can be utilized at both the regional and census tract level.

2.4 VMT Assessment

Caltrans provides Transportation Analysis Zone (TAZs) maps which provide information for each zone. The Project site is located in the County of Imperial which includes total 17 zones representing the Imperial Region. ***Table 2-1*** tabulates average regional VMT per Capita and the significance threshold. ***Attachment A*** contains the calculation of average regional VMT data.

TABLE 2–1
REGIONAL VMT PER CAPITA AND THRESHOLD

Region [a]	Significance Threshold [b]
8.81 Miles	7.49 Miles

Footnotes:

a. Regional resident VMT per Capita information is obtained from the CSTDM database.
b. 15% below the Regional average Resident VMT per capita.

Caltrans guidelines suggest that the VMT analysis is recommended based on the project location and zoning. The Project site is located in the Traffic Analysis Zone (TAZ) 5608. VMT per capita for TAZ 5608 is 6.88 miles.

2.5 VMT Result

As shown in ***Table 2-2***, the Project's resident VMT per capita (6.88 miles) is calculated to be less than the threshold established (7.49 miles). Therefore, the Project has no significant transportation CEQA impact.

TABLE 2-2
VMT PER RESIDENT COMPARISON

Regional a	Threshold [b]	Project [c]	Significant Transportation Impact?
8.81 miles	7.49 Miles	6.88 Miles	None

Footnotes:

a. Regional Average Resident VMT per Capita information is obtained from the CSTDM database.
b. Threshold is 15% below the Regional Average Resident VMT per Capita.
c. Project Resident VMT per Capita information is obtained from the CSTDM database

3.0 METHODOLOGY AND THRESHOLDS

3.1 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized intersections, unsignalized intersections and roadway segments.

In the Highway Capacity Manual (HCM) 6th Edition, LOS for signalized intersections is defined in terms of delay. The LOS analysis provides results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. ***Table 3–1*** summarizes the signalized intersections levels of service descriptions.

3.1.1 *Signalized Intersections*

Table 3–2 depicts the criteria, which are based on the average control delay for any particular minor movement (unsignalized intersections) and overall intersection (signalized intersections).

For signalized intersections, LOS criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

LOS A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of Average delay.

LOS C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

TABLE 3–1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

LOS	Description
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	Considered to be unacceptable to most drivers. This condition often occurs with over saturation i.e. when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels

TABLE 3–2
INTERSECTION LEVEL OF SERVICE (LOS) & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: Highway Capacity Manual 6.

LOS D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are frequent.

LOS E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

3.1.2 *Unsignalized Intersections*

For unsignalized intersections, LOS is determined by the computed or measured control delay and is defined for each minor movement. For All-Way-Stop-controlled (AWSC) intersections, the overall intersection delay is reported. For two-way-stop-controlled (TWSC) intersections, LOS is not defined for the intersection as a whole, but the worst-case movement (typically the minor street left-turn) delay and LOS are reported.

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This LOS is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits.

LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

3.1.3 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the Imperial County's Level of Threshold Volumes for Various Roadway Types (ADT) table (***Table 3-3***). This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

TABLE 3-3
IMPERIAL COUNTY STANDARD STREET CLASSIFICATION
AVERAGE DAILY VEHICLE TRIPS

Road		Level of Service				
Class	X-Section	A	B	C	D	E
Expressway	154/210	30,000	42,000	60,000	70,000	80,000
Prime Arterial	106/136	22,200	37,000	44,600	50,000	57,000
Minor Arterial	82/102	14,800	24,700	29,600	33,400	37,000
Collector	64/84	13,700	22,800	27,400	30,800	34,200
Local Collector	40/70	1,900	4,100	7,100	10,900	16,200
Residential Street	40/60	*	*	<1,500	*	*
Residential Cul-de-Sac / Loop Street	40/60	*	*	< 200	*	*
Industrial Collector	76/96	5,000	10,000	14,000	17,000	20,000
Industrial Local Street	44/64	2,500	5,000	7,000	8,500	10,000

* Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

4.0 SUBSTANTIAL EFFECT CRITERIA

The County of Imperial does not have published substantial effect criteria. However, the County General Plan does state that the level of service (LOS) goal for intersections and roadway segments is to operate at LOS C or better. Therefore, if a segment degrades from LOS C or better to LOS D or worse with the addition of project traffic, the Project has a substantial effect. If the location operates at LOS D or worse with and without project traffic, the project has a substantial effect if the project causes the intersection delta to increase by more than two (2) seconds, or the V/C ratio to increase by more than 0.02.

TABLE 5–1
TRAFFIC IMPACT SUBSTANTIAL EFFECT CRITERIA

Level of Service with Project [a]	Allowable Increase Due to Project Impacts [b]					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
D, E & F (*or ramp meter delays above 15 minutes*)	0.01	1	0.02	1	2	2[c]

Footnotes:

a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume. The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

b. If a proposed project's traffic causes the values shown in the table to be exceeded, the Project has a substantial effect. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating Project's substantial effect.

c. The allowable increase in delay at a ramp meter with more than 15 minutes of delay and freeway LOS E is 2 minutes and at LOS F is 1 minute.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service

5.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project area. ***Figure 6–1*** shows an existing conditions diagram, including signalized/un-signalized intersections and lane configurations.

5.1 Existing Transportation Conditions

The facilities analyzed in this report fall under the jurisdiction of the Imperial County. The following is a brief description of the streets in the project area:

Dogwood Road

Dogwood Road is classified as a 6-Lane Prime Arterial in the Imperial County Circulation and Scenic Highways Element. Currently, Dogwood Road is constructed as a 3-Lane Collector with two lanes southbound and one lane northbound and a Two-Way Left-Turn Lane between W. Black Hills Road and Hawk Street. Between Hawk Street and 600 feet north of E. Hebe Road, Dogwood Road is currently a 4-lane Collector. South of 600 feet north of E. Hebe Road, Dogwood Road transitions to a 2-Lane Collector. The posted speed limit is 35 mph within the Project study area. Curb, gutter and sidewalks are provided between Black Hills Road and Correll Road, on the west side of the roadway. Curbside parking is not permitted. Bicycle Bike lanes are also provided.

Pitzer Road

Pitzer Road is classified as a 4-Lane Major Road in the Imperial County Circulation and Scenic Highways Element a two-lane north-south facility. Currently, in the study area, Pitzer is built as a 2-Lane Road between McCabe Road and just north of, but not connected to SR 86. Pitzer Road continues south of SR 86 as a 2-Lane Road. Bike lanes or bus stops are not provided. Curb and gutter and sidewalks are only provided intermittently on the west side of Pitzer Road between Correll Road and Meridian Street. Curbside parking is prohibited along both sides of the roadway. The speed limit is not posted.

E. McCabe Road

McCabe Road is classified as a 6-Lane Prime Arterial in the Imperial County Circulation and Scenic Highways Element. McCabe Road is currently built as as a 2-Lane Collector between Dogwood Road and Pitzer Road and a 4-Lane Facility between Pitzer Road and SR 111.. Bike lanes or bus stops are not provided and the speed limit is posted at 55 mph. Curbside parking is prohibited along both sides of the roadway.

Correll Road

Correll Road is classified as a 4-Lane Minor Arterial between Dogwood Road and SR 111 in the Imperial County Circulation and Scenic Highways Element. Currently, it is built as a 2-Lane Collector between Dogwood Road and Pitzer Road. Correll Road does not currently exist between Pitzer Road and SR 111. Bike lanes or bus stops are not provided and the speed limit is posted at 55 mph. A portion

of McCabe Road from Brockman Road to La Brucherie Road is designated as a Class II bike route. Curbside parking is prohibited along both sides of the roadway.

SR-86 (Heber Road)

State Route 86 (Heber Road) is classified as a 6-Lane Prime Arterial between Dogwood Road and SR 111 in the in the Imperial County Circulation and Scenic Highways Element. Currently, it is built as 2-Lane Road. Bike lanes or bus stops are not provided and the speed limit is posted at 55 mph. Curbside parking is prohibited along both sides of the roadway.

5.2 Existing Traffic Volumes – AM and PM Peak Hour and ADT

Due to the current Covid situation, traffic counts conducted at this time do not reflect the normal traffic volumes. Hence, research was conducted to identify historical traffic volume counts in the Project study area. Historical ADT counts were obtained for two SR 86 segments from the Caltrans Traffic Census website: https://dot.ca.gov/programs/traffic-operations/census.

Table 5-1 summarizes the Year 2017 counts from the Traffic Census website. The volumes were compared to the Year 2020 (Covid) counts. As seen in *Table 2-1*, the Pre-Covid counts are an average of 32% higher than the year 2020 counts. This factor was rounded up to 40% and applied to the Year 2020 (Covid) segment and intersection counts to obtain the actual volumes. The Year 2017 volumes on SR 86 were used in the analysis without applying the factor.

Appendix A contains the count sheets. The adjusted segment volumes are summarized in ***Table 5-2***.

TABLE 5-1
COVID FACTOR

Segment	Year 2020 (Covid) Counts	Year 2017 (Pre Covid) Counts	Factor (%)
SR 86			
West of Pitzer Rd	4,415	5,900	134%
East of Pitzer Rd	4,234	5,500	130%
Average			**132%**
Round up and Use			**140%**

TABLE 5-2
EXISTING TRAFFIC VOLUMES ADJUSTED FOR COVID

Segment	ADT [a]
Dogwood Road	
North of Correll Rd	15,850
South of Correll Rd	10,110
E. McCabe Rd	
West of Pitzer Rd	1,520
West of Pitzer Rd	5,280
Pitzer Road	
McCabe Rd to Correll Rd	990
SR 86	
West of Pitzer Rd	5,900 [b]
East of Pitzer Rd	5,500 [b]

Footnote:

a. Average Daily Traffic adjusted as described in Section 4.2 above, applying the Covid factor in *Table 4-1*.

b. Year 2017 volumes from the Caltrans Traffic Census website.

5.3 Existing Intersection Levels of Service

Table 5–3 summarizes the Existing intersections level of service. As seen in *Table 5–3*, all signalized intersections are calculated to operate at LOS C or better and the minor street worst case movements at all unsignalized intersections are calculated to operate at LOS C or better, except the following All-Way Stop Controlled (AWSC) intersection which is calculated to currently operate at LOS E:

- Dogwood Road / SR 86, LOS E during the PM peak hour

Appendix B contains the Existing intersection analysis worksheets.

5.4 Existing Segment Levels of Service

Table 5–4 summarizes the Existing segment level of service. As seen in *Table 5–4*, all segments are calculated to operate at LOS C or better.

TABLE 5–3
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay [a]	LOS [b]
1. Dogwood Rd / Correll Rd	Signal	AM	21.8	C
		PM	19.9	B
2. Dogwood Rd / SR-86	AWSC [c]	AM	13.2	B
		PM	**36.9**	**E**
3. Pitzer Rd / E. McCabe Rd	Signal	AM	17.9	B
		PM	16.5	B
4. Pitzer Rd / Correll Rd	Signal	AM	7.0	A
		PM	6.9	A
5. SR-111 / E. McCabe Rd	Signal	AM	8.2	A
		PM	17.6	B
6. SR-111 / E. Heber Rd	Signal	AM	13.3	B
		PM	27.5	C
7. SR-86 / Pitzer Rd	TWSC [d]	AM	10.6	B
		PM	10.8	B

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. AWSC – All-Way-Stop-Controlled intersection. Overall delay and LOS reported.
d. TWSC – Two-Way Stop Controlled intersection. Minor street worst-case delay and LOS are reported.

General ***Note***:
Bold indicates LOS E or worse operation

SIGNALIZED		UNSIGNALIZED	
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 5–4
EXISTING SEGMENT OPERATIONS

Intersection	Functional Classification [a]	LOS E Capacity [b]	Volume	LOS [c]	V/C [d]
Dogwood Road					
McCabe Rd to Correll Rd	3-Lane Collector	25,650	15,850	B	0.618
Correll Rd to Heber Rd	3-Lane Collector	25,650	10,110	A	0.394
E. McCabe Rd					
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	1,520	A	0.094
Pitzer Rd to SR 111	4-Lane Collector	34,200	5,280	A	0.154
Pitzer Road					
McCabe Rd to Correll Rd	2-Lane Minor Collector	16,200	990	A	0.061
SR 86					
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	5,900	C	0.364
Pitzer Rd to SR 111	2-Lane Minor Collector	16,200	5,500	C	0.340

Footnotes:

a. The roadway classification at which the road currently operates.
b. The capacity of the roadway at LOS E.
c. Level of Service.
d. Volume/Capacity ratio.

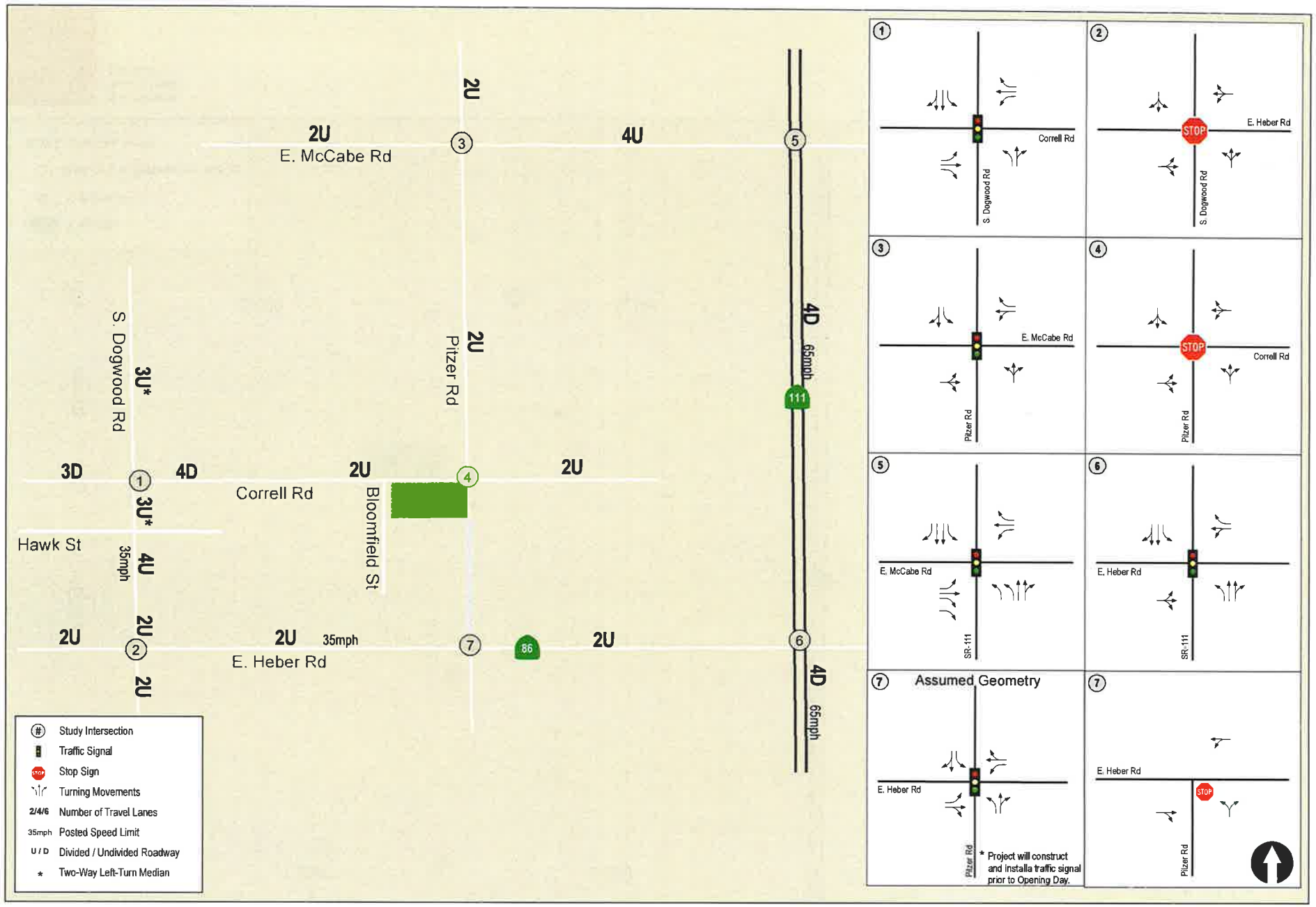

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Figure 5-1

Existing Conditions Diagram

HEBER MEADOWS

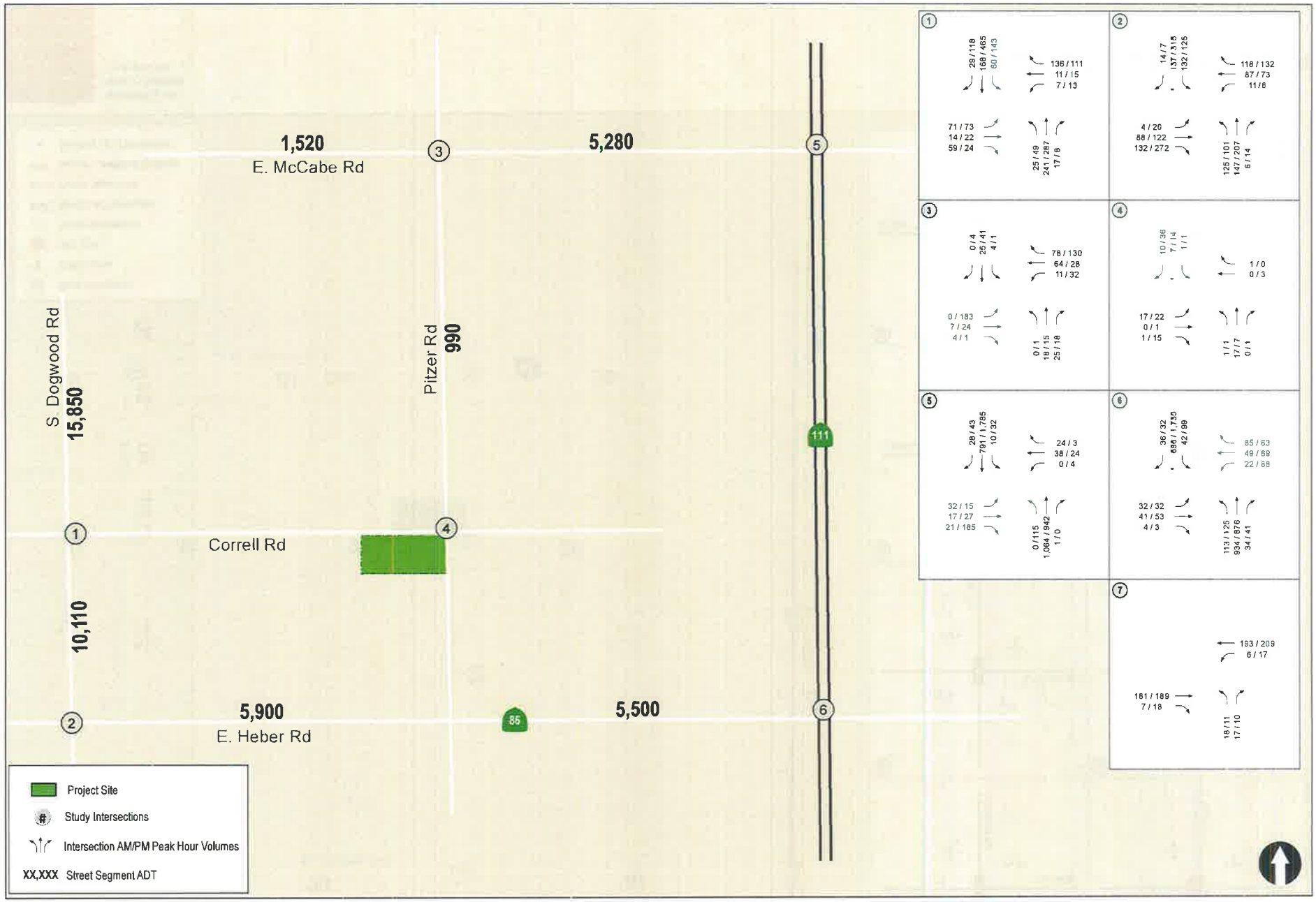

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Figure 5-2

Existing Traffic Volumes

HEBER MEADOWS

6.0 PROJECT TRAFFIC

6.1 Trip Generation

The trip rates for Land Use 220, Multifamily Housing (Low Rise) provided in the 10th Edition of the *Trip Generation* manual published by the Institute of Transportation Engineers (ITE) were used to estimate the trips generated by the proposed land use.

Table 6-1 summarizes the project trip generation. As seen in *Table 6-1*, the Project is calculated to generate a total of 1,742 daily trips with 107 AM peak hour trips (28 inbound and 79 outbound) and 135 PM peak hour trips (82 inbound 53 outbound.

6.2 Trip Distribution and Assignment

Project trip distribution was developed based on existing traffic patterns, location of schools, work and shopping opportunities and the regional roadway network. ***Figure 6-1*** depicts the Project trip distribution.

Project traffic was distributed and assigned based on the distribution percentages on *Figure 6-1*. ***Figure 6-2*** depicts the Project trip distribution, while ***Figure 6-3*** depicts the Existing + Project traffic volumes.

TABLE 6-1
TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Apartments	320 DU	[b]	1,742	[c]	26 : 74	28	79	107	[d]	61 : 39	82	53	135

Footnotes:

a. Rates are based on the trip rates provided in the *Trip Generation* Manual, Institute of Transportation Engineers (ITE), 10th Edition.

b. The daily trip rates for Land Use 220, Multifamily Housing (Low Rise) was used to calculate the trip generation for the proposed apartment units. Daily trip rate: T = 7.56(X) - 40.86, T is the number of trips and X is the number of units.

c. The AM peak hour trip rates for Land Use 220, Multifamily Housing (low Rise) was used to calculate the trip generation for the proposed apartment units. AM peak hour trip rate: Ln(T) = 0.95 Ln(X) - 0.51.

d. The PM peak hour trip rates for Land Use 220, Multifamily Housing (low Rise) was used to calculate the trip generation for the proposed apartment units. PM peak hour trip rate: Ln(T) = 0.89 Ln(X) - 0.02

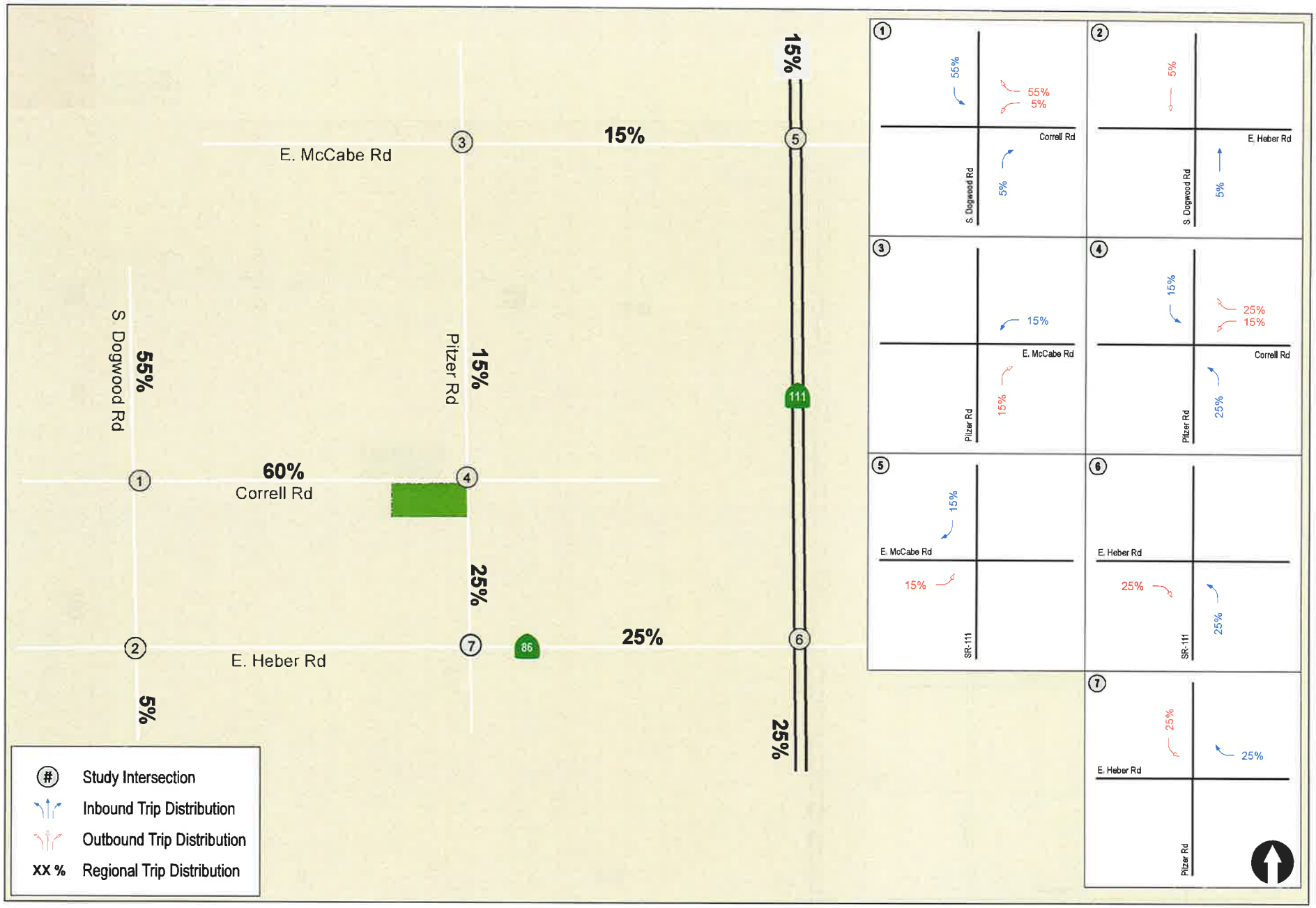

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Figure 6-1
Project Trip Distribution

HEBER MEADOWS

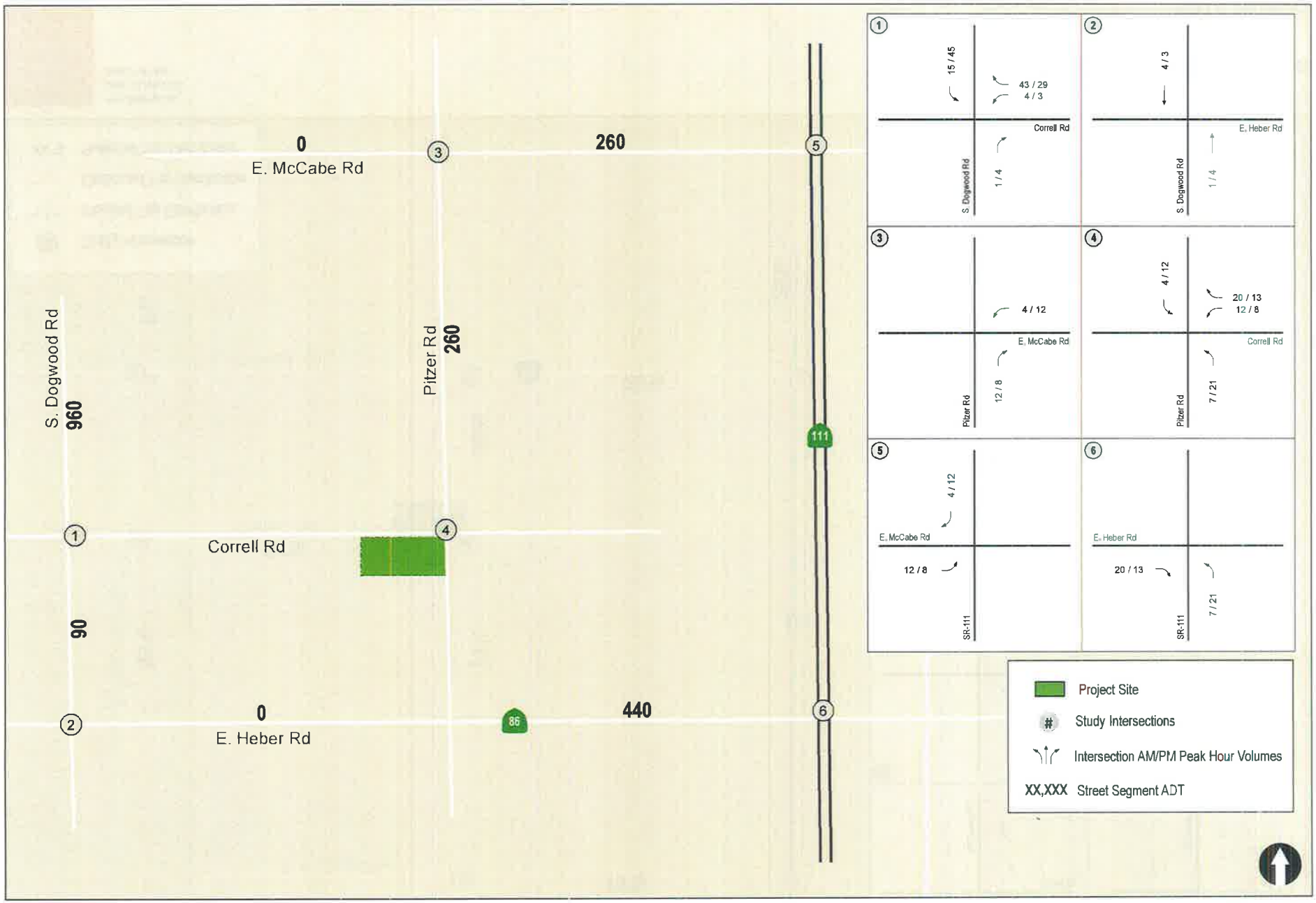

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Figure 5-2

Project Traffic Volumes

HEBER MEADOWS

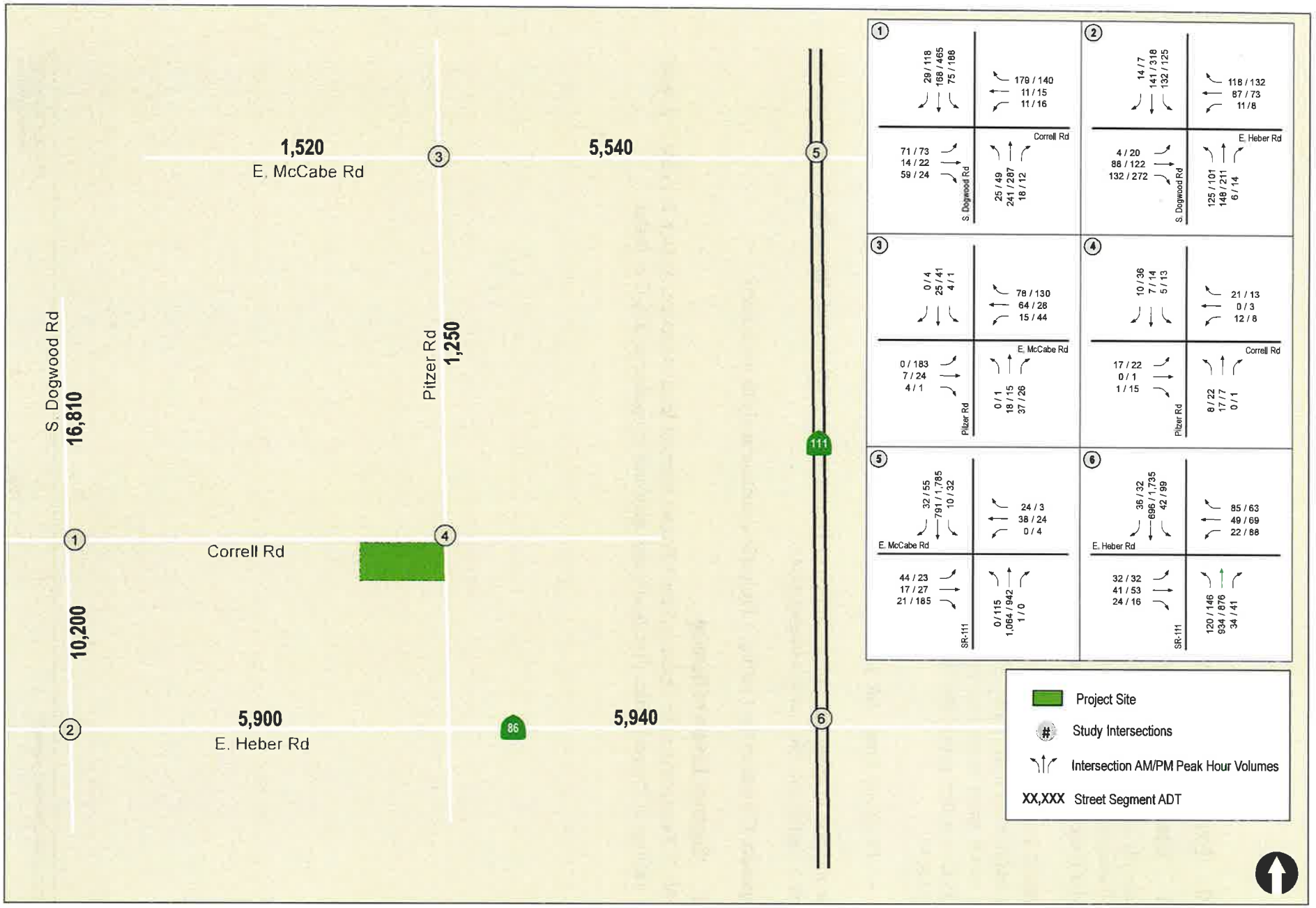

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Figure 5-3

Existing + Project Traffic Volumes

HEBER MEADOWS

7.0 EXISTING + PROJECT ANALYSIS

7.1 Intersection Level of Service

Currently, the Pitzer Road / SR 86 intersection is a three-leg intersection with no north leg. The Project will construct the north leg of Pitzer Road to complete this four-leg intersection. In this report, all "with Project" analysis assumes that the Pitzer Road / SR 86 intersection is signalized.

Table 7–1 summarizes the Existing + Project intersections level of service. As seen in *Table 7–1*, with the addition of Project traffic, all signalized intersections are calculated to operate at LOS C or better and the minor street worst case movements at all unsignalized intersections are calculated to operate at LOS C or better, except the following AWSC intersection which is calculated to continue to operate at LOS E:

- Dogwood Road / SR 86, LOS E during the PM peak hour

The increase in delay due to the addition of Project traffic is 0.9 seconds hence the Project does not have a significant effect at this intersection.

Appendix C contains the Existing + Project intersection analysis worksheets.

7.2 Segment Levels of Service

Table 7–2 summarizes the Opening Year + Project segment level of service. As seen in *Table 7–2*, with the addition of Project traffic, all segments are calculated to operate at LOS C or better.

TABLE 7–1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Substantial Effect?
			Delay [a]	LOS [b]	Delay	LOS	
1. Dogwood Rd / Correll Rd	Signal	AM	21.8	C	23.1	C	No
		PM	19.9	B	21.8	C	No
2. Dogwood Rd / SR-86	AWSC [c]	AM	13.2	B	13.3	B	No
		PM	36.9	E	37.8	E	No
3. Pitzer Rd / E. McCabe Rd	Signal	AM	17.9	B	21.2	C	No
		PM	16.5	B	18.6	B	No
4. Pitzer Rd / Correll Rd	Signal	AM	7.0	A	7.1	A	No
		PM	6.9	A	7.1	A	No
5. SR-111 / E. McCabe Rd	Signal	AM	8.2	A	8.7	A	No
		PM	17.6	B	17.7	B	No
6. SR-111 / E. Heber Rd	Signal	AM	13.3	B	14.0	B	No
		PM	27.5	C	31.3	C	No
7. SR-86 / Pitzer Rd	TWSC [d]	AM	10.6	B	23.3 [e]	C	No
			10.8	B	22.7 [e]	C	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street worst-case delay and LOS are reported.
d. Increase in delay due to Project traffic.
e. Intersection is analyzed as a signalized intersection in the Existing + Project scenario.

SIGNALIZED		UNSIGNALIZED	
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 7–2
EXISTING + PROJECT SEGMENT OPERATIONS

Intersection	Functional Classification [a]	LOS E Capacity [b]	Existing			Existing + Project			Δ Delay [e]	Substantial Effect?
			Volume	LOS [c]	V/C [d]	Volume	LOS	V/C		
Dogwood Road										
McCabe Rd to Correll Rd	3-Lane Collector	25,650	15,850	B	0.618	16,810	B	0.655	0.037	None
Correll Rd to Heber Rd	3-Lane Collector	25,650	10,110	A	0.394	10,200	A	0.398	0.004	None
E. McCabe Rd										
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	1,520	A	0.094	1,520	A	0.094	0.000	None
Pitzer Rd to SR 111	4-Lane Collector	34,200	5,280	A	0.154	5,540	A	0.162	0.008	None
Pitzer Road										
McCabe Rd to Correll Rd	2-Lane Minor Collector	16,200	990	A	0.061	1,250	A	0.077	0.016	None
SR 86										
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	5,900	C	0.364	5,900	C	0.364	0.000	None
Pitzer Rd to SR 111	2-Lane Minor Collector	16,200	5,500	C	0.340	5,940	C	0.367	0.027	None

Footnotes:

a. The roadway classification at which the road currently operates.
b. The capacity of the roadway at LOS E.
c. Level of Service.
d. Volume/Capacity ratio.
e. Increase in V/C ratio due to the Project

8.0 CUMULATIVE TRAFFIC VOLUMES

Research was conducted at Imperial County to identify any known Cumulative projects in the Project vicinity. No projects are currently planned in the near-term in the Project vicinity. Therefore, in order to account for cumulative traffic, a growth factor of 2% per year for 5 years was applied to the existing volumes to obtain cumulative traffic volumes. These volumes were added to the Existing + Project traffic volumes to obtain the Existing + Project + Cumulative project volumes.

Figure 8-1 depicts the Cumulative Project traffic volumes and ***Figure 8-2*** depicts the Existing + Project + Cumulative Project traffic volumes.

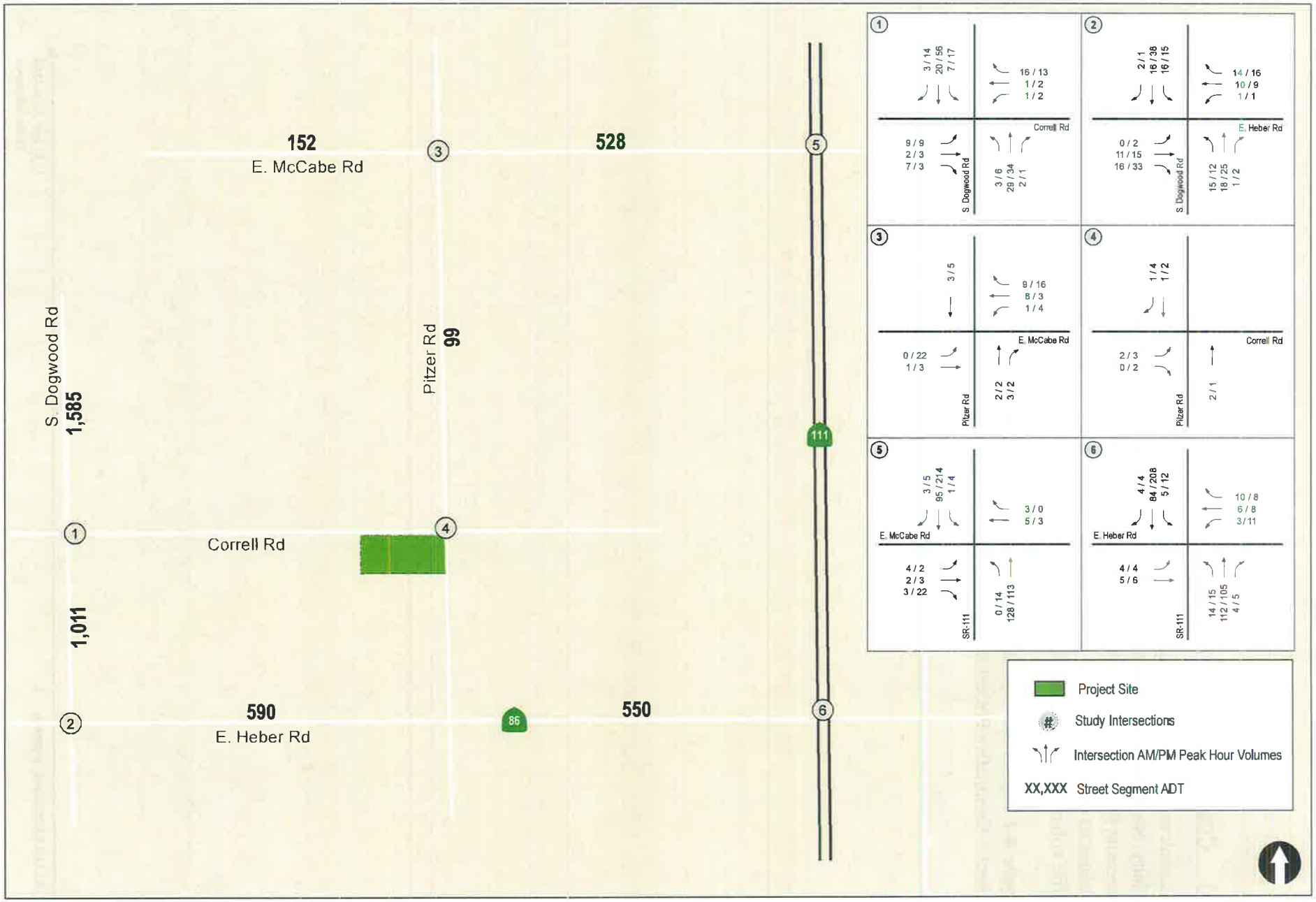

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Figure 7-1

Cumulative Projects Traffic Volumes

HEBER MEADOWS

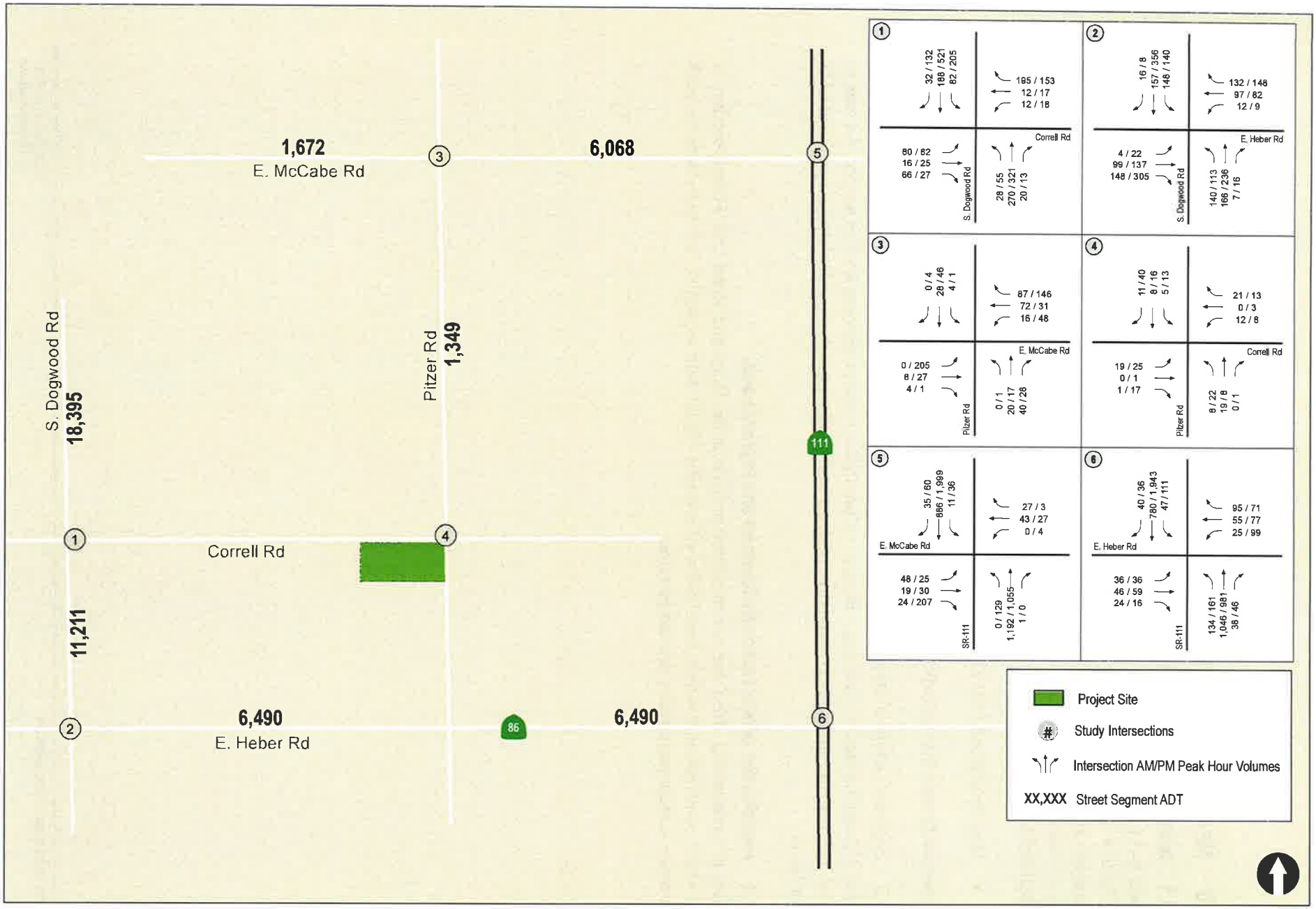

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Figure 7-2

Existing + Project + Cumulative Projects Traffic Volumes

9.0 NEAR-TERM ANALYSIS

9.1.1 *Intersection Level of Service*

Table 9–1 summarizes the Existing + Project + Cumulative projects intersection level of service. As seen in *Table 9–1*, with the addition of Cumulative projects traffic, all signalized intersections are calculated to operate at LOS D or better and the minor street worst case movements at all unsignalized intersections are calculated to operate at LOS C or better, except the following AWSC intersection which is calculated to operate at LOS E:

- Dogwood Road / SR 86, LOS E during the PM peak hour

Appendix D contains the Existing + Project + Cumulative projects intersection analysis worksheets.

9.1.2 *Segment Levels of Service*

Table 9–2 summarizes the Existing + Project + Cumulative projects segment level of service. As seen in *Table 9–2*, with the addition of Cumulative projects traffic, all segments are calculated to operate at LOS C or better.

9.1.3 *Identification of Intersection Deficiencies and Improvements.*

There is a substantial effect due to cumulative projects at the Dogwood Road / SR 86 intersection. A fair share contribution towards installation of a traffic signal with exclusive left-turn lanes on each approach is recommended at this intersection.

TABLE 9–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing + Project		Existing + Project + Cumulative Projects		Substantial Effect?
			Delay [a]	LOS [b]	Delay	LOS	
1. Dogwood Rd / Correll Rd	Signal	AM	23.1	C	24.0	C	No
		PM	21.8	C	22.8	C	No
2. Dogwood Rd / SR-86	AWSC [c]	AM	13.3	B	16.2	C	No
		PM	**37.8**	**E**	**65.4**	**F**	**Yes**
3. Pitzer Rd / E. McCabe Rd	Signal	AM	21.2	C	21.6	C	No
		PM	18.6	B	18.7	B	No
4. Pitzer Rd / Correll Rd	Signal	AM	7.1	A	7.1	A	No
		PM	7.1	A	7.1	A	No
5. SR-111 / E. McCabe Rd	Signal	AM	8.7	A	9.3	A	No
		PM	17.7	B	22.7	C	No
6. SR-111 / E. Heber Rd	Signal	AM	14.0	B	15.0	B	No
		PM	31.3	C	43.3	D	No
7. SR-86 / Pitzer Rd	TWSC [d]	AM	12.4	B	23.4 [e]	C	No
			13.6	B	22.8 [e]	C	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street worst-case delay and LOS are reported.
d. Increase in delay due to Project traffic.
e. Intersection is analyzed as a signalized intersection in the Existing + Project + Cumulative Projects scenario.

SIGNALIZED		UNSIGNALIZED	
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Note:

Bold indicates substantial effect.

TABLE 9–2
NEAR-TERM SEGMENT OPERATIONS

Intersection	Functional Classification [a]	LOS E Capacity [b]	Existing + Project			Existing + Project + Cumulative Projects			Substantial Effect?
			Volume	LOS [c]	V/C [d]	Volume	LOS	V/C	
Dogwood Road									
McCabe Rd to Correll Rd	3-Lane Collector	25,650	16,810	B	0.655	18,395	C	0.717	No
Correll Rd to Heber Rd	3-Lane Collector	25,650	10,200	A	0.398	11,211	B	0.437	No
E. McCabe Rd									
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	1,520	A	0.094	1,672	A	0.103	No
Pitzer Rd to SR 111	4-Lane Collector	34,200	5,540	A	0.162	6,068	A	0.177	No
Pitzer Road									
McCabe Rd to Correll Rd	2-Lane Minor Collector	16,200	1,250	A	0.077	1,349	A	0.083	No
SR 86									
Dogwood Rd to Pitzer Rd	2-Lane Minor Collector	16,200	5,900	C	0.364	6,490	C	0.401	No
Pitzer Rd to SR 111	2-Lane Minor Collector	16,200	5,940	C	0.367	6,490	C	0.401	No

Footnotes:

a. The roadway classification at which the road currently operates.
b. The capacity of the roadway at LOS E.
c. Level of Service.
d. Volume/Capacity ratio.
e. Increase in V/C ratio due to the Project

10.0 SITE ACCESS ANALYSIS

Project access is planned on the Correll Road, Bloomfield Street and Pitzer Road, as shown on ***Figure 10-1*** and is described below:

- The main access driveway will be provided via a new cul-de-sac, Willowbrook Place, to Correll Road. Internal roads from Parcels 1 through 4 will be able to access Willowbrook Place.
- Access to Parcel 1 is proposed on Bloomfield Street and to Willowbrook Place.
- Access to Parcel 2 is proposed on Bloomfield Street and to Willowbrook Place.
- Access to Parcel 3 is proposed on Correll Road and to Willowbrook Place.
- Access to Parcel 4 is proposed to Willowbrook Place and a shared emergency access only through Parcel 3 to Correll Road.
- Two access driveways on Pitzer Road are proposed for Parcel 5.

All access driveways to the parcels will be gated and for the use of emergency vehicles and trash trucks.

Figure 10-1 depicts the recommended intersection geometry at all access points.

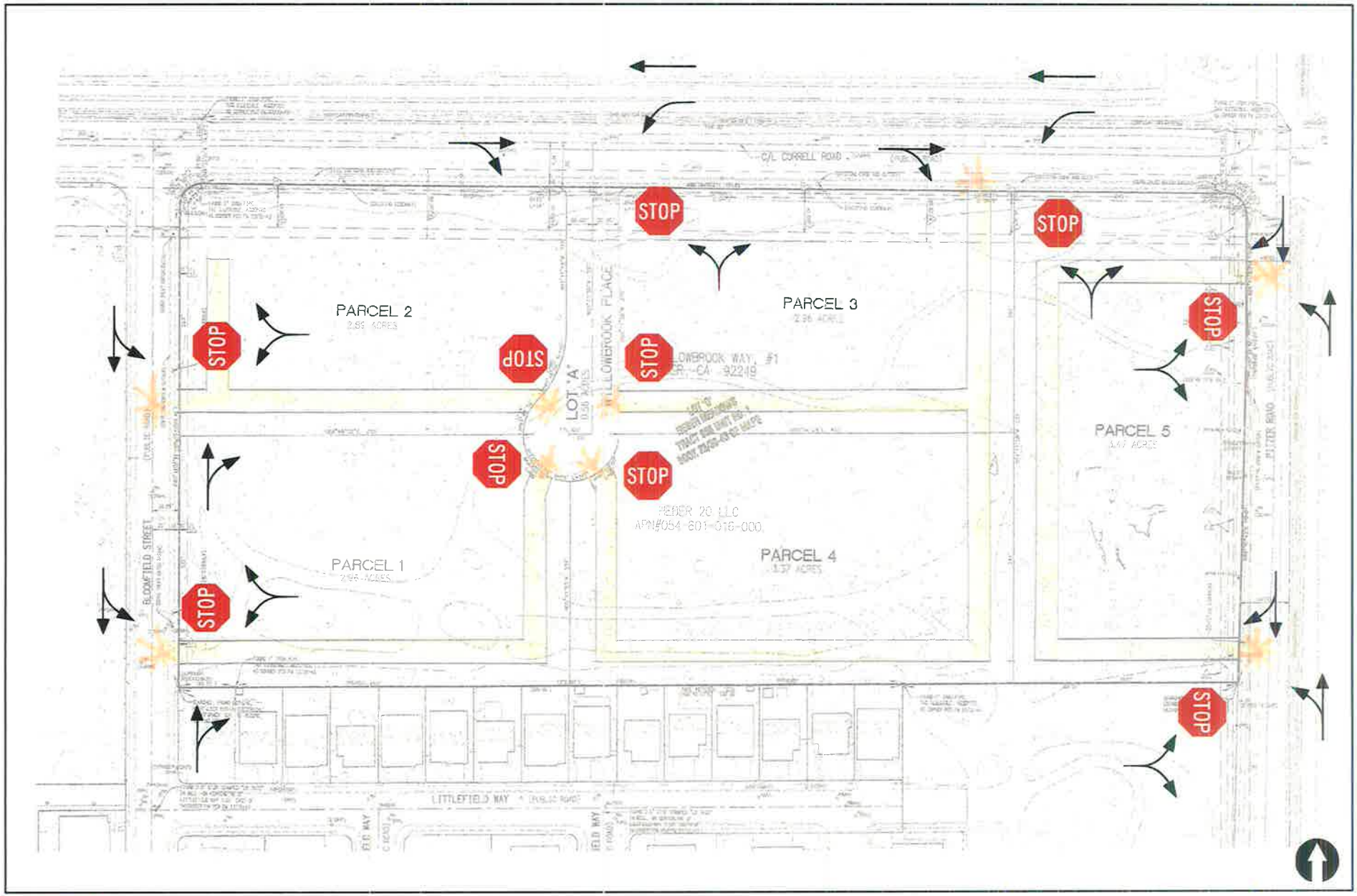

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Figure 10-1

Recommended Project Access Geometry

HEBER MEADOWS

11.0 ACTIVE TRANSPORTATION CONDITIONS

11.1 Pedestrian Conditions

Sidewalks are provided on Dogwood Road, McCabe Road, Pitzer Road and Correll Road within the study area, as shown on ***Figure 11-1***.

11.2 Bicycle Conditions

11.2.1 *Existing Conditions*

On Dogwood Road, there is an existing Class II bike lane from Black Hills Road to State Highway 86 on the west side of Dogwood Road and from State Highway 86 to Correll Road on the east side of Dogwood Road.

Bike facilities do not exist on McCabe Road, Pitzer Road, Correll Road and Heber Road.

11.2.2 *Future Improvements*

The following future improvements are recommended in the *Imperial County Bicycle Master Plan Update*, December 2011:

- A 5.1-mile Class II Bike Lane on Dogwood Road between McCabe Road and SR 98.
- A 12.1-mile Class II Bike Lane on McCabe Road between Brockman Road and La Brucherie Road.

Bike facilities are not planned on Pitzer Road, Correll Road and Heber Road.

11.3 Transit Conditions

11.3.1 *Existing Conditions*

Transit service within Imperial County is provided by Imperial Valley Transit. Bus routes in the vicinity of the project site include routes 1S and 1N. Brief descriptions of the routes are provided below:

Route 1N

Route 1N runs from Calexico to El Centro. This route begins at Hacienda Drive & Ollie Avenue in Calexico and ends at State Street & 7th Street in El Centro. There are 27 stops along this route. The stops closest to the project site are Heber Road & Nina Road, Heber Road & Parkyns Avenue, and Dogwood Road & Correll Road. Buses run with 1½ to 2-hour headways.

Route 1S

Route 1Sruns from El Centro to Calexico. This route begins at State Street & 7th Street in El Centro and ends at Hacienda Drive & Ollie Avenue. There are 13 stops along this route. The stops closest to the project site are Heber Road & Clifford Road, Heber Road & Parkyns Avenue, and Dogwood Road & Correll Road. Buses run with 1-hour headways.

11.3.2 *Future Improvements*

The *Fiscal Year 2010-11 Short Range Transit Plan*, March 9, 2012, recommends improved headways of 60 minutes from the existing 1½ to 2-hour headways. This plan also includes improved Saturday and Sunday services.

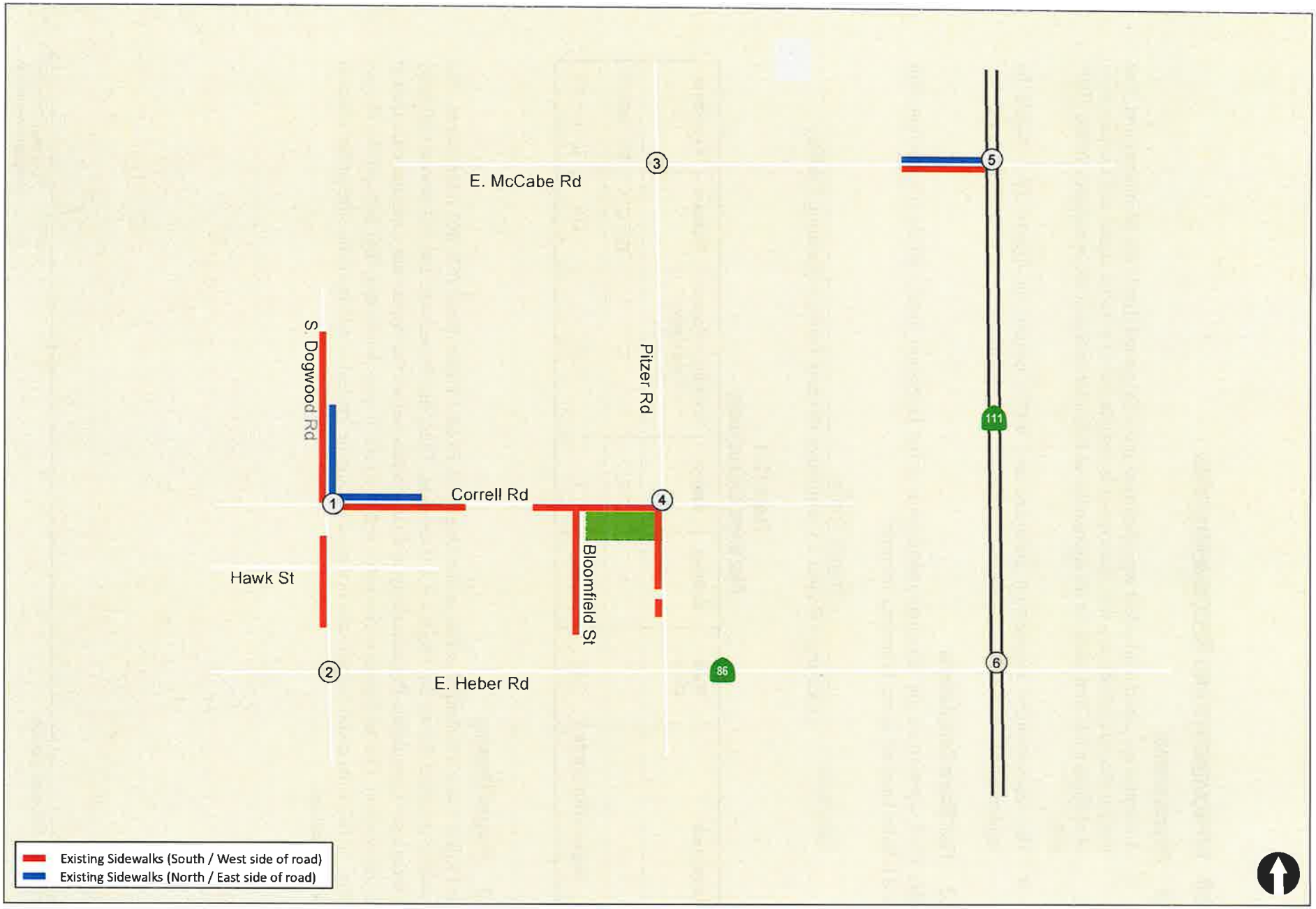

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Figure 11-1

Existing Sidewalks

HEBER MEADOWS

12.0 IMPROVEMENTS AND RECOMMENDATIONS

12.1 Improvements

- A cumulative substantial effect was identified at the Dogwood Road / SR 86 intersection. The Project should contribute a fair share towards installation of a traffic signal and the provision of exclusive left-turn lanes on all approaches at this intersection at the occupancy of the 192nd unit.
- The recommended intersection geometry and traffic control on *Figure 10-1* should be implemented.

12.2 Fair Share Calculations

Table 12–1 summarizes the fair share calculations at the Dogwood Road / SR 86 intersection. Fair share is calculated using the following formula:

$$\text{Fair Share} = \frac{\text{Project Traffic}}{(\text{Existing} + \text{Project} + \text{Cumulative Projects Traffic}) - (\text{Existing Traffic})}$$

TABLE 12–1
FAIR SHARE CALCULATIONS

Intersection	Peak Hour	Existing	Project	Existing + Project + Cumulative Projects	Increase	Fair Share %
		A	B	C	D = C-A	E = (B/D)%
2. Dogwood Rd / SR 86	AM	1,396	7	1,572	176	7/176 = **4%**

12.3 Project Phasing

The Project has a substantial effect at the Dogwood Road / Heber Road (SR 86) intersection. The allowable increase due to the Project is 2.0 seconds. Thus, the Project can add 2.0 seconds of delay the Existing + Cumulative Projects delay of 63.0 seconds before the Project has a substantial effect at this intersection. On the Synchro computerized analysis, it was determined that 60% of the Project traffic, or 192 units could be built and occupied before the Project would have the substantial effect at this intersection.

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engineers

TECHNICAL APPENDICES
HEBER MEADOWS

Imperial County, California
November 19, 2020

LLG Ref. 3-20-3289

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APPENDICES

APPENDIX

A. Intersection Manual and Segment Count Sheets

B. Intersection Analysis Worksheets – Existing

C. Intersection Analysis Worksheets – Existing + Project

D. Intersection Analysis Worksheets – Existing + Project + Cumulative Projects

APPENDIX A

INTERSECTION MANUAL AND SEGMENT COUNT SHEETS

Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#01	File Name:	ITM-20-034-01
Intersection:	Dogwood Road & Correll Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Dogwood Road Southbound			Correll Road Westbound			Dogwood Road Northbound			Correll Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	4	15	2	1	0	18	5	30	1	9	0	3	88
7:15	10	27	7	1	1	14	1	47	0	15	2	9	134
7:30	10	25	2	0	1	24	8	55	5	14	3	7	154
7:45	9	33	7	2	2	31	1	50	4	17	2	7	165
8:00	14	30	6	1	2	17	5	35	0	9	2	14	135
8:15	10	32	6	2	3	25	4	32	3	11	3	14	145
8:30	7	27	8	4	0	14	4	48	2	11	3	9	137
8:45	2	27	6	6	0	20	4	49	4	6	1	4	129
Total	66	216	44	17	9	163	32	346	19	92	16	67	1087
Approach%	20.2	66.3	13.5	9.0	4.8	86.2	8.1	87.2	4.8	52.6	9.1	38.3	
Total%	6.1	19.9	4.0	1.6	0.8	15.0	2.9	31.8	1.7	8.5	1.5	6.2	

AM Intersection Peak Hour: 07:30 to 08:30

Volume	43	120	21	5	8	97	18	172	12	51	10	42	599
Approach%	23.4	65.2	11.4	4.5	7.3	88.2	8.9	85.1	5.9	49.5	9.7	40.8	
Total%	7.2	20.0	3.5	0.8	1.3	16.2	3.0	28.7	2.0	8.5	1.7	7.0	
PHF			0.92			0.79			0.74			0.92	0.00

PM	Dogwood Road Southbound			Correll Road Westbound			Dogwood Road Northbound			Correll Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	15	80	27	0	4	22	6	49	1	6	2	4	216
16:15	26	82	21	1	1	18	8	62	0	8	1	8	236
16:30	31	77	15	1	4	18	4	45	4	8	3	6	216
16:45	24	78	18	3	2	11	13	54	1	14	4	6	228
17:00	27	82	20	3	3	19	8	59	2	12	2	1	238
17:15	24	89	21	2	1	22	9	38	0	10	5	5	226
17:30	27	83	25	1	5	27	5	54	3	16	5	5	256
17:45	19	68	28	0	7	20	6	42	1	9	1	6	207
Total	193	639	175	11	27	157	59	403	12	83	23	41	1823
Approach%	19.2	63.5	17.4	5.6	13.8	80.5	12.4	85.0	2.5	56.5	15.6	27.9	
Total%	10.6	35.1	9.6	0.6	1.5	8.6	3.2	22.1	0.7	4.6	1.3	2.2	

PM Intersection Peak Hour: 16:45 to 17:45

Volume	102	332	84	9	11	79	35	205	6	52	16	17	948
Approach%	19.7	64.1	16.2	9.1	11.1	79.8	14.2	83.3	2.4	61.2	18.8	20.0	
Total%	10.8	35.0	8.9	0.9	1.2	8.3	3.7	21.6	0.6	5.5	1.7	1.8	
PHF			0.96			0.75			0.89			0.82	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

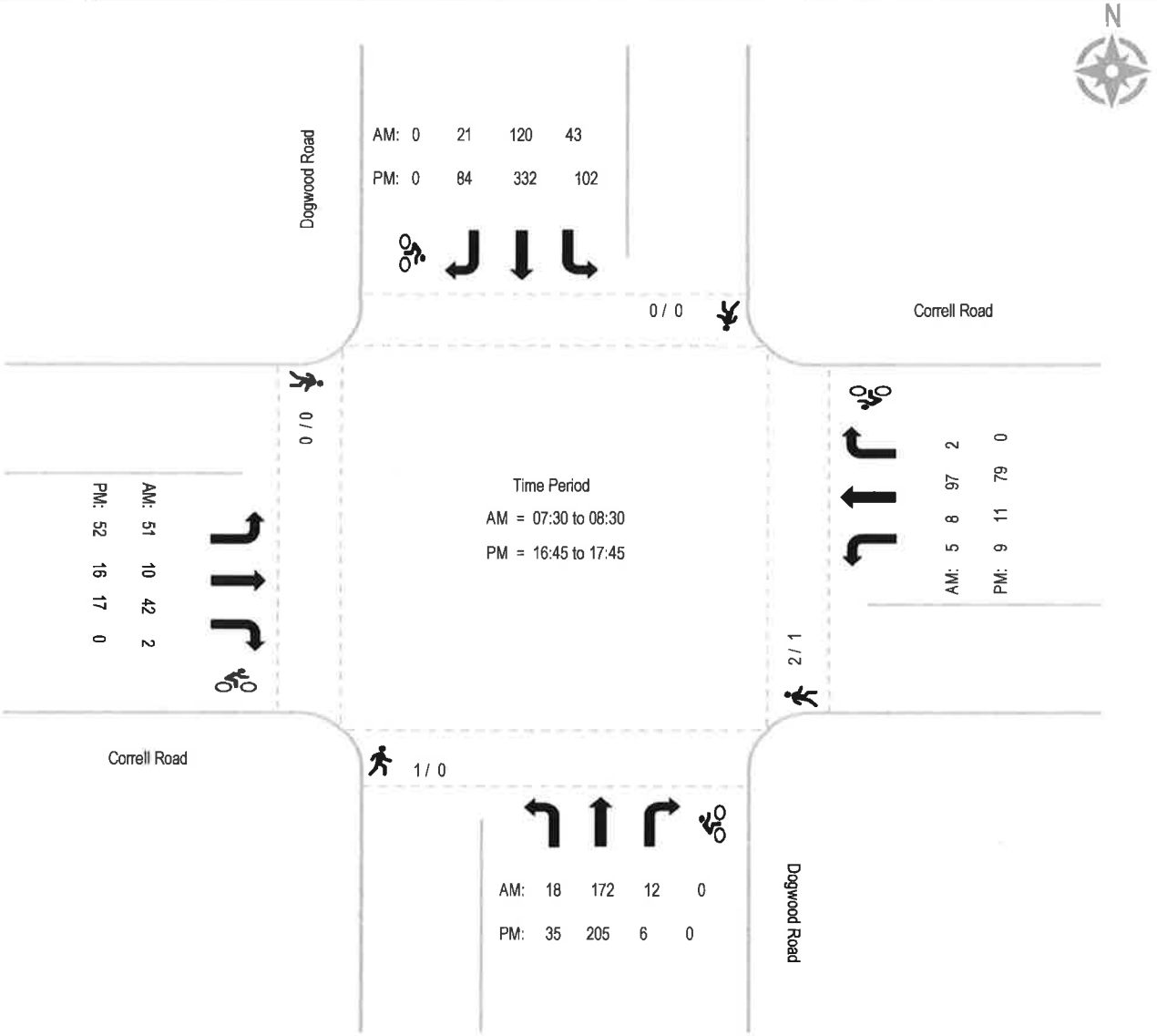
Location:	#01	File Name:	ITM-20-034-01
Intersection:	Dogwood Road & Correll Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Dogwood Road Southbound				Correll Road Westbound				Dogwood Road Northbound				Correll Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	3
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
8:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				2				1				0				3	
Bike Total		0	0	0		0	1	1		0	0	0		0	0	2		4

PM	Dogwood Road Southbound				Correll Road Westbound				Dogwood Road Northbound				Correll Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				1				0				0				1	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location: #01	File Name:	ITM-20-034-01
	Intersection: Dogwood Road & Correll Road	Project:	LLG Ref. 3-20-3289
	Date of Count: Thursday, September 24, 2020		Heber Meadows - Imperial



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#02	File Name:	ITM-20-034-02
Intersection:	Dogwood Road & SR-86	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Dogwood Road Southbound			SR-86 Westbound			Dogwood Road Northbound			SR-86 Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	21	12	1	0	9	18	23	23	1	0	11	9	128
7:15	23	29	1	0	16	11	29	27	0	0	15	10	161
7:30	25	15	6	2	20	29	29	34	0	1	14	19	194
7:45	20	28	2	3	19	20	27	37	3	1	19	23	202
8:00	20	29	1	3	11	16	16	19	1	0	18	22	156
8:15	29	26	1	0	12	19	17	15	0	1	12	30	162
8:30	18	23	4	1	15	22	15	20	2	1	23	23	167
8:45	21	15	1	0	20	28	28	21	0	2	15	16	167
Total	177	177	17	9	122	163	184	196	7	6	127	152	1337
Approach%	47.7	47.7	4.6	3.1	41.5	55.4	47.5	50.6	1.8	2.1	44.6	53.3	
Total%	13.2	13.2	1.3	0.7	9.1	12.2	13.8	14.7	0.5	0.4	9.5	11.4	

AM Intersection Peak Hour: **07:30 to 08:30**

Volume	94	98	10	8	62	84	89	105	4	3	63	94	714
Approach%	46.5	48.5	5.0	5.2	40.3	54.5	44.9	53.0	2.0	1.9	39.4	58.8	
Total%	13.2	13.7	1.4	1.1	8.7	11.8	12.5	14.7	0.6	0.4	8.8	13.2	
PHF			0.90			0.75			0.74			0.93	0.00

PM	Dogwood Road Southbound			SR-86 Westbound			Dogwood Road Northbound			SR-86 Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	24	43	0	4	19	13	27	36	2	2	31	34	235
16:15	27	50	2	2	9	28	13	40	3	2	22	40	238
16:30	31	60	1	2	15	18	20	36	2	3	21	43	252
16:45	18	53	2	1	15	30	21	33	4	6	19	42	244
17:00	23	56	1	2	11	20	15	44	3	5	23	49	252
17:15	17	56	1	1	11	26	17	35	1	0	24	60	249
17:30	20	48	1	0	11	14	17	49	2	2	17	47	228
17:45	20	46	2	3	11	22	19	29	1	4	20	33	210
Total	180	412	10	15	102	171	149	302	18	24	177	348	1908
Approach%	29.9	68.4	1.7	5.2	35.4	59.4	31.8	64.4	3.8	4.4	32.2	63.4	
Total%	9.4	21.6	0.5	0.8	5.3	9.0	7.8	15.8	0.9	1.3	9.3	18.2	

PM Intersection Peak Hour: **16:30 to 17:30**

Volume	89	225	5	6	52	94	73	148	10	14	87	194	997
Approach%	27.9	70.5	1.6	3.9	34.2	61.8	31.6	64.1	4.3	4.7	29.5	65.8	
Total%	8.9	22.6	0.5	0.6	5.2	9.4	7.3	14.8	1.0	1.4	8.7	19.5	
PHF			0.87			0.83			0.93			0.88	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

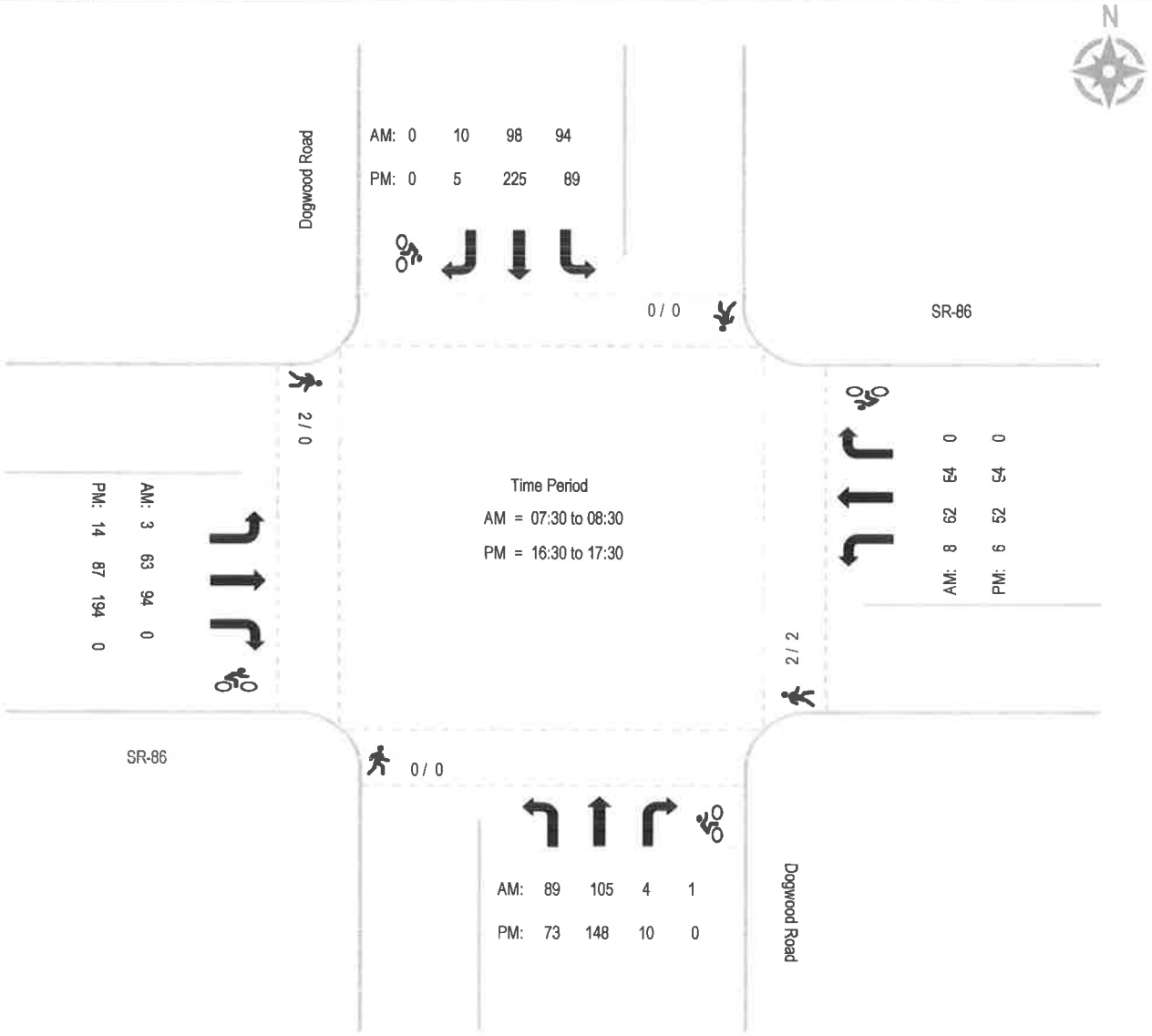
LINSCOTT LAW & GREENSPAN engineers	Location:	#02	File Name:	ITM-20-034-02
	Intersection:	Dogwood Road & SR-86	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Dogwood Road Southbound				SR-86 Westbound				Dogwood Road Northbound				SR-86 Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0
Ped Total	0				2				0				2				4	
Bike Total		0	0	0		0	0	0		1	0	0		0	0	0		1

PM	Dogwood Road Southbound				SR-86 Westbound				Dogwood Road Northbound				SR-86 Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				2				0				0				2	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#02	File Name:	ITM-20-034-02
	Intersection:	Dogwood Road & SR-86	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial



Report Generated by Bearcat Enterprises LLC, DBA "Count Data" | 619-987-5136 |

Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#03	File Name:	ITM-20-034-03
Intersection:	Pitzer Road & E. McCabe Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Pitzer Road Southbound			E. McCabe Road Westbound			Pitzer Road Northbound			E. McCabe Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	0	13	0	0	6	5	0	3	1	0	3	0	31
7:15	0	8	0	3	9	9	0	1	3	0	0	0	33
7:30	1	5	0	2	13	11	0	3	5	0	0	0	40
7:45	1	2	0	3	17	20	0	6	3	0	2	0	54
8:00	1	4	0	1	5	17	0	3	6	0	1	2	40
8:15	0	7	0	2	11	8	0	1	4	0	2	1	36
8:30	0	5	0	1	3	8	0	2	5	0	0	0	24
8:45	1	2	0	3	8	13	0	0	2	0	0	0	29
Total	4	46	0	15	72	91	0	19	29	0	8	3	287
Approach%	8.0	92.0	-	8.4	40.4	51.1	-	39.6	60.4	-	72.7	27.3	
Total%	1.4	16.0	-	5.2	25.1	31.7	-	6.6	10.1	-	2.8	1.0	
AM Intersection Peak Hour:	**07:30 to 08:30**												
Volume	3	18	-	8	46	56	-	13	18	-	5	3	170
Approach%	14.3	85.7	-	7.3	41.8	50.9	-	41.9	58.1	-	62.5	37.5	
Total%	1.8	10.6	-	4.7	27.1	32.9	-	7.6	10.6	-	2.9	1.8	
PHF			0.75			0.69			0.86			0.67	0.00

PM	Pitzer Road Southbound			E. McCabe Road Westbound			Pitzer Road Northbound			E. McCabe Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	0	7	0	3	4	28	0	2	2	43	4	2	95
16:15	1	9	1	5	11	36	0	3	0	38	1	0	105
16:30	1	1	1	4	9	18	0	2	2	19	4	0	61
16:45	0	4	1	7	3	17	0	4	2	30	10	0	78
17:00	0	9	2	6	5	28	0	4	1	39	2	1	97
17:15	1	10	0	4	10	25	1	0	6	31	4	0	92
17:30	0	6	0	6	2	23	0	3	4	31	1	0	76
17:45	0	5	2	4	9	22	0	1	2	26	1	0	72
Total	3	51	7	39	53	197	1	19	19	257	27	3	676
Approach%	4.9	83.6	11.5	13.5	18.3	68.2	2.6	48.7	48.7	89.5	9.4	1.0	
Total%	0.4	7.5	1.0	5.8	7.8	29.1	0.1	2.8	2.8	38.0	4.0	0.4	
PM Intersection Peak Hour:	**16:45 to 17:45**												
Volume	1	29	3	23	20	93	1	11	13	131	17	1	343
Approach%	3.0	87.9	9.1	16.9	14.7	68.4	4.0	44.0	52.0	87.9	11.4	0.7	
Total%	0.3	8.5	0.9	6.7	5.8	27.1	0.3	3.2	3.8	38.2	5.0	0.3	
PHF			0.75			0.87			0.89			0.89	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

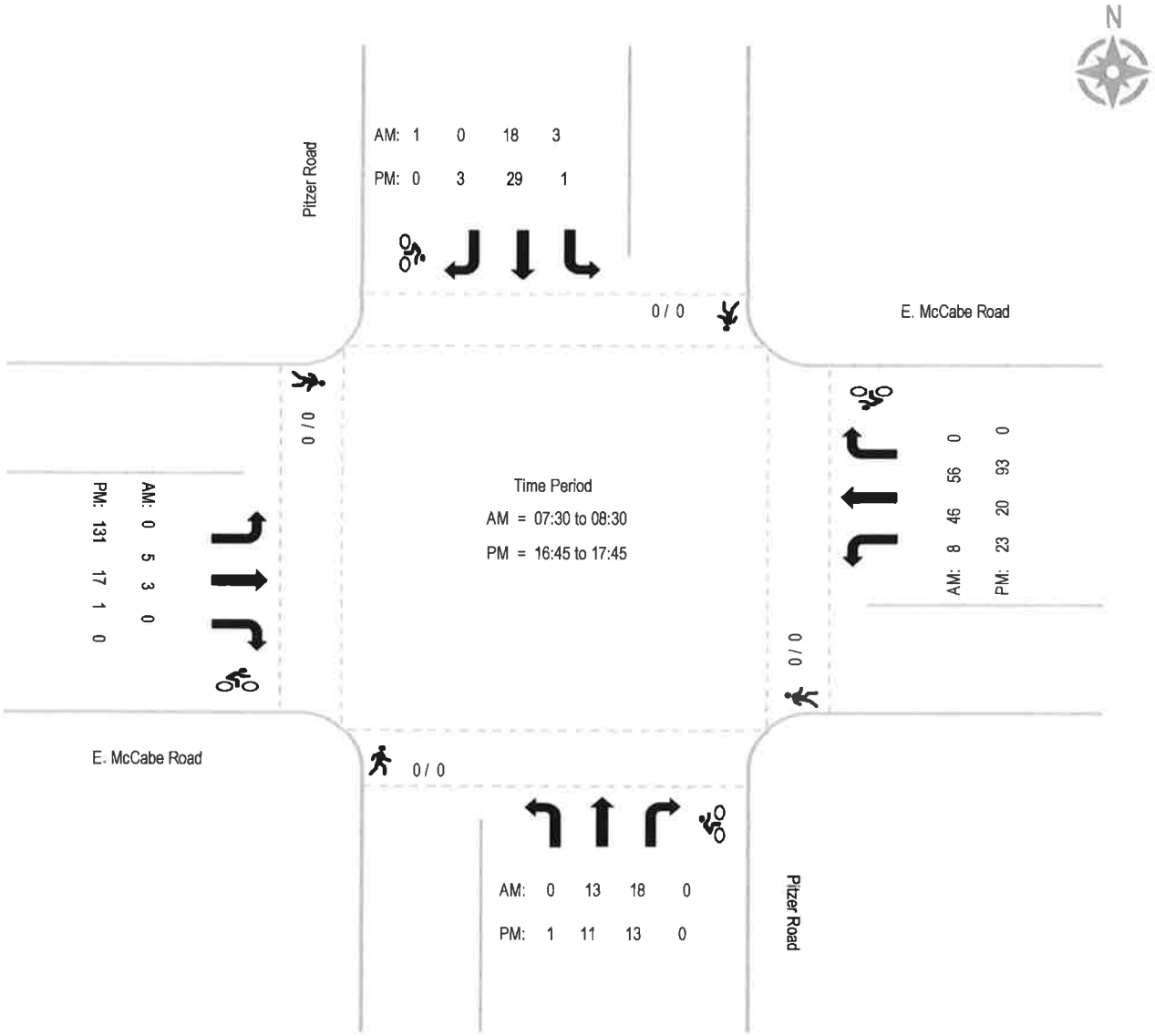
Location:	#03	File Name:	ITM-20-034-03
Intersection:	Pitzer Road & E. McCabe Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	Pitzer Road Southbound				E. McCabe Road Westbound				Pitzer Road Northbound				E. McCabe Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		1	0	0		0	0	0		0	0	0		0	0	0		1

PM	Pitzer Road Southbound				E. McCabe Road Westbound				Pitzer Road Northbound				E. McCabe Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#03	File Name:	ITM-20-034-03
	Intersection:	Pitzer Road & E. McCabe Road	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#04	File Name:	ITM-20-034-04
Intersection:	Pitzer Road & Correll Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Tuesday, October 01, 2020		Heber Meadows - Imperial

AM	Pitzer Road Southbound			Correll Road Westbound			Pitzer Road Northbound			Correll Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	0	1	0	0	0	0	0	4	0	5	0	0	10
7:15	0	0	1	0	0	1	0	2	0	0	0	0	4
7:30	0	0	3	0	0	0	1	1	0	3	0	0	8
7:45	0	0	0	0	0	0	1	5	0	2	0	0	8
8:00	0	3	3	0	0	0	0	2	0	4	0	0	12
8:15	1	0	2	0	0	0	0	1	0	4	0	1	9
8:30	0	2	2	0	0	1	0	4	0	2	0	0	11
8:45	0	0	2	0	0	0	0	0	0	3	0	0	5
Total	1	6	13	0	0	2	2	19	0	23	0	1	67
Approach%	5.0	30.0	65.0	-	-	100.0	9.5	90.5	-	95.8	-	4.2	
Total%	1.5	9.0	19.4	-	-	3.0	3.0	28.4	-	34.3	-	1.5	

AM Intersection Peak Hour: **07:45 to 08:45**

Volume	1	5	7	-	-	1	1	12	-	12	-	1	40
Approach%	7.7	38.5	53.8	-	-	100.0	7.7	92.3	-	92.3	-	7.7	
Total%	2.5	12.5	17.5	-	-	2.5	2.5	30.0	-	30.0	-	2.5	
PHF			0.54			0.25			0.54			0.65	0.00

PM	Pitzer Road Southbound			Correll Road Westbound			Pitzer Road Northbound			Correll Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	0	1	5	0	0	0	3	0	0	2	0	0	11
16:15	0	5	5	0	0	0	0	1	0	4	0	2	17
16:30	1	5	8	0	0	0	1	0	0	1	0	0	16
16:45	2	1	2	0	0	1	0	1	0	2	0	0	9
17:00	0	3	4	0	0	0	0	0	0	1	0	1	9
17:15	0	1	7	0	0	0	1	1	0	3	0	0	13
17:30	1	6	6	0	0	0	0	1	1	8	0	8	31
17:45	0	0	9	0	2	0	0	3	0	4	1	2	21
Total	4	22	46	0	2	1	5	7	1	25	1	13	127
Approach%	5.6	30.6	63.9	-	66.7	33.3	38.5	53.8	7.7	64.1	2.6	33.3	
Total%	3.1	17.3	36.2	-	1.6	0.8	3.9	5.5	0.8	19.7	0.8	10.2	

PM Intersection Peak Hour: **17:00 to 18:00**

Volume	1	10	26	-	2	-	1	5	1	16	1	11	74
Approach%	2.7	27.0	70.3	-	100.0	-	14.3	71.4	14.3	57.1	3.6	39.3	
Total%	1.4	13.5	35.1	-	2.7	-	1.4	6.8	1.4	21.6	1.4	14.9	
PHF			0.71			0.25			0.58			0.44	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

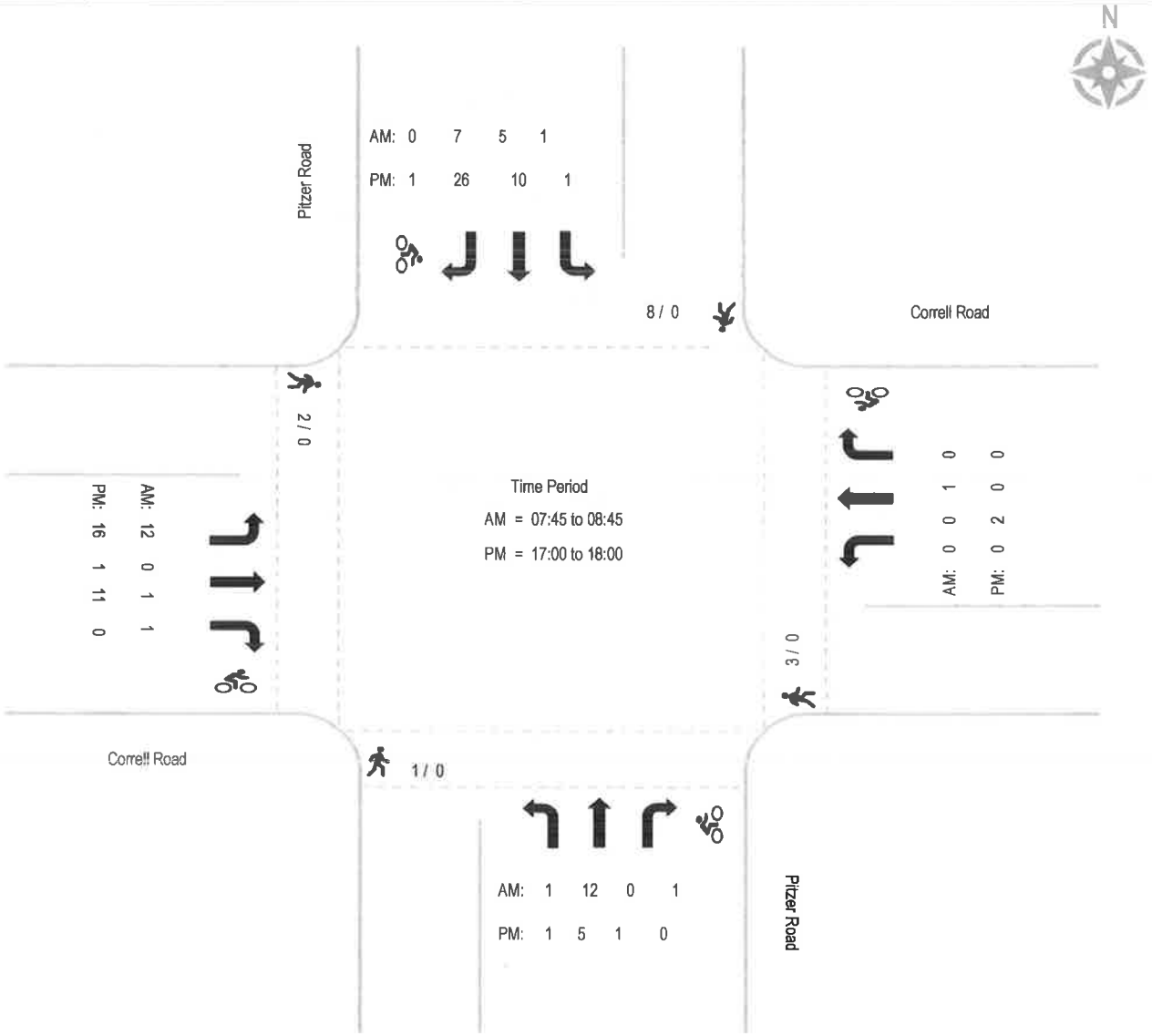
Location:	#04	File Name:	ITM-20-034-04
Intersection:	Pitzer Road & Correll Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Tuesday, October 01, 2020		Heber Meadows - Imperial

AM	Pitzer Road Southbound				Correll Road Westbound				Pitzer Road Northbound				Correll Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:45	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
8:15	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0
8:30	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	8				3				1				2				14	
Bike Total		0	0	0		0	0	0		0	1	0		0	0	1		2

PM	Pitzer Road Southbound				Correll Road Westbound				Pitzer Road Northbound				Correll Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ped Total	0				0				0				0				0	
Bike Total		0	1	0		0	0	0		0	0	0		0	0	0		1

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#04	File Name:	ITM-20-034-04
	Intersection:	Pitzer Road & Correll Road	Project:	LLG Ref. 3-20-3289
	Date of Count:	Tuesday, October 01, 2020		Heber Meadows - Imperial



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#05	File Name:	ITM-20-034-05
Intersection:	SR-111 & E. McCabe Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	SR-111 Southbound			E. McCabe Road Westbound			SR-111 Northbound			E. McCabe Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	0	99	2	0	5	3	0	185	0	3	3	6	306
7:15	1	104	7	0	4	6	0	219	0	2	5	1	349
7:30	4	117	6	0	9	7	0	233	0	5	3	6	390
7:45	1	146	6	0	9	6	0	220	0	7	3	1	399
8:00	0	149	3	0	1	1	0	132	0	4	2	5	297
8:15	2	153	5	0	8	3	0	175	1	7	4	3	361
8:30	2	114	1	0	2	5	0	188	0	4	7	2	325
8:45	0	136	5	0	4	3	0	158	0	5	5	4	320
Total	10	1018	35	0	42	34	0	1510	1	37	32	28	2747
Approach%	0.9	95.8	3.3	-	55.3	44.7	-	99.9	0.1	38.1	33.0	28.9	
Total%	0.4	37.1	1.3	-	1.5	1.2	-	55.0	0.0	1.3	1.2	1.0	

AM Intersection Peak Hour: **07:30 to 08:30**

Volume	7	565	20	-	27	17	-	760	1	23	12	15	1,447
Approach%	1.2	95.4	3.4	-	61.4	38.6	-	99.9	0.1	46.0	24.0	30.0	
Total%	0.5	39.0	1.4	-	1.9	1.2	-	52.5	0.1	1.6	0.8	1.0	
PHF			0.93			0.69			0.82			0.89	0.00

PM	SR-111 Southbound			E. McCabe Road Westbound			SR-111 Northbound			E. McCabe Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	3	291	6	0	2	1	21	191	0	3	7	36	561
16:15	7	335	6	1	6	1	30	163	0	5	6	44	604
16:30	7	341	12	2	3	0	15	167	0	1	5	20	573
16:45	6	308	7	0	6	0	16	152	0	2	1	32	530
17:00	3	291	9	0	4	2	24	174	0	2	8	32	549
17:15	12	307	9	0	4	0	27	172	0	5	12	39	587
17:30	6	277	7	0	1	3	24	209	0	5	2	29	563
17:45	2	232	9	0	3	4	24	171	0	6	5	28	484
Total	46	2382	65	3	29	11	181	1399	0	29	46	260	4451
Approach%	1.8	95.5	2.6	7.0	67.4	25.6	11.5	88.5	-	8.7	13.7	77.6	
Total%	1.0	53.5	1.5	0.1	0.7	0.2	4.1	31.4	-	0.7	1.0	5.8	

PM Intersection Peak Hour: **16:00 to 17:00**

Volume	23	1,275	31	3	17	2	82	673	-	11	19	132	2,268
Approach%	1.7	95.9	2.3	13.6	77.3	9.1	10.9	89.1	-	6.8	11.7	81.5	
Total%	1.0	56.2	1.4	0.1	0.7	0.1	3.6	29.7	-	0.5	0.8	5.8	
PHF			0.92			0.69			0.89			0.74	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

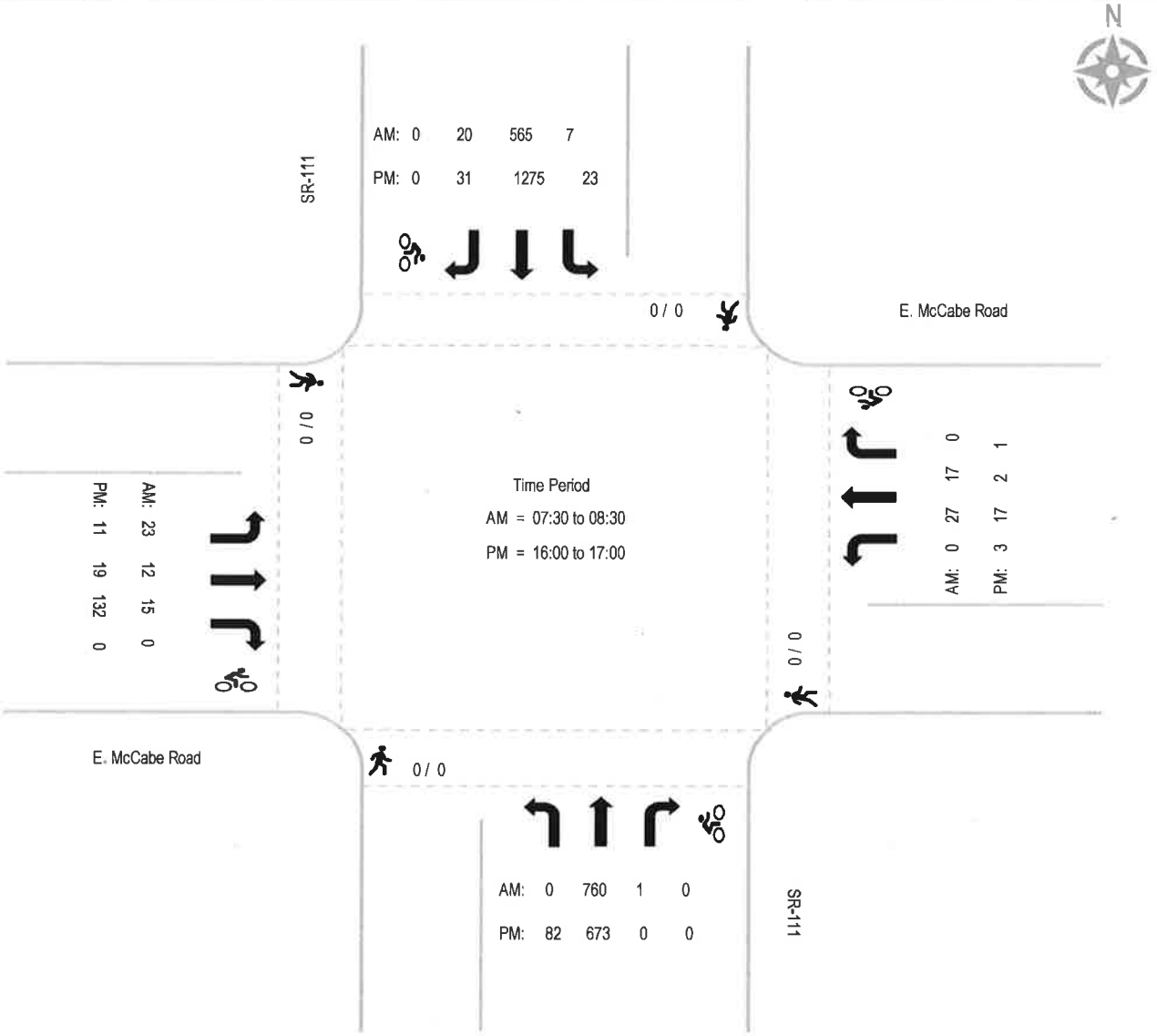
Location:	#05	File Name:	ITM-20-034-05
Intersection:	SR-111 & E. McCabe Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	SR-111 Southbound				E. McCabe Road Westbound				SR-111 Northbound				E. McCabe Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	SR-111 Southbound				E. McCabe Road Westbound				SR-111 Northbound				E. McCabe Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	1		0	0	0		0	0	0		1

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#05	File Name:	ITM-20-034-05
	Intersection:	SR-111 & E. McCabe Road	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#06	File Name:	ITM-20-034-06
Intersection:	SR-111 & E. Heber Road	Project:	LLG Ref. 3-20-3289
Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	SR-111 Southbound			E. Heber Road Westbound			SR-111 Northbound			E. Heber Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	7	90	4	1	9	13	9	170	6	5	6	0	320
7:15	7	93	2	6	6	12	10	188	6	7	7	0	344
7:30	8	100	3	5	10	16	18	198	5	8	7	1	379
7:45	6	125	7	4	10	20	27	191	7	5	4	0	406
8:00	7	136	9	1	7	12	20	124	4	4	9	2	335
8:15	9	136	7	6	8	13	16	154	8	6	9	0	372
8:30	4	110	7	4	10	18	17	157	10	7	14	0	358
8:45	5	121	6	9	8	14	16	153	12	1	8	0	353
Total	53	911	45	36	68	118	133	1335	58	43	64	3	2867
Approach%	5.3	90.3	4.5	16.2	30.6	53.2	8.7	87.5	3.8	39.1	58.2	2.7	
Total%	1.8	31.8	1.6	1.3	2.4	4.1	4.6	46.6	2.0	1.5	2.2	0.1	
AM Intersection Peak Hour:	**07:30 to 08:30**												
Volume	30	497	26	16	35	61	81	667	24	23	29	3	1,492
Approach%	5.4	89.9	4.7	14.3	31.3	54.5	10.5	86.4	3.1	41.8	52.7	5.5	
Total%	2.0	33.3	1.7	1.1	2.3	4.1	5.4	44.7	1.6	1.5	1.9	0.2	
PHF			0.91			0.82			0.86			0.86	0.00

PM	SR-111 Southbound			E. Heber Road Westbound			SR-111 Northbound			E. Heber Road Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	23	321	4	12	12	9	28	190	9	9	10	2	629
16:15	19	323	5	21	14	10	23	170	7	3	14	0	609
16:30	15	320	9	14	12	16	18	134	7	3	8	0	556
16:45	14	275	5	16	11	10	20	132	6	8	6	0	503
17:00	11	272	3	7	6	7	13	176	13	7	8	0	523
17:15	15	322	5	9	13	14	28	191	15	0	5	0	617
17:30	16	284	3	10	5	13	13	200	11	2	12	0	569
17:45	12	270	3	7	6	7	35	187	5	1	4	0	537
Total	125	2387	37	96	79	86	178	1380	73	33	67	2	4543
Approach%	4.9	93.6	1.5	36.8	30.3	33.0	10.9	84.6	4.5	32.4	65.7	2.0	
Total%	2.8	52.5	0.8	2.1	1.7	1.9	3.9	30.4	1.6	0.7	1.5	0.0	
PM Intersection Peak Hour:	**16:00 to 17:00**												
Volume	71	1,239	23	63	49	45	89	626	29	23	38	2	2,297
Approach%	5.3	92.9	1.7	40.1	31.2	28.7	12.0	84.1	3.9	36.5	60.3	3.2	
Total%	3.1	53.9	1.0	2.7	2.1	2.0	3.9	27.3	1.3	1.0	1.7	0.1	
PHF			0.96			0.87			0.82			0.75	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

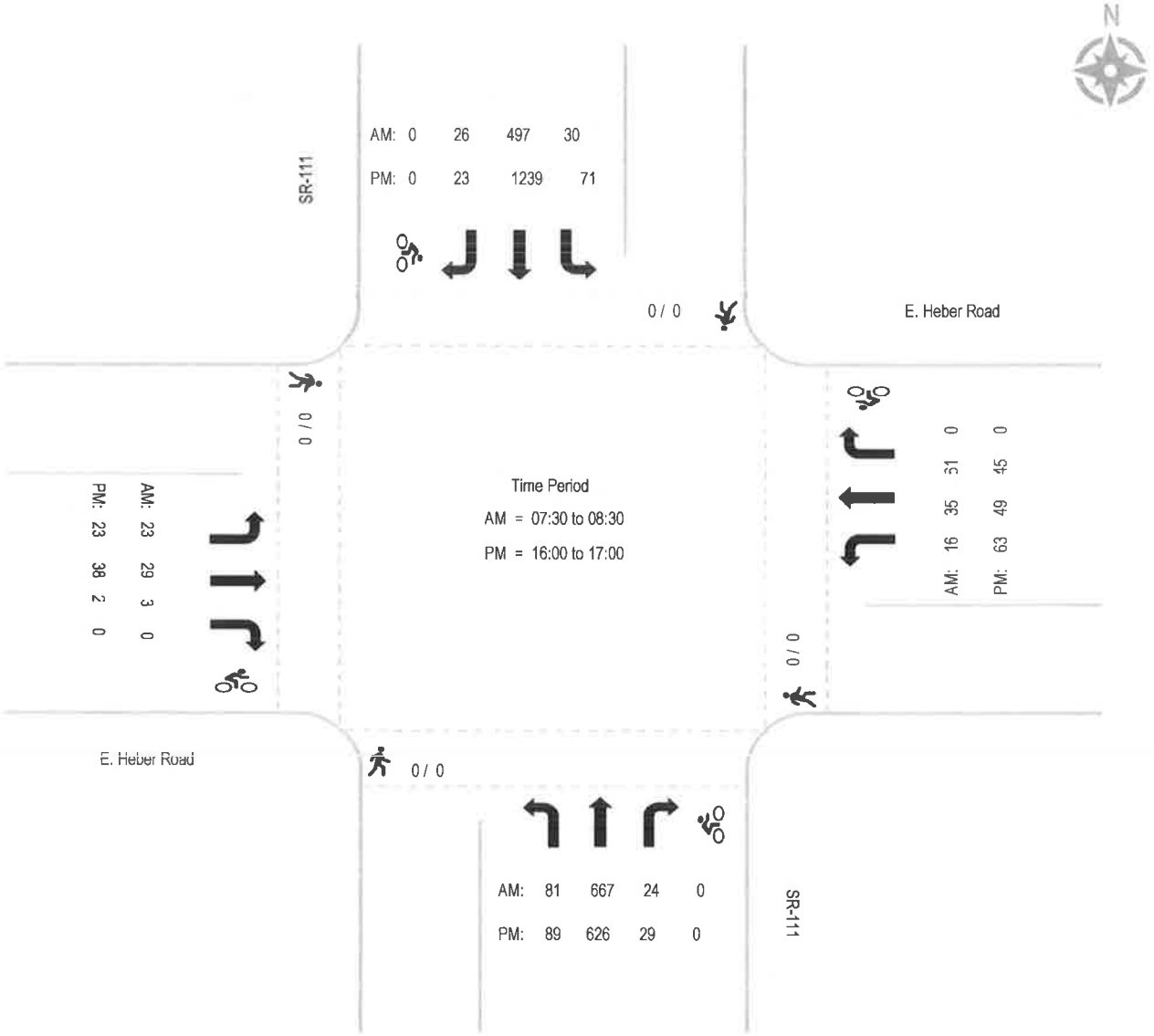
LINSCOTT LAW & GREENSPAN engineers	Location:	#06	File Name:	ITM-20-034-06
	Intersection:	SR-111 & E. Heber Road	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial

AM	SR-111 Southbound				E. Heber Road Westbound				SR-111 Northbound				E. Heber Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	SR-111 Southbound				E. Heber Road Westbound				SR-111 Northbound				E. Heber Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#06	File Name:	ITM-20-034-06
	Intersection:	SR-111 & E. Heber Road	Project:	LLG Ref. 3-20-3289
	Date of Count:	Thursday, September 24, 2020		Heber Meadows - Imperial



Linscott, Law & Greenspan, Engineers

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **Dogwood Rd, North of Correll Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **11323** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
63	55	50	72	130	292	328	569	514	522	546	697	718	781	773	787	911	978	782	675	488	292	193	107
19	13	6	17	30	46	49	95	128	119	122	166	205	181	164	171	220	248	219	189	151	78	53	25
18	19	13	14	27	75	77	132	136	122	169	162	173	208	190	195	258	244	195	183	108	83	67	34
17	14	13	19	40	83	95	160	126	148	116	175	163	202	221	215	218	273	192	141	119	71	47	29
9	9	18	22	33	88	107	182	124	133	139	194	177	190	198	206	215	213	176	162	110	60	26	19

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **5704** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
27	24	26	53	102	223	245	402	322	306	331	369	366	391	352	335	353	383	354	271	213	138	78	40
9	9	4	15	18	39	35	66	73	70	72	84	105	85	82	72	89	99	91	71	69	39	20	10
6	7	10	8	22	57	51	89	85	65	96	91	81	108	72	90	105	79	87	77	45	37	25	12
8	6	5	14	35	63	77	116	79	88	72	96	81	105	95	96	77	118	97	65	49	36	22	11
4	2	7	16	27	64	82	131	85	83	91	98	99	93	103	77	82	87	79	58	50	26	11	7

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **5619** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
36	31	24	19	28	69	83	167	192	216	215	328	352	390	421	452	558	595	428	404	275	154	115	67
10	4	2	2	12	7	14	29	55	49	50	82	100	96	82	99	131	149	128	118	82	39	33	15
12	12	3	6	5	18	26	43	51	57	73	71	92	100	118	105	153	165	108	106	63	46	42	22
9	8	8	5	5	20	18	44	47	60	44	79	82	97	126	119	141	155	95	76	70	35	25	18
5	7	11	6	6	24	25	51	39	50	48	96	78	97	95	129	133	126	97	104	60	34	15	12

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Linscott, Law & Greenspan, Engineers

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **Dogwood Rd, South of Correll Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **7219** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
37	26	34	38	85	181	218	345	355	386	396	464	462	510	508	521	580	566	488	404	283	167	106	59
11	8	3	11	17	24	29	54	84	70	86	119	130	120	121	114	135	157	137	115	90	52	32	14
11	9	7	7	20	54	56	85	84	88	121	112	127	147	128	142	159	145	115	114	67	38	30	24
8	4	7	7	26	50	66	105	95	124	85	112	94	127	140	144	139	145	119	96	73	43	31	10
7	5	17	13	22	53	67	101	92	104	104	121	111	116	119	121	147	119	117	79	53	34	13	11

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **3584** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
12	16	17	30	68	111	155	214	185	215	228	248	212	250	241	224	241	231	229	157	136	89	48	27
4	7	2	10	11	18	18	34	37	37	42	61	63	55	62	52	52	70	60	40	38	28	13	6
2	5	5	5	15	34	33	47	37	51	70	63	51	75	54	63	69	50	48	37	35	18	16	12
5	1	3	7	23	26	53	74	55	70	54	62	41	68	61	57	57	63	66	46	38	22	12	5
1	3	7	8	19	33	51	59	56	57	62	62	57	52	64	52	63	48	55	34	25	21	7	4

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **3635** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
25	10	17	8	17	70	63	131	170	171	168	216	250	260	267	297	339	335	259	247	147	78	58	32
7	1	1	1	6	6	11	20	47	33	44	58	67	65	59	62	83	87	77	75	52	24	19	8
9	4	2	2	5	20	23	38	47	37	51	49	76	72	74	79	90	95	67	77	32	20	14	12
3	3	4	0	3	24	13	31	40	54	31	50	53	59	79	87	82	82	53	50	35	21	19	5
6	2	10	5	3	20	16	42	36	47	42	59	54	64	55	69	84	71	62	45	28	13	6	7

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **E. McCabe Rd, West of Pitzer Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **1086** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	3	8	15	21	60	55	79	50	43	72	61	63	102	76	88	53	60	49	40	26	35	14	9
1	1	2	6	4	12	13	18	13	4	17	17	13	19	15	14	9	16	15	11	5	14	1	3
1	0	1	1	4	12	9	17	17	9	15	11	14	23	14	22	23	20	15	10	5	7	7	3
1	1	4	4	4	19	17	21	9	9	19	15	20	30	18	28	14	8	12	10	7	5	3	1
1	1	1	4	9	17	16	23	11	21	21	18	16	30	29	24	7	16	7	9	9	9	3	2

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **496** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
3	0	1	1	11	35	18	29	20	17	24	25	37	55	31	45	24	34	26	21	12	19	4	4
1	0	0	0	2	7	4	11	6	3	5	7	9	12	5	9	3	10	9	6	3	11	1	1
0	0	0	1	3	7	3	9	7	4	4	4	6	14	7	12	13	10	10	8	0	3	1	2
1	0	1	0	2	15	7	6	4	4	7	5	15	14	8	10	4	5	6	5	4	2	0	1
1	0	0	0	4	6	4	3	3	6	8	9	7	15	11	14	4	9	1	2	5	3	2	0

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **590** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	3	7	14	10	25	37	50	30	26	48	36	26	47	45	43	29	26	23	19	14	16	10	5
0	1	2	6	2	5	9	7	7	1	12	10	4	7	10	5	6	6	6	5	2	3	0	2
1	0	1	0	1	5	6	8	10	5	11	7	8	9	7	10	10	10	5	2	5	4	6	1
0	1	3	4	2	4	10	15	5	5	12	10	5	16	10	18	10	3	6	5	3	3	3	0
0	1	1	4	5	11	12	20	8	15	13	9	9	15	18	10	3	7	6	7	4	6	1	2

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **E. McCabe Rd, East of Pitzer Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **3771** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
18	6	21	41	67	107	82	140	139	161	213	235	260	303	294	338	301	320	275	207	111	70	38	24
3	1	4	9	18	22	17	23	31	22	44	61	58	71	60	92	81	82	83	59	33	27	15	3
2	2	4	10	16	26	10	30	40	44	50	42	64	74	69	85	93	90	75	57	29	14	7	8
4	3	6	10	19	29	32	39	30	40	66	64	75	80	78	86	67	77	59	50	28	15	12	4
9	0	7	12	14	30	23	48	38	55	53	68	63	78	87	75	60	71	58	41	21	14	4	9

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **1864** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
14	2	4	11	41	61	35	48	57	38	67	92	132	164	144	175	161	172	161	139	69	41	24	12
3	0	0	0	11	10	6	12	11	7	14	20	26	42	27	52	45	43	45	34	23	17	12	1
0	2	0	6	12	18	5	11	17	10	15	16	27	38	36	51	53	55	45	39	15	7	1	4
2	0	1	1	12	19	16	15	17	9	21	31	40	40	40	36	28	38	34	37	19	9	9	1
9	0	3	4	6	14	8	10	12	12	17	25	39	44	41	36	35	36	37	29	12	8	2	6

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **1907** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	4	17	30	26	46	47	92	82	123	146	143	128	139	150	163	140	148	114	68	42	29	14	12
0	1	4	9	7	12	11	11	20	15	30	41	32	29	33	40	36	39	38	25	10	10	3	2
2	0	4	4	4	8	5	19	23	34	35	26	37	36	33	34	40	35	30	18	14	7	6	4
2	3	5	9	7	10	16	24	13	31	45	33	35	40	38	50	39	39	25	13	9	6	3	3
0	0	4	8	8	16	15	38	26	43	36	43	24	34	46	39	25	35	21	12	9	6	2	3

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **Pitzer Rd, between E. McCabe Rd and Correll Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **704** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
6	1	4	14	30	46	32	40	33	32	23	27	41	37	52	65	59	57	39	28	17	11	7	3
1	0	1	3	8	11	7	8	9	7	4	7	10	6	9	18	10	16	16	9	6	1	4	0
2	0	2	5	7	11	12	7	11	5	7	6	10	10	12	14	8	16	8	7	4	6	0	2
2	1	1	4	8	8	8	11	6	8	7	8	12	11	17	15	17	17	8	6	3	2	3	1
1	0	0	2	7	16	5	14	7	12	5	6	9	10	14	18	24	8	7	6	4	2	0	0

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **340** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
3	0	1	6	22	41	17	29	23	20	15	11	12	24	17	21	19	23	16	9	5	4	2	0
1	0	0	0	6	9	4	5	7	5	3	2	3	3	2	6	4	4	6	1	3	0	1	0
1	0	0	3	7	9	3	4	7	3	3	3	3	6	5	4	3	9	3	3	1	2	0	0
0	0	1	2	6	8	7	9	5	3	5	3	3	8	7	6	4	8	4	3	1	1	1	0
1	0	0	1	3	15	3	11	4	9	4	3	3	7	3	5	8	2	3	2	0	1	0	0

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **364** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
3	1	3	8	8	5	15	11	10	12	8	16	29	13	35	44	40	34	23	19	12	7	5	3
0	0	1	3	2	2	3	3	2	2	1	5	7	3	7	12	6	12	10	8	3	1	3	0
1	0	2	2	0	2	9	3	4	2	4	3	7	4	7	10	5	7	5	4	3	4	0	2
2	1	0	2	2	0	1	2	1	5	2	5	9	3	10	9	13	9	4	3	2	1	2	1
0	0	0	1	4	1	2	3	3	3	1	3	6	3	11	13	16	6	4	4	4	1	0	0

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **SR-86, West of Pitzer Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **4415** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
12	22	31	34	69	136	157	242	278	265	262	276	266	274	272	304	352	267	279	216	170	116	71	44
2	4	6	8	10	26	28	47	63	53	65	83	80	70	67	74	89	59	71	48	42	33	20	8
6	6	7	7	12	21	34	55	78	69	63	61	61	70	73	69	85	79	85	69	41	27	19	15
2	7	8	6	24	43	42	62	71	72	78	62	70	65	75	82	85	63	68	57	47	30	18	7
2	5	10	13	23	46	53	78	66	71	56	70	55	69	57	79	93	66	55	42	40	26	14	14

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **2264** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	9	11	16	28	72	80	116	146	146	155	130	146	140	136	172	184	144	133	113	79	50	33	21
0	0	3	6	4	14	18	23	34	34	40	35	48	31	38	40	50	40	38	25	23	8	8	3
3	2	3	3	4	12	18	34	41	34	42	25	31	38	26	39	36	36	44	38	16	12	11	9
1	5	2	1	9	22	23	34	37	43	37	34	36	41	43	55	52	37	26	30	21	21	9	1
0	2	3	6	11	24	21	25	34	35	36	36	31	30	29	38	46	31	25	20	19	9	5	8

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **2151** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
8	13	20	18	41	64	77	126	132	119	107	146	120	134	136	132	168	123	146	103	91	66	38	23
2	4	3	2	6	12	10	24	29	19	25	48	32	39	29	34	39	19	33	23	19	25	12	5
3	4	4	4	8	9	16	21	37	35	21	36	30	32	47	30	49	43	41	31	25	15	8	6
1	2	6	5	15	21	19	28	34	29	41	28	34	24	32	27	33	26	42	27	26	9	9	6
2	3	7	7	12	22	32	53	32	36	20	34	24	39	28	41	47	35	30	22	21	17	9	6

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **SR-86, East of Pitzer Rd**

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **4234** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
12	18	31	34	70	141	153	222	272	245	254	258	247	268	259	279	329	263	281	213	166	108	69	42
2	5	6	7	10	27	26	44	67	50	69	75	68	66	67	67	92	57	70	51	45	31	18	9
5	5	7	8	14	24	31	52	77	62	62	64	54	71	69	63	75	85	87	64	38	22	19	14
3	3	7	6	24	44	42	60	69	72	70	59	69	66	66	70	78	54	68	57	44	28	17	7
2	5	11	13	22	46	54	66	59	61	53	60	56	65	57	79	84	67	56	41	39	27	15	12

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **2167** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	6	11	16	30	77	77	114	142	132	152	121	131	142	129	153	171	143	136	107	78	43	33	19
0	0	3	5	4	17	14	23	35	31	46	33	40	29	35	33	52	38	35	28	26	7	8	3
2	2	3	4	4	13	17	35	42	29	41	24	28	42	26	36	33	40	46	33	16	10	11	9
2	2	2	1	10	23	21	34	36	40	29	33	34	41	38	46	45	34	30	29	19	19	8	1
0	2	3	6	12	24	25	22	29	32	36	31	29	30	30	38	41	31	25	17	17	7	6	6

Date: **Thursday, Sepember 24, 2020** Total Daily Volume: **2067** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
8	12	20	18	40	64	76	108	130	113	102	137	116	126	130	126	158	120	145	106	88	65	36	23
2	5	3	2	6	10	12	21	32	19	23	42	28	37	32	34	40	19	35	23	19	24	10	6
3	3	4	4	10	11	14	17	35	33	21	40	26	29	43	27	42	45	41	31	22	12	8	5
1	1	5	5	14	21	21	26	33	32	41	26	35	25	28	24	33	20	38	28	25	9	9	6
2	3	8	7	10	22	29	44	30	29	17	29	27	35	27	41	43	36	31	24	22	20	9	6

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Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
0	Jct. Rte. 111				510	5800	5500
2.077	Dogwood Road	620	6400	5900	530	5200	4850
3.05	West Heber Turn	530	5200	4850	400	4050	3800
4.53	Mc Cabe Road	400	4050	3800	610	8000	7900
6.006	Jct. Rte. 8	2250	24100	23000	2900	32500	31000
6.534	El Centro, Ross Avenue	2900	32500	31000	2800	30000	29000
7.24	El Centro, State Street	2800	30000	29000	2550	29000	28000
7.308	Main Street	2550	29000	28000	1700	20600	19000
8.028	El Centro, Eighth Street	1700	20600	19000	1550	18100	17100
8.525	Adams/Imperial Avenues	1550	18100	17100	2600	31500	28500

APPENDIX B
PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	14	59	7	11	136	25	241	17	60	168	29
Future Volume (veh/h)	71	14	59	7	11	136	25	241	17	60	168	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	15	64	8	12	148	27	262	18	65	183	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	315	267	18	230	195	52	880	60	92	1611	277
Arrive On Green	0.06	0.17	0.17	0.01	0.12	0.12	0.03	0.51	0.51	0.05	0.53	0.53
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1730	119	1781	3033	521
Grp Volume(v), veh/h	77	15	64	8	12	148	27	0	280	65	106	109
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1849	1781	1777	1777
Q Serve(g_s), s	2.9	0.5	2.4	0.3	0.4	6.2	1.0	0.0	6.1	2.5	2.1	2.1
Cycle Q Clear(g_c), s	2.9	0.5	2.4	0.3	0.4	6.2	1.0	0.0	6.1	2.5	2.1	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.29
Lane Grp Cap(c), veh/h	100	315	267	18	230	195	52	0	941	92	944	944
V/C Ratio(X)	0.77	0.05	0.24	0.44	0.05	0.76	0.52	0.00	0.30	0.71	0.11	0.12
Avail Cap(c_a), veh/h	250	625	530	132	501	424	183	0	941	405	944	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	24.1	24.9	34.0	26.7	29.3	33.1	0.0	9.8	32.2	8.1	8.1
Incr Delay (d2), s/veh	12.0	0.1	0.5	15.4	0.1	5.9	7.7	0.0	0.8	9.5	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.2	0.9	0.2	0.2	2.6	0.5	0.0	2.4	1.3	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	24.1	25.3	49.4	26.8	35.2	40.8	0.0	10.6	41.8	8.3	8.3
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	A	A
Approach Vol, veh/h		156			168			307			280	
Approach Delay, s/veh		34.5			35.3			13.3			16.1	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	39.7	5.2	16.1	6.5	41.2	8.4	13.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.7	28.1	5.1	23.1	7.1	36.7	9.7	18.5
Max Q Clear Time (g_c+I1), s	4.5	8.1	2.3	4.4	3.0	4.1	4.9	8.2
Green Ext Time (p_c), s	0.1	1.6	0.0	0.2	0.0	1.3	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	88	132	11	87	118	125	147	6	132	137	14
Future Vol, veh/h	4	88	132	11	87	118	125	147	6	132	137	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	96	143	12	95	128	136	160	7	143	149	15
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11	11	14.9	15.1
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	45%	4%	0%	11%	0%	47%
Vol Thru, %	53%	96%	0%	89%	0%	48%
Vol Right, %	2%	0%	100%	0%	100%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	278	92	132	98	118	283
LT Vol	125	4	0	11	0	132
Through Vol	147	88	0	87	0	137
RT Vol	6	0	132	0	118	14
Lane Flow Rate	302	100	143	107	128	308
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.5	0.189	0.241	0.203	0.216	0.507
Departure Headway (Hd)	5.961	6.796	6.057	6.844	6.07	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	601	524	587	520	586	603
Service Time	4.047	4.593	3.854	4.642	3.867	4.024
HCM Lane V/C Ratio	0.502	0.191	0.244	0.206	0.218	0.511
HCM Control Delay	14.9	11.2	10.8	11.4	10.6	15.1
HCM Lane LOS	B	B	B	B	B	C
HCM 95th-tile Q	2.8	0.7	0.9	0.8	0.8	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	7	4	11	64	78	0	18	25	4	25	0
Future Volume (veh/h)	0	7	4	11	64	78	0	18	25	4	25	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	8	4	12	70	85	0	20	27	4	27	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	114	57	98	160	154	0	454	613	10	1355	0
Arrive On Green	0.00	0.10	0.10	0.10	0.10	0.10	0.00	0.63	0.63	0.01	0.72	0.00
Sat Flow, veh/h	0	1176	588	164	1652	1585	0	721	974	1781	1870	0
Grp Volume(v), veh/h	0	0	12	82	0	85	0	0	47	4	27	0
Grp Sat Flow(s),veh/h/ln	0	0	1764	1816	0	1585	0	0	1695	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.3	0.3	0.0	2.6	0.0	0.0	0.5	0.1	0.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.3	2.1	0.0	2.6	0.0	0.0	0.5	0.1	0.2	0.0
Prop In Lane	0.00		0.33	0.15		1.00	0.00		0.57	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	171	258	0	154	0	0	1067	10	1355	0
V/C Ratio(X)	0.00	0.00	0.07	0.32	0.00	0.55	0.00	0.00	0.04	0.42	0.02	0.00
Avail Cap(c_a), veh/h	0	0	1558	1660	0	1400	0	0	1067	300	1355	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	20.7	21.5	0.0	21.7	0.0	0.0	3.6	25.0	1.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.7	0.0	3.1	0.0	0.0	0.1	26.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.9	0.0	1.0	0.0	0.0	0.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	20.9	22.2	0.0	24.8	0.0	0.0	3.6	51.1	2.0	0.0
LnGrp LOS	A	A	C	C	A	C	A	A	A	D	A	A
Approach Vol, veh/h		12			167			47			31	
Approach Delay, s/veh		20.9			23.5			3.6			8.3	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.8	36.2		9.4		41.0		9.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	8.5	23.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.1	2.5		2.3		2.2		4.6				
Green Ext Time (p_c), s	0.0	0.2		0.0		0.1		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	1	1	17	7	10
Future Vol, veh/h	17	1	1	17	7	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	1	1	18	8	11
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Righ	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.3	7.1	6.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	6%	94%	0%
Vol Thru, %	94%	0%	41%
Vol Right, %	0%	6%	59%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	18	18	17
LT Vol	1	17	0
Through Vol	17	0	7
RT Vol	0	1	10
Lane Flow Rate	20	20	18
Geometry Grp	1	1	1
Degree of Util (X)	0.022	0.023	0.019
Departure Headway (Hd)	3.992	4.154	3.629
Convergence, Y/N	Yes	Yes	Yes
Cap	899	864	988
Service Time	2.007	2.169	1.645
HCM Lane V/C Ratio	0.022	0.023	0.018
HCM Control Delay	7.1	7.3	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	17	21	0	38	24	0	1064	1	10	791	28
Future Volume (veh/h)	32	17	21	0	38	24	0	1064	1	10	791	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	18	23	0	41	26	0	1157	1	11	860	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	260	387	2	100	85	4	2517	2	24	2689	1199
Arrive On Green	0.03	0.14	0.14	0.00	0.05	0.05	0.00	0.69	0.69	0.01	0.76	0.76
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3643	3	1781	3554	1585
Grp Volume(v), veh/h	35	18	23	0	41	26	0	564	594	11	860	30
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	1870	1781	1777	1585
Q Serve(g_s), s	1.7	0.7	0.6	0.0	1.8	1.4	0.0	12.4	12.4	0.5	6.7	0.4
Cycle Q Clear(g_c), s	1.7	0.7	0.6	0.0	1.8	1.4	0.0	12.4	12.4	0.5	6.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	260	387	2	100	85	4	1228	1292	24	2689	1199
V/C Ratio(X)	0.60	0.07	0.06	0.00	0.41	0.31	0.00	0.46	0.46	0.46	0.32	0.03
Avail Cap(c_a), veh/h	176	478	713	103	402	341	201	1228	1292	114	2689	1199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	32.2	32.2	0.0	39.4	39.2	0.0	6.0	6.0	42.2	3.4	2.6
Incr Delay (d2), s/veh	9.3	0.1	0.1	0.0	2.6	2.0	0.0	1.2	1.2	13.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.2	0.0	0.9	0.6	0.0	4.2	4.3	0.3	1.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	32.4	32.3	0.0	42.1	41.2	0.0	7.3	7.2	55.3	3.7	2.6
LnGrp LOS	D	C	C	A	D	D	A	A	A	E	A	A
Approach Vol, veh/h		76			67			1158			901	
Approach Delay, s/veh		40.6			41.7			7.2			4.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	64.0	0.0	16.5	0.0	69.7	7.3	9.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	59.5	5.0	22.0	5.0	60.0	8.5	18.5
Max Q Clear Time (g_c+I1), s	2.5	14.4	0.0	2.7	0.0	8.7	3.7	3.8
Green Ext Time (p_c), s	0.0	10.2	0.0	0.1	0.0	7.7	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	41	4	22	49	85	113	934	34	42	696	36
Future Volume (veh/h)	32	41	4	22	49	85	113	934	34	42	696	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	45	4	24	53	92	123	1015	37	46	757	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	94	81	6	91	134	149	158	2487	91	69	2273	117
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.71	0.71	0.04	0.66	0.66
Sat Flow, veh/h	374	864	62	383	1420	1585	1781	3497	127	1781	3438	177
Grp Volume(v), veh/h	84	0	0	77	0	92	123	516	536	46	391	405
Grp Sat Flow(s),veh/h/ln	1300	0	0	1803	0	1585	1781	1777	1847	1781	1777	1838
Q Serve(g_s), s	2.5	0.0	0.0	0.0	0.0	4.8	5.8	10.2	10.2	2.2	8.3	8.3
Cycle Q Clear(g_c), s	5.9	0.0	0.0	3.4	0.0	4.8	5.8	10.2	10.2	2.2	8.3	8.3
Prop In Lane	0.42		0.05	0.31		1.00	1.00		0.07	1.00		0.10
Lane Grp Cap(c), veh/h	181	0	0	224	0	149	158	1264	1314	69	1175	1215
V/C Ratio(X)	0.46	0.00	0.00	0.34	0.00	0.62	0.78	0.41	0.41	0.67	0.33	0.33
Avail Cap(c_a), veh/h	454	0	0	521	0	431	463	1264	1314	237	1175	1215
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	0.0	37.0	0.0	37.7	38.6	5.1	5.1	41.0	6.4	6.4
Incr Delay (d2), s/veh	1.8	0.0	0.0	0.9	0.0	4.1	8.0	1.0	0.9	10.6	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	1.6	0.0	2.0	2.9	3.3	3.4	1.2	2.9	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	0.0	37.9	0.0	41.8	46.6	6.1	6.0	51.6	7.1	7.1
LnGrp LOS	D	A	A	D	A	D	D	A	A	D	A	A
Approach Vol, veh/h		84			169			1175			842	
Approach Delay, s/veh		39.9			40.0			10.3			9.6	
Approach LOS		D			D			B			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.8	66.0		12.6	12.2	61.7		12.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	11.5	61.5		23.5	22.5	50.5		23.5
Max Q Clear Time (g_c+I1), s	4.2	12.2		7.9	7.8	10.3		6.8
Green Ext Time (p_c), s	0.0	8.9		0.3	0.2	5.9		0.6

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↾	
Traffic Vol, veh/h	181	7	6	193	18	17
Future Vol, veh/h	181	7	6	193	18	17
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	197	8	7	210	20	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	205	0	425	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	224	-
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	-	-	1366	-	586	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1366	-	582	840
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	808	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	684	-	-	1366	-
HCM Lane V/C Ratio	0.056	-	-	0.005	-
HCM Control Delay (s)	10.6	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	22	24	13	15	111	49	287	8	143	465	118
Future Volume (veh/h)	73	22	24	13	15	111	49	287	8	143	465	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	24	26	14	16	121	53	312	9	155	505	128
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	272	230	30	196	166	82	843	24	198	1493	376
Arrive On Green	0.06	0.15	0.15	0.02	0.10	0.10	0.05	0.47	0.47	0.11	0.53	0.53
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1809	52	1781	2811	709
Grp Volume(v), veh/h	79	24	26	14	16	121	53	0	321	155	318	315
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1861	1781	1777	1743
Q Serve(g_s), s	3.0	0.8	1.0	0.5	0.5	5.1	2.0	0.0	7.7	5.9	7.1	7.1
Cycle Q Clear(g_c), s	3.0	0.8	1.0	0.5	0.5	5.1	2.0	0.0	7.7	5.9	7.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.41
Lane Grp Cap(c), veh/h	102	272	230	30	196	166	82	0	868	198	944	925
V/C Ratio(X)	0.77	0.09	0.11	0.46	0.08	0.73	0.64	0.00	0.37	0.78	0.34	0.34
Avail Cap(c_a), veh/h	250	625	530	131	501	424	183	0	868	405	944	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	25.6	25.7	33.7	27.9	30.0	32.4	0.0	11.9	29.9	9.3	9.3
Incr Delay (d2), s/veh	11.6	0.1	0.2	10.5	0.2	5.9	8.1	0.0	1.2	6.7	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.3	0.4	0.3	0.2	2.1	1.0	0.0	3.1	2.8	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	25.7	25.9	44.1	28.1	35.9	40.5	0.0	13.1	36.6	10.2	10.3
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	B	B
Approach Vol, veh/h		129			151			374			788	
Approach Delay, s/veh		36.8			35.9			17.0			15.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.2	36.7	5.7	14.5	7.7	41.2	8.5	11.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.7	28.1	5.1	23.1	7.1	36.7	9.7	18.5
Max Q Clear Time (g_c+I1), s	7.9	9.7	2.5	3.0	4.0	9.1	5.0	7.1
Green Ext Time (p_c), s	0.2	1.8	0.0	0.1	0.0	4.3	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	36.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	122	272	8	73	132	101	207	14	125	315	7
Future Vol, veh/h	20	122	272	8	73	132	101	207	14	125	315	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	133	296	9	79	143	110	225	15	136	342	8
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	20.2	14.7	31.3	67
HCM LOS	C	B	D	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	31%	14%	0%	10%	0%	28%
Vol Thru, %	64%	86%	0%	90%	0%	70%
Vol Right, %	4%	0%	100%	0%	100%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	322	142	272	81	132	447
LT Vol	101	20	0	8	0	125
Through Vol	207	122	0	73	0	315
RT Vol	14	0	272	0	132	7
Lane Flow Rate	350	154	296	88	143	486
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.755	0.361	0.625	0.219	0.326	0.995
Departure Headway (Hd)	7.767	8.414	7.612	8.953	8.169	7.369
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	466	426	473	400	438	491
Service Time	5.847	6.191	5.389	6.741	5.957	5.438
HCM Lane V/C Ratio	0.751	0.362	0.626	0.22	0.326	0.99
HCM Control Delay	31.3	15.9	22.4	14.3	14.9	67
HCM Lane LOS	D	C	C	B	B	F
HCM 95th-tile Q	6.4	1.6	4.2	0.8	1.4	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	24	1	32	28	130	1	15	18	1	41	4
Future Volume (veh/h)	183	24	1	32	28	130	1	15	18	1	41	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	199	26	1	35	30	141	1	16	20	1	45	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	40	1	292	225	392	66	408	486	3	1022	91
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.00	0.60	0.60
Sat Flow, veh/h	993	164	5	810	909	1585	9	773	920	1781	1693	150
Grp Volume(v), veh/h	226	0	0	65	0	141	37	0	0	1	0	49
Grp Sat Flow(s),veh/h/ln	1162	0	0	1719	0	1585	1701	0	0	1781	0	1843
Q Serve(g_s), s	9.8	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.7
Cycle Q Clear(g_c), s	11.4	0.0	0.0	1.6	0.0	4.4	0.6	0.0	0.0	0.0	0.0	0.7
Prop In Lane	0.88		0.00	0.54		1.00	0.03		0.54	1.00		0.08
Lane Grp Cap(c), veh/h	399	0	0	517	0	392	960	0	0	3	0	1113
V/C Ratio(X)	0.57	0.00	0.00	0.13	0.00	0.36	0.04	0.00	0.00	0.34	0.00	0.04
Avail Cap(c_a), veh/h	1018	0	0	1286	0	1167	960	0	0	250	0	1113
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	0.0	0.0	17.7	0.0	18.8	6.9	0.0	0.0	30.1	0.0	4.9
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.1	0.0	0.6	0.1	0.0	0.0	56.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.7	0.0	1.6	0.2	0.0	0.0	0.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	0.0	0.0	17.9	0.0	19.4	7.0	0.0	0.0	87.0	0.0	4.9
LnGrp LOS	C	A	A	B	A	B	A	A	A	F	A	A
Approach Vol, veh/h		226			206			37			50	
Approach Delay, s/veh		23.2			18.9			7.0			6.6	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.6	36.4		19.4		41.0		19.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	8.5	23.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.0	2.6		13.4		2.7		6.4				
Green Ext Time (p_c), s	0.0	0.1		1.6		0.2		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	15	1	7	14	36
Future Vol, veh/h	22	15	1	7	14	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	16	1	8	15	39
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.1	6.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	12%	59%	0%
Vol Thru, %	88%	0%	28%
Vol Right, %	0%	41%	72%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	8	37	50
LT Vol	1	22	0
Through Vol	7	0	14
RT Vol	0	15	36
Lane Flow Rate	9	40	54
Geometry Grp	1	1	1
Degree of Util (X)	0.01	0.044	0.054
Departure Headway (Hd)	4.071	3.919	3.579
Convergence, Y/N	Yes	Yes	Yes
Cap	880	916	1002
Service Time	2.092	1.934	1.597
HCM Lane V/C Ratio	0.01	0.044	0.054
HCM Control Delay	7.1	7.1	6.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.1	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	27	185	4	24	3	115	942	0	32	1785	43
Future Volume (veh/h)	15	27	185	4	24	3	115	942	0	32	1785	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	29	201	4	26	3	125	1024	0	35	1940	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	32	181	270	9	157	133	187	2417	0	56	2336	1042
Arrive On Green	0.02	0.10	0.10	0.01	0.08	0.08	0.05	0.68	0.00	0.03	0.66	0.66
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3647	0	1781	3554	1585
Grp Volume(v), veh/h	16	29	201	4	26	3	125	1024	0	35	1940	47
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	0	1781	1777	1585
Q Serve(g_s), s	0.9	1.4	6.8	0.2	1.2	0.2	3.4	12.5	0.0	1.9	39.8	1.0
Cycle Q Clear(g_c), s	0.9	1.4	6.8	0.2	1.2	0.2	3.4	12.5	0.0	1.9	39.8	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	32	181	270	9	157	133	187	2417	0	56	2336	1042
V/C Ratio(X)	0.50	0.16	0.74	0.43	0.17	0.02	0.67	0.42	0.00	0.62	0.83	0.05
Avail Cap(c_a), veh/h	92	348	520	92	348	295	197	2417	0	118	2336	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	40.0	42.5	47.9	41.1	40.6	44.8	6.9	0.0	46.2	12.5	5.8
Incr Delay (d2), s/veh	11.4	0.4	4.0	27.8	0.5	0.1	7.8	0.5	0.0	10.8	3.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.6	2.5	0.2	0.6	0.1	1.7	4.3	0.0	1.0	14.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	40.4	46.5	75.7	41.6	40.7	52.6	7.5	0.0	57.0	16.1	5.9
LnGrp LOS	E	D	D	E	D	D	D	A	A	E	B	A
Approach Vol, veh/h		246			33			1149			2022	
Approach Delay, s/veh		46.6			45.6			12.4			16.6	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	70.2	5.0	13.9	9.7	68.0	6.2	12.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.4	62.6	5.0	18.0	5.5	63.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	13.9	14.5	2.2	8.8	5.4	41.8	2.9	3.2
Green Ext Time (p_c), s	0.0	9.7	0.0	0.6	0.0	16.2	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	53	3	88	69	63	125	876	41	99	1735	32
Future Volume (veh/h)	32	53	3	88	69	63	125	876	41	99	1735	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	58	3	96	75	68	136	952	45	108	1886	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	55	72	3	148	89	273	165	2163	102	135	2176	40
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.09	0.63	0.63	0.08	0.61	0.61
Sat Flow, veh/h	51	419	15	553	517	1585	1781	3455	163	1781	3569	66
Grp Volume(v), veh/h	96	0	0	171	0	68	136	490	507	108	936	985
Grp Sat Flow(s),veh/h/ln	485	0	0	1070	0	1585	1781	1777	1841	1781	1777	1858
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	4.0	8.1	15.3	15.3	6.4	46.7	47.3
Cycle Q Clear(g_c), s	18.5	0.0	0.0	16.9	0.0	4.0	8.1	15.3	15.3	6.4	46.7	47.3
Prop In Lane	0.36		0.03	0.56		1.00	1.00		0.09	1.00		0.04
Lane Grp Cap(c), veh/h	129	0	0	237	0	273	165	1113	1153	135	1083	1133
V/C Ratio(X)	0.74	0.00	0.00	0.72	0.00	0.25	0.82	0.44	0.44	0.80	0.86	0.87
Avail Cap(c_a), veh/h	129	0	0	237	0	273	207	1113	1153	224	1083	1133
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	0.0	43.5	0.0	38.5	47.9	10.4	10.4	48.8	17.3	17.4
Incr Delay (d2), s/veh	20.4	0.0	0.0	10.4	0.0	0.5	19.0	1.3	1.2	10.2	9.2	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	0.0	5.1	0.0	1.6	4.4	6.0	6.2	3.2	20.1	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	0.0	0.0	53.9	0.0	38.9	66.9	11.6	11.6	59.0	26.5	26.6
LnGrp LOS	E	A	A	D	A	D	E	B	B	E	C	C
Approach Vol, veh/h		96			239			1133			2029	
Approach Delay, s/veh		63.5			49.6			18.2			28.3	
Approach LOS		E			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.7	71.8		23.0	14.5	70.0		23.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	8.5	64.5		18.5	12.5	65.5		18.5
Max Q Clear Time (g_c+I1), s	8.4	17.3		20.5	10.1	49.3		18.9
Green Ext Time (p_c), s	0.1	8.2		0.0	0.1	12.5		0.0

Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	189	18	17	209	11	10
Future Vol, veh/h	189	18	17	209	11	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	205	20	18	227	12	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	225	0	478	215
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	263	-
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	-	-	1344	-	546	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1344	-	538	825
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	645	-	-	1344	-
HCM Lane V/C Ratio	0.035	-	-	0.014	-
HCM Control Delay (s)	10.8	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

APPENDIX C

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING + PROJECT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	14	59	11	11	179	25	241	18	75	168	29
Future Volume (veh/h)	71	14	59	11	11	179	25	241	18	75	168	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	15	64	12	12	195	27	262	20	82	183	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	361	306	26	284	241	52	825	63	108	1553	267
Arrive On Green	0.06	0.19	0.19	0.01	0.15	0.15	0.03	0.48	0.48	0.06	0.51	0.51
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1716	131	1781	3033	521
Grp Volume(v), veh/h	77	15	64	12	12	195	27	0	282	82	106	109
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1847	1781	1777	1777
Q Serve(g_s), s	3.1	0.5	2.4	0.5	0.4	8.5	1.1	0.0	6.7	3.2	2.2	2.3
Cycle Q Clear(g_c), s	3.1	0.5	2.4	0.5	0.4	8.5	1.1	0.0	6.7	3.2	2.2	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.29
Lane Grp Cap(c), veh/h	99	361	306	26	284	241	52	0	888	108	910	910
V/C Ratio(X)	0.78	0.04	0.21	0.45	0.04	0.81	0.52	0.00	0.32	0.76	0.12	0.12
Avail Cap(c_a), veh/h	211	556	471	132	472	400	216	0	888	460	910	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	23.5	24.3	35.0	25.9	29.4	34.3	0.0	11.4	33.2	9.1	9.1
Incr Delay (d2), s/veh	12.1	0.0	0.3	11.7	0.1	6.4	7.9	0.0	0.9	10.5	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.2	0.9	0.3	0.2	3.5	0.6	0.0	2.7	1.7	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	23.6	24.7	46.7	26.0	35.8	42.2	0.0	12.3	43.7	9.3	9.4
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	A	A
Approach Vol, veh/h		156			219			309			297	
Approach Delay, s/veh		34.8			35.8			15.0			18.8	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	38.9	5.6	18.3	6.6	41.2	8.5	15.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.9	5.3	21.3	8.7	36.7	8.5	18.1
Max Q Clear Time (g_c+I1), s	5.2	8.7	2.5	4.4	3.1	4.3	5.1	10.5
Green Ext Time (p_c), s	0.1	1.5	0.0	0.2	0.0	1.3	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	88	132	11	87	118	125	148	6	132	141	14
Future Vol, veh/h	4	88	132	11	87	118	125	148	6	132	141	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	96	143	12	95	128	136	161	7	143	153	15
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11	11	15	15.3
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	45%	4%	0%	11%	0%	46%
Vol Thru, %	53%	96%	0%	89%	0%	49%
Vol Right, %	2%	0%	100%	0%	100%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	279	92	132	98	118	287
LT Vol	125	4	0	11	0	132
Through Vol	148	88	0	87	0	141
RT Vol	6	0	132	0	118	14
Lane Flow Rate	303	100	143	107	128	312
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.503	0.189	0.242	0.203	0.217	0.515
Departure Headway (Hd)	5.973	6.817	6.078	6.865	6.09	5.944
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	597	522	585	519	584	602
Service Time	4.06	4.616	3.876	4.664	3.889	4.03
HCM Lane V/C Ratio	0.508	0.192	0.244	0.206	0.219	0.518
HCM Control Delay	15	11.2	10.8	11.4	10.6	15.3
HCM Lane LOS	B	B	B	B	B	C
HCM 95th-tile Q	2.8	0.7	0.9	0.8	0.8	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	7	4	15	64	78	0	18	37	4	25	0
Future Volume (veh/h)	0	7	4	15	64	78	0	18	37	4	25	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	8	4	16	70	85	0	20	40	4	27	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	115	58	106	155	155	0	350	700	10	1354	0
Arrive On Green	0.00	0.10	0.10	0.10	0.10	0.10	0.00	0.63	0.63	0.01	0.72	0.00
Sat Flow, veh/h	0	1176	588	218	1579	1585	0	557	1113	1781	1870	0
Grp Volume(v), veh/h	0	0	12	86	0	85	0	0	60	4	27	0
Grp Sat Flow(s),veh/h/ln	0	0	1764	1798	0	1585	0	0	1670	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.3	0.6	0.0	2.6	0.0	0.0	0.7	0.1	0.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.3	2.2	0.0	2.6	0.0	0.0	0.7	0.1	0.2	0.0
Prop In Lane	0.00		0.33	0.19		1.00	0.00		0.67	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	173	261	0	155	0	0	1050	10	1354	0
V/C Ratio(X)	0.00	0.00	0.07	0.33	0.00	0.55	0.00	0.00	0.06	0.42	0.02	0.00
Avail Cap(c_a), veh/h	0	0	1557	1642	0	1398	0	0	1050	265	1354	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	20.7	21.5	0.0	21.7	0.0	0.0	3.6	25.0	2.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.7	0.0	3.0	0.0	0.0	0.1	26.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.9	0.0	1.0	0.0	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	20.8	22.2	0.0	24.7	0.0	0.0	3.7	51.1	2.0	0.0
LnGrp LOS	A	A	C	C	A	C	A	A	A	D	A	A
Approach Vol, veh/h		12			171			60			31	
Approach Delay, s/veh		20.8			23.5			3.7			8.3	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.8	36.2		9.4		41.0		9.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	7.5	24.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.1	2.7		2.3		2.2		4.6				
Green Ext Time (p_c), s	0.0	0.2		0.0		0.1		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	1	8	17	7	10
Future Vol, veh/h	17	1	8	17	7	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	1	9	18	8	11
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.3	7.2	6.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	32%	94%	0%
Vol Thru, %	68%	0%	41%
Vol Right, %	0%	6%	59%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	25	18	17
LT Vol	8	17	0
Through Vol	17	0	7
RT Vol	0	1	10
Lane Flow Rate	27	20	18
Geometry Grp	1	1	1
Degree of Util (X)	0.031	0.023	0.019
Departure Headway (Hd)	4.045	4.168	3.635
Convergence, Y/N	Yes	Yes	Yes
Cap	887	860	986
Service Time	2.059	2.187	1.652
HCM Lane V/C Ratio	0.03	0.023	0.018
HCM Control Delay	7.2	7.3	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	17	21	0	38	24	0	1064	1	10	791	32
Future Volume (veh/h)	44	17	21	0	38	24	0	1064	1	10	791	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	18	23	0	41	26	0	1157	1	11	860	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	264	394	2	97	82	4	2532	2	24	2696	1202
Arrive On Green	0.04	0.14	0.14	0.00	0.05	0.05	0.00	0.69	0.69	0.01	0.76	0.76
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3643	3	1781	3554	1585
Grp Volume(v), veh/h	48	18	23	0	41	26	0	564	594	11	860	35
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	1870	1781	1777	1585
Q Serve(g_s), s	2.4	0.7	0.6	0.0	1.9	1.4	0.0	12.7	12.7	0.5	6.9	0.5
Cycle Q Clear(g_c), s	2.4	0.7	0.6	0.0	1.9	1.4	0.0	12.7	12.7	0.5	6.9	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	69	264	394	2	97	82	4	1235	1299	24	2696	1202
V/C Ratio(X)	0.69	0.07	0.06	0.00	0.42	0.32	0.00	0.46	0.46	0.46	0.32	0.03
Avail Cap(c_a), veh/h	99	376	560	99	376	318	193	1235	1299	133	2696	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	33.4	33.3	0.0	41.2	41.0	0.0	6.1	6.1	43.9	3.4	2.7
Incr Delay (d2), s/veh	11.7	0.1	0.1	0.0	2.9	2.2	0.0	1.2	1.2	13.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.3	0.2	0.0	0.9	0.6	0.0	4.3	4.5	0.3	1.9	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	33.5	33.4	0.0	44.1	43.1	0.0	7.3	7.3	57.2	3.8	2.7
LnGrp LOS	D	C	C	A	D	D	A	A	A	E	A	A
Approach Vol, veh/h		89			67			1158			906	
Approach Delay, s/veh		44.7			43.7			7.3			4.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	66.8	0.0	17.1	0.0	72.5	8.0	9.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	62.3	5.0	18.0	5.0	64.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.5	14.7	0.0	2.7	0.0	8.9	4.4	3.9
Green Ext Time (p_c), s	0.0	10.3	0.0	0.1	0.0	7.8	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	41	24	22	49	85	120	934	34	42	696	36
Future Volume (veh/h)	32	41	24	22	49	85	120	934	34	42	696	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	45	26	24	53	92	130	1015	37	46	757	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	73	34	85	143	161	160	2535	92	65	2308	119
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.72	0.72	0.04	0.67	0.67
Sat Flow, veh/h	315	720	336	366	1408	1585	1781	3497	127	1781	3438	177
Grp Volume(v), veh/h	106	0	0	77	0	92	130	516	536	46	391	405
Grp Sat Flow(s),veh/h/ln	1371	0	0	1774	0	1585	1781	1777	1847	1781	1777	1838
Q Serve(g_s), s	3.9	0.0	0.0	0.0	0.0	5.5	7.1	11.1	11.1	2.5	9.1	9.1
Cycle Q Clear(g_c), s	7.7	0.0	0.0	3.8	0.0	5.5	7.1	11.1	11.1	2.5	9.1	9.1
Prop In Lane	0.33		0.25	0.31		1.00	1.00		0.07	1.00		0.10
Lane Grp Cap(c), veh/h	188	0	0	228	0	161	160	1288	1339	65	1193	1234
V/C Ratio(X)	0.56	0.00	0.00	0.34	0.00	0.57	0.81	0.40	0.40	0.71	0.33	0.33
Avail Cap(c_a), veh/h	321	0	0	371	0	298	215	1288	1339	273	1193	1234
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	0.0	0.0	41.4	0.0	42.2	44.0	5.2	5.3	46.9	6.8	6.8
Incr Delay (d2), s/veh	2.6	0.0	0.0	0.9	0.0	3.2	15.4	0.9	0.9	13.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	1.8	0.0	2.3	3.8	3.7	3.8	1.3	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	0.0	0.0	42.3	0.0	45.3	59.4	6.2	6.1	60.3	7.6	7.5
LnGrp LOS	D	A	A	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		106			169			1182			842	
Approach Delay, s/veh		45.9			44.0			12.0			10.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	75.9		14.5	13.4	70.6		14.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.1	62.9		18.5	11.9	66.1		18.5				
Max Q Clear Time (g_c+I1), s	4.5	13.1		9.7	9.1	11.1		7.5				
Green Ext Time (p_c), s	0.0	8.9		0.3	0.1	6.0		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	181	7	6	193	15	18	0	17	45	0	11
Future Volume (veh/h)	4	181	7	6	193	15	18	0	17	45	0	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	197	8	7	210	16	20	0	18	49	0	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	309	13	16	304	23	43	0	673	87	0	712
Arrive On Green	0.01	0.17	0.17	0.01	0.18	0.18	0.02	0.00	0.42	0.05	0.00	0.45
Sat Flow, veh/h	1781	1785	72	1781	1716	131	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	4	0	205	7	0	226	20	0	18	49	0	12
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	0	1847	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.1	0.0	5.4	0.2	0.0	6.0	0.6	0.0	0.3	1.4	0.0	0.2
Cycle Q Clear(g_c), s	0.1	0.0	5.4	0.2	0.0	6.0	0.6	0.0	0.3	1.4	0.0	0.2
Prop In Lane	1.00		0.04	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	10	0	322	16	0	327	43	0	673	87	0	712
V/C Ratio(X)	0.42	0.00	0.64	0.43	0.00	0.69	0.47	0.00	0.03	0.56	0.00	0.02
Avail Cap(c_a), veh/h	255	0	1119	255	0	1112	324	0	673	392	0	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	20.1	25.8	0.0	20.2	25.2	0.0	8.8	24.3	0.0	8.0
Incr Delay (d2), s/veh	26.2	0.0	2.1	16.4	0.0	2.6	7.7	0.0	0.1	5.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.3	0.2	0.0	2.6	0.3	0.0	0.1	0.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	22.2	42.2	0.0	22.8	32.8	0.0	8.8	30.0	0.0	8.0
LnGrp LOS	D	A	C	D	A	C	C	A	A	C	A	A
Approach Vol, veh/h		209			233			38			61	
Approach Delay, s/veh		22.8			23.4			21.5			25.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	26.7	5.0	13.6	5.8	28.0	4.8	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	21.5	7.5	31.5	9.5	23.5	7.5	31.5
Max Q Clear Time (g_c+I1), s	3.4	2.3	2.2	7.4	2.6	2.2	2.1	8.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	22	24	16	15	140	49	287	12	188	465	118
Future Volume (veh/h)	73	22	24	16	15	140	49	287	12	188	465	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	24	26	17	16	152	53	312	13	204	505	128
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	303	257	36	233	198	81	753	31	252	1457	367
Arrive On Green	0.06	0.16	0.16	0.02	0.12	0.12	0.05	0.42	0.42	0.14	0.52	0.52
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1783	74	1781	2811	709
Grp Volume(v), veh/h	79	24	26	17	16	152	53	0	325	204	318	315
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1857	1781	1777	1743
Q Serve(g_s), s	3.1	0.8	1.0	0.7	0.5	6.6	2.1	0.0	8.7	7.9	7.4	7.5
Cycle Q Clear(g_c), s	3.1	0.8	1.0	0.7	0.5	6.6	2.1	0.0	8.7	7.9	7.4	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.41
Lane Grp Cap(c), veh/h	102	303	257	36	233	198	81	0	784	252	921	903
V/C Ratio(X)	0.77	0.08	0.10	0.48	0.07	0.77	0.65	0.00	0.41	0.81	0.35	0.35
Avail Cap(c_a), veh/h	214	562	477	133	478	405	219	0	784	465	921	903
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	25.2	25.3	34.3	27.4	30.0	33.2	0.0	14.3	29.5	10.0	10.0
Incr Delay (d2), s/veh	11.8	0.1	0.2	9.5	0.1	6.2	8.5	0.0	1.6	6.1	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.3	0.4	0.4	0.2	2.7	1.1	0.0	3.7	3.6	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	25.3	25.5	43.8	27.5	36.2	41.7	0.0	15.9	35.5	11.0	11.1
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	B	B
Approach Vol, veh/h		129			185			378			837	
Approach Delay, s/veh		37.2			36.1			19.6			17.0	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	34.4	5.9	16.0	7.7	41.2	8.6	13.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.9	5.3	21.3	8.7	36.7	8.5	18.1
Max Q Clear Time (g_c+I1), s	9.9	10.7	2.7	3.0	4.1	9.5	5.1	8.6
Green Ext Time (p_c), s	0.4	1.7	0.0	0.1	0.0	4.3	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	37.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	122	272	8	73	132	101	211	14	125	318	7
Future Vol, veh/h	20	122	272	8	73	132	101	211	14	125	318	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	133	296	9	79	143	110	229	15	136	346	8
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	20	14.7	31.4	69.8
HCM LOS	C	B	D	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	31%	14%	0%	10%	0%	28%
Vol Thru, %	65%	86%	0%	90%	0%	71%
Vol Right, %	4%	0%	100%	0%	100%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	326	142	272	81	132	450
LT Vol	101	20	0	8	0	125
Through Vol	211	122	0	73	0	318
RT Vol	14	0	272	0	132	7
Lane Flow Rate	354	154	296	88	143	489
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.757	0.357	0.62	0.217	0.323	1.006
Departure Headway (Hd)	7.844	8.507	7.705	9.058	8.273	7.401
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	464	426	473	399	438	494
Service Time	5.844	6.207	5.405	6.758	5.973	5.422
HCM Lane V/C Ratio	0.763	0.362	0.626	0.221	0.326	0.99
HCM Control Delay	31.4	15.9	22.2	14.3	14.9	69.8
HCM Lane LOS	D	C	C	B	B	F
HCM 95th-tile Q	6.4	1.6	4.1	0.8	1.4	13.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	24	1	44	28	130	1	15	26	1	41	4
Future Volume (veh/h)	183	24	1	44	28	130	1	15	26	1	41	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	199	26	1	48	30	141	1	16	28	1	45	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	356	40	1	336	189	401	64	329	547	3	1014	90
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.52	0.52	0.52	0.00	0.60	0.60
Sat Flow, veh/h	968	159	5	950	745	1585	6	628	1045	1781	1693	150
Grp Volume(v), veh/h	226	0	0	78	0	141	45	0	0	1	0	49
Grp Sat Flow(s),veh/h/ln	1132	0	0	1696	0	1585	1680	0	0	1781	0	1843
Q Serve(g_s), s	9.8	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.7
Cycle Q Clear(g_c), s	11.9	0.0	0.0	2.0	0.0	4.4	0.8	0.0	0.0	0.0	0.0	0.7
Prop In Lane	0.88		0.00	0.62		1.00	0.02		0.62	1.00		0.08
Lane Grp Cap(c), veh/h	398	0	0	525	0	401	940	0	0	3	0	1104
V/C Ratio(X)	0.57	0.00	0.00	0.15	0.00	0.35	0.05	0.00	0.00	0.34	0.00	0.04
Avail Cap(c_a), veh/h	1002	0	0	1258	0	1158	940	0	0	219	0	1104
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	0.0	17.7	0.0	18.6	7.1	0.0	0.0	30.4	0.0	5.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.1	0.0	0.5	0.1	0.0	0.0	57.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.8	0.0	1.6	0.3	0.0	0.0	0.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	0.0	0.0	17.9	0.0	19.2	7.2	0.0	0.0	88.2	0.0	5.1
LnGrp LOS	C	A	A	B	A	B	A	A	A	F	A	A
Approach Vol, veh/h		226			219			45			50	
Approach Delay, s/veh		23.4			18.7			7.2			6.8	
Approach LOS		C			B			A			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.6	36.4		19.9		41.0		19.9				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	7.5	24.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.0	2.8		13.9		2.7		6.4				
Green Ext Time (p_c), s	0.0	0.2		1.6		0.2		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	15	22	7	14	36
Future Vol, veh/h	22	15	22	7	14	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	16	24	8	15	39
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	7.4	6.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	76%	59%	0%
Vol Thru, %	24%	0%	28%
Vol Right, %	0%	41%	72%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	29	37	50
LT Vol	22	22	0
Through Vol	7	0	14
RT Vol	0	15	36
Lane Flow Rate	32	40	54
Geometry Grp	1	1	1
Degree of Util (X)	0.037	0.044	0.054
Departure Headway (Hd)	4.198	3.957	3.596
Convergence, Y/N	Yes	Yes	Yes
Cap	854	904	995
Service Time	2.219	1.986	1.62
HCM Lane V/C Ratio	0.037	0.044	0.054
HCM Control Delay	7.4	7.2	6.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	27	185	4	24	3	115	942	0	32	1785	55
Future Volume (veh/h)	23	27	185	4	24	3	115	942	0	32	1785	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	29	201	4	26	3	125	1024	0	35	1940	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	45	181	270	9	144	122	178	2419	0	56	2347	1047
Arrive On Green	0.03	0.10	0.10	0.01	0.08	0.08	0.05	0.68	0.00	0.03	0.66	0.66
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3647	0	1781	3554	1585
Grp Volume(v), veh/h	25	29	201	4	26	3	125	1024	0	35	1940	60
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	0	1781	1777	1585
Q Serve(g_s), s	1.3	1.4	6.8	0.2	1.3	0.2	3.4	12.5	0.0	1.9	39.5	1.3
Cycle Q Clear(g_c), s	1.3	1.4	6.8	0.2	1.3	0.2	3.4	12.5	0.0	1.9	39.5	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	45	181	270	9	144	122	178	2419	0	56	2347	1047
V/C Ratio(X)	0.56	0.16	0.74	0.43	0.18	0.02	0.70	0.42	0.00	0.62	0.83	0.06
Avail Cap(c_a), veh/h	92	347	518	92	347	294	178	2419	0	123	2347	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	40.1	42.6	48.0	41.9	41.4	45.2	6.9	0.0	46.4	12.3	5.8
Incr Delay (d2), s/veh	10.3	0.4	4.0	27.8	0.6	0.1	11.6	0.5	0.0	10.8	3.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.7	2.5	0.2	0.6	0.1	1.8	4.3	0.0	1.0	14.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	40.6	46.6	75.9	42.5	41.4	56.8	7.5	0.0	57.2	15.8	5.9
LnGrp LOS	E	D	D	E	D	D	E	A	A	E	B	A
Approach Vol, veh/h		255			33			1149			2035	
Approach Delay, s/veh		47.0			46.4			12.8			16.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	70.4	5.0	13.9	9.5	68.5	6.9	11.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	62.3	5.0	18.0	5.0	64.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.9	14.5	2.2	8.8	5.4	41.5	3.3	3.3
Green Ext Time (p_c), s	0.0	9.7	0.0	0.6	0.0	16.7	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	53	16	88	69	63	146	876	41	99	1735	32
Future Volume (veh/h)	32	53	16	88	69	63	146	876	41	99	1735	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	58	17	96	75	68	159	952	45	108	1886	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	43	58	11	139	82	267	187	2184	103	135	2152	40
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.11	0.63	0.63	0.08	0.60	0.60
Sat Flow, veh/h	0	346	63	520	483	1585	1781	3455	163	1781	3569	66
Grp Volume(v), veh/h	110	0	0	171	0	68	159	490	507	108	936	985
Grp Sat Flow(s),veh/h/ln	409	0	0	1003	0	1585	1781	1777	1841	1781	1777	1858
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.1	9.6	15.3	15.3	6.5	48.5	49.1
Cycle Q Clear(g_c), s	18.5	0.0	0.0	18.5	0.0	4.1	9.6	15.3	15.3	6.5	48.5	49.1
Prop In Lane	0.32		0.15	0.56		1.00	1.00		0.09	1.00		0.04
Lane Grp Cap(c), veh/h	112	0	0	221	0	267	187	1123	1164	135	1071	1120
V/C Ratio(X)	0.98	0.00	0.00	0.78	0.00	0.25	0.85	0.44	0.44	0.80	0.87	0.88
Avail Cap(c_a), veh/h	112	0	0	221	0	267	193	1123	1164	245	1071	1120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	0.0	0.0	45.3	0.0	39.6	48.2	10.2	10.2	49.8	18.3	18.4
Incr Delay (d2), s/veh	78.0	0.0	0.0	15.8	0.0	0.5	27.6	1.2	1.2	10.2	9.9	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.0	5.6	0.0	1.6	5.7	6.0	6.2	3.3	21.2	22.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.5	0.0	0.0	61.1	0.0	40.1	75.8	11.5	11.4	60.0	28.2	28.3
LnGrp LOS	F	A	A	E	A	D	E	B	B	E	C	C
Approach Vol, veh/h		110			239			1156			2029	
Approach Delay, s/veh		122.5			55.1			20.3			29.9	
Approach LOS		F			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.8	73.8		23.0	16.0	70.6		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.1	62.9		18.5	11.9	66.1		18.5				
Max Q Clear Time (g_c+I1), s	8.5	17.3		20.5	11.6	51.1		20.5				
Green Ext Time (p_c), s	0.1	8.2		0.0	0.0	11.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			31.4									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	189	18	17	209	48	11	0	10	29	0	7
Future Volume (veh/h)	12	189	18	17	209	48	11	0	10	29	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	205	20	18	227	52	12	0	11	32	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	29	346	34	39	312	71	27	0	634	63	0	666
Arrive On Green	0.02	0.21	0.21	0.02	0.21	0.21	0.02	0.00	0.40	0.04	0.00	0.42
Sat Flow, veh/h	1781	1677	164	1781	1472	337	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	13	0	225	18	0	279	12	0	11	32	0	8
Grp Sat Flow(s),veh/h/ln	1781	0	1841	1781	0	1810	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.4	0.0	5.9	0.5	0.0	7.7	0.4	0.0	0.2	0.9	0.0	0.2
Cycle Q Clear(g_c), s	0.4	0.0	5.9	0.5	0.0	7.7	0.4	0.0	0.2	0.9	0.0	0.2
Prop In Lane	1.00		0.09	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	29	0	380	39	0	383	27	0	634	63	0	666
V/C Ratio(X)	0.44	0.00	0.59	0.46	0.00	0.73	0.44	0.00	0.02	0.51	0.00	0.01
Avail Cap(c_a), veh/h	316	0	1118	316	0	1099	250	0	634	316	0	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	19.2	25.9	0.0	19.7	26.1	0.0	9.7	25.4	0.0	9.0
Incr Delay (d2), s/veh	10.2	0.0	1.5	8.2	0.0	2.7	10.8	0.0	0.1	6.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.4	0.3	0.0	3.2	0.2	0.0	0.1	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	0.0	20.7	34.1	0.0	22.3	37.0	0.0	9.7	31.6	0.0	9.1
LnGrp LOS	D	A	C	C	A	C	D	A	A	C	A	A
Approach Vol, veh/h		238			297			23			40	
Approach Delay, s/veh		21.5			23.0			23.9			27.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	25.9	5.7	15.5	5.3	27.0	5.4	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	20.5	9.5	32.5	7.5	22.5	9.5	32.5
Max Q Clear Time (g_c+I1), s	2.9	2.2	2.5	7.9	2.4	2.2	2.4	9.7
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C

APPENDIX D

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS – EXISTING + PROJECT + CUMULATIVE PROJECTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	16	66	12	12	195	28	270	20	82	188	32
Future Volume (veh/h)	80	16	66	12	12	195	28	270	20	82	188	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	17	72	13	13	212	30	293	22	89	204	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	391	331	28	303	256	55	798	60	117	1518	256
Arrive On Green	0.06	0.21	0.21	0.02	0.16	0.16	0.03	0.46	0.46	0.07	0.50	0.50
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1718	129	1781	3042	513
Grp Volume(v), veh/h	87	17	72	13	13	212	30	0	315	89	118	121
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1847	1781	1777	1778
Q Serve(g_s), s	3.5	0.5	2.8	0.5	0.4	9.5	1.2	0.0	8.1	3.6	2.6	2.7
Cycle Q Clear(g_c), s	3.5	0.5	2.8	0.5	0.4	9.5	1.2	0.0	8.1	3.6	2.6	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.29
Lane Grp Cap(c), veh/h	112	391	331	28	303	256	55	0	858	117	887	887
V/C Ratio(X)	0.77	0.04	0.22	0.46	0.04	0.83	0.54	0.00	0.37	0.76	0.13	0.14
Avail Cap(c_a), veh/h	206	542	459	128	460	390	211	0	858	448	887	887
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	23.2	24.1	35.9	26.0	29.8	35.1	0.0	12.7	33.8	9.9	9.9
Incr Delay (d2), s/veh	10.8	0.0	0.3	11.2	0.1	8.6	7.9	0.0	1.2	9.7	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.2	1.0	0.3	0.2	4.1	0.6	0.0	3.3	1.8	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	23.3	24.4	47.1	26.1	38.4	43.0	0.0	13.9	43.5	10.2	10.2
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	B	B
Approach Vol, veh/h		176			238			345			328	
Approach Delay, s/veh		34.3			38.2			16.4			19.2	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	38.7	5.7	19.9	6.8	41.2	9.1	16.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.9	5.3	21.3	8.7	36.7	8.5	18.1
Max Q Clear Time (g_c+I1), s	5.6	10.1	2.5	4.8	3.2	4.7	5.5	11.5
Green Ext Time (p_c), s	0.1	1.7	0.0	0.2	0.0	1.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	99	148	12	97	132	140	166	7	148	157	16
Future Vol, veh/h	4	99	148	12	97	132	140	166	7	148	157	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	108	161	13	105	143	152	180	8	161	171	17
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	12.2	12.2	19.2	19.5
HCM LOS	B	B	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	45%	4%	0%	11%	0%	46%
Vol Thru, %	53%	96%	0%	89%	0%	49%
Vol Right, %	2%	0%	100%	0%	100%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	313	103	148	109	132	321
LT Vol	140	4	0	12	0	148
Through Vol	166	99	0	97	0	157
RT Vol	7	0	148	0	132	16
Lane Flow Rate	340	112	161	118	143	349
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.61	0.229	0.296	0.244	0.265	0.622
Departure Headway (Hd)	6.454	7.365	6.624	7.421	6.643	6.421
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	487	541	483	539	562
Service Time	4.509	5.126	4.385	5.183	4.405	4.478
HCM Lane V/C Ratio	0.609	0.23	0.298	0.244	0.265	0.621
HCM Control Delay	19.2	12.3	12.2	12.6	11.8	19.5
HCM Lane LOS	C	B	B	B	B	C
HCM 95th-tile Q	4.1	0.9	1.2	0.9	1.1	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	8	4	16	72	87	0	20	40	4	28	0
Future Volume (veh/h)	0	8	4	16	72	87	0	20	40	4	28	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	9	4	17	78	95	0	22	43	4	30	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	131	58	105	171	169	0	352	689	10	1340	0
Arrive On Green	0.00	0.11	0.11	0.11	0.11	0.11	0.00	0.62	0.62	0.01	0.72	0.00
Sat Flow, veh/h	0	1227	545	202	1601	1585	0	566	1106	1781	1870	0
Grp Volume(v), veh/h	0	0	13	95	0	95	0	0	65	4	30	0
Grp Sat Flow(s),veh/h/ln	0	0	1772	1803	0	1585	0	0	1671	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.3	0.5	0.0	2.9	0.0	0.0	0.8	0.1	0.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.3	2.5	0.0	2.9	0.0	0.0	0.8	0.1	0.2	0.0
Prop In Lane	0.00		0.31	0.18		1.00	0.00		0.66	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	189	276	0	169	0	0	1041	10	1340	0
V/C Ratio(X)	0.00	0.00	0.07	0.34	0.00	0.56	0.00	0.00	0.06	0.42	0.02	0.00
Avail Cap(c_a), veh/h	0	0	1548	1629	0	1385	0	0	1041	262	1340	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	20.5	21.4	0.0	21.6	0.0	0.0	3.8	25.3	2.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.7	0.0	2.9	0.0	0.0	0.1	26.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	1.0	0.0	1.1	0.0	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	20.6	22.2	0.0	24.5	0.0	0.0	3.9	51.4	2.1	0.0
LnGrp LOS	A	A	C	C	A	C	A	A	A	D	A	A
Approach Vol, veh/h		13			190			65			34	
Approach Delay, s/veh		20.6			23.3			3.9			7.9	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.8	36.2		9.9		41.0		9.9				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	7.5	24.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.1	2.8		2.3		2.2		4.9				
Green Ext Time (p_c), s	0.0	0.3		0.0		0.1		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		17.3	
HCM 6th LOS		B	

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	1	8	19	8	11
Future Vol, veh/h	19	1	8	19	8	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	1	9	21	9	12
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.3	7.2	6.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	30%	95%	0%
Vol Thru, %	70%	0%	42%
Vol Right, %	0%	5%	58%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	27	20	19
LT Vol	8	19	0
Through Vol	19	0	8
RT Vol	0	1	11
Lane Flow Rate	29	22	21
Geometry Grp	1	1	1
Degree of Util (X)	0.033	0.025	0.021
Departure Headway (Hd)	4.046	4.18	3.646
Convergence, Y/N	Yes	Yes	Yes
Cap	887	858	983
Service Time	2.06	2.199	1.664
HCM Lane V/C Ratio	0.033	0.026	0.021
HCM Control Delay	7.2	7.3	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	19	24	0	43	27	0	1192	1	11	886	35
Future Volume (veh/h)	48	19	24	0	43	27	0	1192	1	11	886	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	21	26	0	47	29	0	1296	1	12	963	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	268	400	2	99	84	4	2522	2	26	2689	1199
Arrive On Green	0.04	0.14	0.14	0.00	0.05	0.05	0.00	0.69	0.69	0.01	0.76	0.76
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3644	3	1781	3554	1585
Grp Volume(v), veh/h	52	21	26	0	47	29	0	632	665	12	963	38
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	1870	1781	1777	1585
Q Serve(g_s), s	2.6	0.9	0.7	0.0	2.2	1.6	0.0	15.3	15.3	0.6	8.1	0.5
Cycle Q Clear(g_c), s	2.6	0.9	0.7	0.0	2.2	1.6	0.0	15.3	15.3	0.6	8.1	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	72	268	400	2	99	84	4	1230	1294	26	2689	1199
V/C Ratio(X)	0.72	0.08	0.06	0.00	0.47	0.35	0.00	0.51	0.51	0.47	0.36	0.03
Avail Cap(c_a), veh/h	99	374	558	99	374	317	192	1230	1294	133	2689	1199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	33.4	33.3	0.0	41.4	41.1	0.0	6.6	6.6	44.0	3.7	2.7
Incr Delay (d2), s/veh	14.9	0.1	0.1	0.0	3.5	2.4	0.0	1.5	1.5	12.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.4	0.2	0.0	1.1	0.7	0.0	5.3	5.5	0.4	2.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	33.5	33.4	0.0	44.9	43.5	0.0	8.2	8.1	56.7	4.0	2.8
LnGrp LOS	E	C	C	A	D	D	A	A	A	E	A	A
Approach Vol, veh/h		99			76			1297			1013	
Approach Delay, s/veh		46.1			44.4			8.1			4.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	66.8	0.0	17.4	0.0	72.6	8.1	9.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	62.3	5.0	18.0	5.0	64.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.6	17.3	0.0	2.9	0.0	10.1	4.6	4.2
Green Ext Time (p_c), s	0.0	12.4	0.0	0.1	0.0	9.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	46	24	25	55	95	134	1046	38	47	780	40
Future Volume (veh/h)	36	46	24	25	55	95	134	1046	38	47	780	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	50	26	27	60	103	146	1137	41	51	848	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	83	79	33	87	153	176	177	2509	90	67	2256	114
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.72	0.72	0.04	0.66	0.66
Sat Flow, veh/h	312	712	299	359	1372	1585	1781	3498	126	1781	3441	174
Grp Volume(v), veh/h	115	0	0	87	0	103	146	577	601	51	438	453
Grp Sat Flow(s),veh/h/ln	1323	0	0	1731	0	1585	1781	1777	1848	1781	1777	1839
Q Serve(g_s), s	4.4	0.0	0.0	0.0	0.0	6.2	8.1	13.7	13.7	2.9	11.3	11.4
Cycle Q Clear(g_c), s	8.9	0.0	0.0	4.5	0.0	6.2	8.1	13.7	13.7	2.9	11.3	11.4
Prop In Lane	0.34		0.23	0.31		1.00	1.00		0.07	1.00		0.09
Lane Grp Cap(c), veh/h	195	0	0	239	0	176	177	1274	1325	67	1165	1206
V/C Ratio(X)	0.59	0.00	0.00	0.36	0.00	0.58	0.83	0.45	0.45	0.76	0.38	0.38
Avail Cap(c_a), veh/h	306	0	0	359	0	291	210	1274	1325	267	1165	1206
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	0.0	0.0	41.8	0.0	42.6	44.6	6.0	6.0	48.1	7.9	7.9
Incr Delay (d2), s/veh	2.8	0.0	0.0	0.9	0.0	3.1	20.1	1.2	1.1	15.9	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	2.1	0.0	2.6	4.5	4.7	4.9	1.6	4.2	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	0.0	0.0	42.7	0.0	45.6	64.6	7.1	7.1	64.0	8.9	8.8
LnGrp LOS	D	A	A	D	A	D	E	A	A	E	A	A
Approach Vol, veh/h		115			190			1324			942	
Approach Delay, s/veh		46.7			44.3			13.5			11.8	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	76.8		15.7	14.5	70.6		15.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.1	62.9		18.5	11.9	66.1		18.5				
Max Q Clear Time (g_c+I1), s	4.9	15.7		10.9	10.1	13.4		8.2				
Green Ext Time (p_c), s	0.1	10.7		0.3	0.1	7.0		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	203	8	7	216	15	20	0	19	45	0	11
Future Volume (veh/h)	4	203	8	7	216	15	20	0	19	45	0	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	4	221	9	8	235	16	22	0	21	49	0	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	10	332	14	19	331	23	46	0	662	86	0	698
Arrive On Green	0.01	0.19	0.19	0.01	0.19	0.19	0.03	0.00	0.42	0.05	0.00	0.44
Sat Flow, veh/h	1781	1785	73	1781	1731	118	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	4	0	230	8	0	251	22	0	21	49	0	12
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	0	1849	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.1	0.0	6.1	0.2	0.0	6.8	0.7	0.0	0.4	1.4	0.0	0.2
Cycle Q Clear(g_c), s	0.1	0.0	6.1	0.2	0.0	6.8	0.7	0.0	0.4	1.4	0.0	0.2
Prop In Lane	1.00		0.04	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	10	0	345	19	0	353	46	0	662	86	0	698
V/C Ratio(X)	0.42	0.00	0.67	0.43	0.00	0.71	0.47	0.00	0.03	0.57	0.00	0.02
Avail Cap(c_a), veh/h	250	0	1096	250	0	1091	317	0	662	384	0	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	20.2	26.3	0.0	20.2	25.6	0.0	9.2	24.9	0.0	8.4
Incr Delay (d2), s/veh	26.2	0.0	2.2	14.8	0.0	2.6	7.3	0.0	0.1	5.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.6	0.2	0.0	2.9	0.4	0.0	0.1	0.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	0.0	22.4	41.0	0.0	22.9	32.9	0.0	9.3	30.6	0.0	8.5
LnGrp LOS	D	A	C	D	A	C	C	A	A	C	A	A
Approach Vol, veh/h		234			259			43			61	
Approach Delay, s/veh		22.9			23.4			21.4			26.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	26.8	5.1	14.4	5.9	28.0	4.8	14.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	21.5	7.5	31.5	9.5	23.5	7.5	31.5
Max Q Clear Time (g_c+I1), s	3.4	2.4	2.2	8.1	2.7	2.2	2.1	8.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	25	27	18	17	153	55	321	13	205	521	132
Future Volume (veh/h)	82	25	27	18	17	153	55	321	13	205	521	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	27	29	20	18	166	60	349	14	223	566	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	327	277	41	249	211	86	717	29	271	1422	358
Arrive On Green	0.06	0.17	0.17	0.02	0.13	0.13	0.05	0.40	0.40	0.15	0.51	0.51
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1786	72	1781	2812	708
Grp Volume(v), veh/h	89	27	29	20	18	166	60	0	363	223	357	352
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	0	1857	1781	1777	1743
Q Serve(g_s), s	3.6	0.9	1.1	0.8	0.6	7.4	2.4	0.0	10.5	8.8	9.0	9.1
Cycle Q Clear(g_c), s	3.6	0.9	1.1	0.8	0.6	7.4	2.4	0.0	10.5	8.8	9.0	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.41
Lane Grp Cap(c), veh/h	115	327	277	41	249	211	86	0	746	271	899	881
V/C Ratio(X)	0.77	0.08	0.10	0.49	0.07	0.79	0.70	0.00	0.49	0.82	0.40	0.40
Avail Cap(c_a), veh/h	209	549	465	130	467	395	214	0	746	454	899	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	25.1	25.2	35.0	27.5	30.4	34.0	0.0	16.1	29.8	11.1	11.1
Incr Delay (d2), s/veh	10.5	0.1	0.2	8.9	0.1	6.3	9.7	0.0	2.3	6.1	1.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.4	0.4	0.4	0.3	3.1	1.2	0.0	4.6	4.1	3.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	25.2	25.3	43.9	27.6	36.8	43.7	0.0	18.4	35.9	12.4	12.5
LnGrp LOS	D	C	C	D	C	D	D	A	B	D	B	B
Approach Vol, veh/h		145			204			423			932	
Approach Delay, s/veh		36.7			36.7			22.0			18.1	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	33.7	6.2	17.2	8.0	41.2	9.2	14.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	26.9	5.3	21.3	8.7	36.7	8.5	18.1
Max Q Clear Time (g_c+I1), s	10.8	12.5	2.8	3.1	4.4	11.1	5.6	9.4
Green Ext Time (p_c), s	0.4	1.9	0.0	0.1	0.0	4.8	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	65.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	137	305	9	82	148	113	236	16	140	356	8
Future Vol, veh/h	22	137	305	9	82	148	113	236	16	140	356	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	150	332	10	89	162	124	257	17	152	387	9
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	25.9	16.7	49.5	136.8
HCM LOS	D	C	E	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	31%	14%	0%	10%	0%	28%
Vol Thru, %	65%	86%	0%	90%	0%	71%
Vol Right, %	4%	0%	100%	0%	100%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	159	305	91	148	504
LT Vol	113	22	0	9	0	140
Through Vol	236	137	0	82	0	356
RT Vol	16	0	305	0	148	8
Lane Flow Rate	398	174	332	99	162	548
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.884	0.415	0.719	0.252	0.379	1.203
Departure Headway (Hd)	8.593	9.217	8.41	9.871	9.081	7.906
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	426	394	434	366	398	460
Service Time	6.593	6.917	6.11	7.571	6.781	6
HCM Lane V/C Ratio	0.934	0.442	0.765	0.27	0.407	1.191
HCM Control Delay	49.5	18.3	29.9	15.9	17.2	136.8
HCM Lane LOS	E	C	D	C	C	F
HCM 95th-tile Q	9.1	2	5.6	1	1.7	21.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	27	1	48	31	146	1	17	28	1	46	4
Future Volume (veh/h)	205	27	1	48	31	146	1	17	28	1	46	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	223	29	1	52	34	159	1	18	30	1	50	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	43	1	356	212	445	61	327	520	3	986	79
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.50	0.50	0.50	0.00	0.58	0.58
Sat Flow, veh/h	956	152	4	945	755	1585	5	647	1030	1781	1709	137
Grp Volume(v), veh/h	253	0	0	86	0	159	49	0	0	1	0	54
Grp Sat Flow(s),veh/h/ln	1112	0	0	1700	0	1585	1683	0	0	1781	0	1846
Q Serve(g_s), s	11.7	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.8
Cycle Q Clear(g_c), s	14.0	0.0	0.0	2.3	0.0	5.1	0.9	0.0	0.0	0.0	0.0	0.8
Prop In Lane	0.88		0.00	0.60		1.00	0.02		0.61	1.00		0.07
Lane Grp Cap(c), veh/h	419	0	0	568	0	445	907	0	0	3	0	1065
V/C Ratio(X)	0.60	0.00	0.00	0.15	0.00	0.36	0.05	0.00	0.00	0.36	0.00	0.05
Avail Cap(c_a), veh/h	945	0	0	1219	0	1115	907	0	0	211	0	1065
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.2	0.0	0.0	17.2	0.0	18.2	8.0	0.0	0.0	31.5	0.0	5.8
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.0	0.5	0.1	0.0	0.0	62.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	0.9	0.0	1.8	0.3	0.0	0.0	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	0.0	0.0	17.3	0.0	18.7	8.1	0.0	0.0	94.1	0.0	5.9
LnGrp LOS	C	A	A	B	A	B	A	A	A	F	A	A
Approach Vol, veh/h		253			245			49			55	
Approach Delay, s/veh		23.6			18.2			8.1			7.5	
Approach LOS		C			B			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	4.6	36.4		22.2		41.0		22.2				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	7.5	24.5		44.5		36.5		44.5				
Max Q Clear Time (g_c+I1), s	2.0	2.9		16.0		2.8		7.1				
Green Ext Time (p_c), s	0.0	0.2		1.8		0.2		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		18.7	
HCM 6th LOS		B	

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	17	22	8	16	40
Future Vol, veh/h	25	17	22	8	16	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	18	24	9	17	43
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	7.4	6.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	73%	60%	0%
Vol Thru, %	27%	0%	29%
Vol Right, %	0%	40%	71%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	30	42	56
LT Vol	22	25	0
Through Vol	8	0	16
RT Vol	0	17	40
Lane Flow Rate	33	46	61
Geometry Grp	1	1	1
Degree of Util (X)	0.038	0.05	0.061
Departure Headway (Hd)	4.208	3.971	3.611
Convergence, Y/N	Yes	Yes	Yes
Cap	851	900	991
Service Time	2.232	2.002	1.636
HCM Lane V/C Ratio	0.039	0.051	0.062
HCM Control Delay	7.4	7.2	6.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.2	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	30	207	4	27	3	129	1055	0	36	1999	60
Future Volume (veh/h)	25	30	207	4	27	3	129	1055	0	36	1999	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	33	225	4	29	3	140	1147	0	39	2173	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	197	294	9	157	133	177	2388	0	59	2325	1037
Arrive On Green	0.03	0.11	0.11	0.01	0.08	0.08	0.05	0.67	0.00	0.03	0.65	0.65
Sat Flow, veh/h	1781	1870	2790	1781	1870	1585	3456	3647	0	1781	3554	1585
Grp Volume(v), veh/h	27	33	225	4	29	3	140	1147	0	39	2173	65
Grp Sat Flow(s),veh/h/ln	1781	1870	1395	1781	1870	1585	1728	1777	0	1781	1777	1585
Q Serve(g_s), s	1.5	1.6	7.7	0.2	1.4	0.2	3.9	15.3	0.0	2.1	53.2	1.4
Cycle Q Clear(g_c), s	1.5	1.6	7.7	0.2	1.4	0.2	3.9	15.3	0.0	2.1	53.2	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	47	197	294	9	157	133	177	2388	0	59	2325	1037
V/C Ratio(X)	0.57	0.17	0.76	0.43	0.18	0.02	0.79	0.48	0.00	0.66	0.93	0.06
Avail Cap(c_a), veh/h	91	344	513	91	344	292	177	2388	0	122	2325	1037
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	39.8	42.6	48.5	41.7	41.1	45.9	7.8	0.0	46.7	15.1	6.1
Incr Delay (d2), s/veh	10.4	0.4	4.1	27.8	0.6	0.1	21.4	0.7	0.0	11.6	8.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	2.8	0.2	0.7	0.1	2.2	5.3	0.0	1.1	21.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.4	40.2	46.7	76.4	42.2	41.2	67.3	8.5	0.0	58.3	23.6	6.2
LnGrp LOS	E	D	D	E	D	D	E	A	A	E	C	A
Approach Vol, veh/h		285			36			1287			2277	
Approach Delay, s/veh		47.0			45.9			14.9			23.7	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	70.2	5.0	14.8	9.5	68.5	7.1	12.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	62.3	5.0	18.0	5.0	64.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	4.1	17.3	2.2	9.7	5.9	55.2	3.5	3.4
Green Ext Time (p_c), s	0.0	11.4	0.0	0.6	0.0	7.9	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	59	16	99	77	71	161	981	46	111	1943	36
Future Volume (veh/h)	36	59	16	99	77	71	161	981	46	111	1943	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	64	17	108	84	77	175	1066	50	121	2112	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	43	58	9	141	76	267	193	2160	101	150	2145	39
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.11	0.63	0.63	0.08	0.60	0.60
Sat Flow, veh/h	0	342	56	536	449	1585	1781	3456	162	1781	3570	66
Grp Volume(v), veh/h	120	0	0	192	0	77	175	548	568	121	1048	1103
Grp Sat Flow(s),veh/h/ln	399	0	0	984	0	1585	1781	1777	1841	1781	1777	1859
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	4.7	10.7	18.4	18.4	7.3	63.1	64.1
Cycle Q Clear(g_c), s	18.5	0.0	0.0	18.5	0.0	4.7	10.7	18.4	18.4	7.3	63.1	64.1
Prop In Lane	0.32		0.14	0.56		1.00	1.00		0.09	1.00		0.04
Lane Grp Cap(c), veh/h	110	0	0	217	0	267	193	1111	1151	150	1068	1117
V/C Ratio(X)	1.09	0.00	0.00	0.89	0.00	0.29	0.91	0.49	0.49	0.81	0.98	0.99
Avail Cap(c_a), veh/h	110	0	0	217	0	267	193	1111	1151	245	1068	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	0.0	0.0	46.9	0.0	40.0	48.5	11.2	11.2	49.5	21.4	21.6
Incr Delay (d2), s/veh	110.9	0.0	0.0	32.5	0.0	0.6	40.1	1.6	1.5	9.9	23.4	24.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	0.0	7.3	0.0	1.9	6.9	7.3	7.5	3.7	30.8	32.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	155.9	0.0	0.0	79.4	0.0	40.6	88.6	12.7	12.7	59.4	44.8	45.7
LnGrp LOS	F	A	A	E	A	D	F	B	B	E	D	D
Approach Vol, veh/h		120			269			1291			2272	
Approach Delay, s/veh		155.9			68.3			23.0			46.0	
Approach LOS		F			E			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.7	73.3		23.0	16.4	70.6		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.1	62.9		18.5	11.9	66.1		18.5				
Max Q Clear Time (g_c+I1), s	9.3	20.4		20.5	12.7	66.1		20.5				
Green Ext Time (p_c), s	0.1	9.6		0.0	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		43.3	
HCM 6th LOS		D	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	212	20	19	234	48	12	0	11	29	0	7
Future Volume (veh/h)	12	212	20	19	234	48	12	0	11	29	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	230	22	21	254	52	13	0	12	32	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	29	367	35	44	342	70	29	0	622	63	0	652
Arrive On Green	0.02	0.22	0.22	0.02	0.23	0.23	0.02	0.00	0.39	0.04	0.00	0.41
Sat Flow, veh/h	1781	1681	161	1781	1506	308	1781	0	1585	1781	0	1585
Grp Volume(v), veh/h	13	0	252	21	0	306	13	0	12	32	0	8
Grp Sat Flow(s),veh/h/ln	1781	0	1841	1781	0	1815	1781	0	1585	1781	0	1585
Q Serve(g_s), s	0.4	0.0	6.8	0.6	0.0	8.6	0.4	0.0	0.3	1.0	0.0	0.2
Cycle Q Clear(g_c), s	0.4	0.0	6.8	0.6	0.0	8.6	0.4	0.0	0.3	1.0	0.0	0.2
Prop In Lane	1.00		0.09	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	29	0	403	44	0	412	29	0	622	63	0	652
V/C Ratio(X)	0.45	0.00	0.63	0.47	0.00	0.74	0.45	0.00	0.02	0.51	0.00	0.01
Avail Cap(c_a), veh/h	244	0	1127	277	0	1144	244	0	622	309	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	19.4	26.3	0.0	19.7	26.7	0.0	10.2	25.9	0.0	9.5
Incr Delay (d2), s/veh	10.3	0.0	1.6	7.6	0.0	2.7	10.3	0.0	0.1	6.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.8	0.3	0.0	3.6	0.2	0.0	0.1	0.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	21.0	33.9	0.0	22.3	37.0	0.0	10.2	32.2	0.0	9.6
LnGrp LOS	D	A	C	C	A	C	D	A	B	C	A	A
Approach Vol, veh/h		265			327			25			40	
Approach Delay, s/veh		21.7			23.1			24.1			27.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	26.0	5.9	16.5	5.4	27.0	5.4	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	20.5	8.5	33.5	7.5	22.5	7.5	34.5
Max Q Clear Time (g_c+I1), s	3.0	2.3	2.6	8.8	2.4	2.2	2.4	10.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.0	0.0	0.0	1.9

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

LINSCOTT
LAW &
GREENSPAN
engineers

INTERSECTION CONTROL EVALUATION

SR 86 / PITZER ROAD

Imperial County, California
March 31, 2021

LLG Ref. 3-20-3289

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SR 86 / PITZER ROAD

Imperial County, California
March 31, 2021

1.0 INTRODUCTION

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following report to detail our assessment, findings, and conclusions of the Intersection Control Evaluation (ICE) at the intersection of SR 86 / Pitzer Road intersection in Imperial County, a Caltrans-controlled intersection located in Imperial County.

LLG conducted an ICE analysis to objectively evaluate and screen intersection control alternatives at the subject intersection. The intersection traffic control options which were assessed are minor-street stop, all-way stop, signalization, and roundabout control. The intersection control alternatives were analyzed using Year 2040 (Horizon Year) forecast traffic volumes including traffic generated by the planned Heber Meadows project.

Figure 1-1 depicts the proposed Heber Meadows project. ***Figure 1-2*** depicts the Vicinity Map and ***Figure 1-3*** depicts the Project Area.

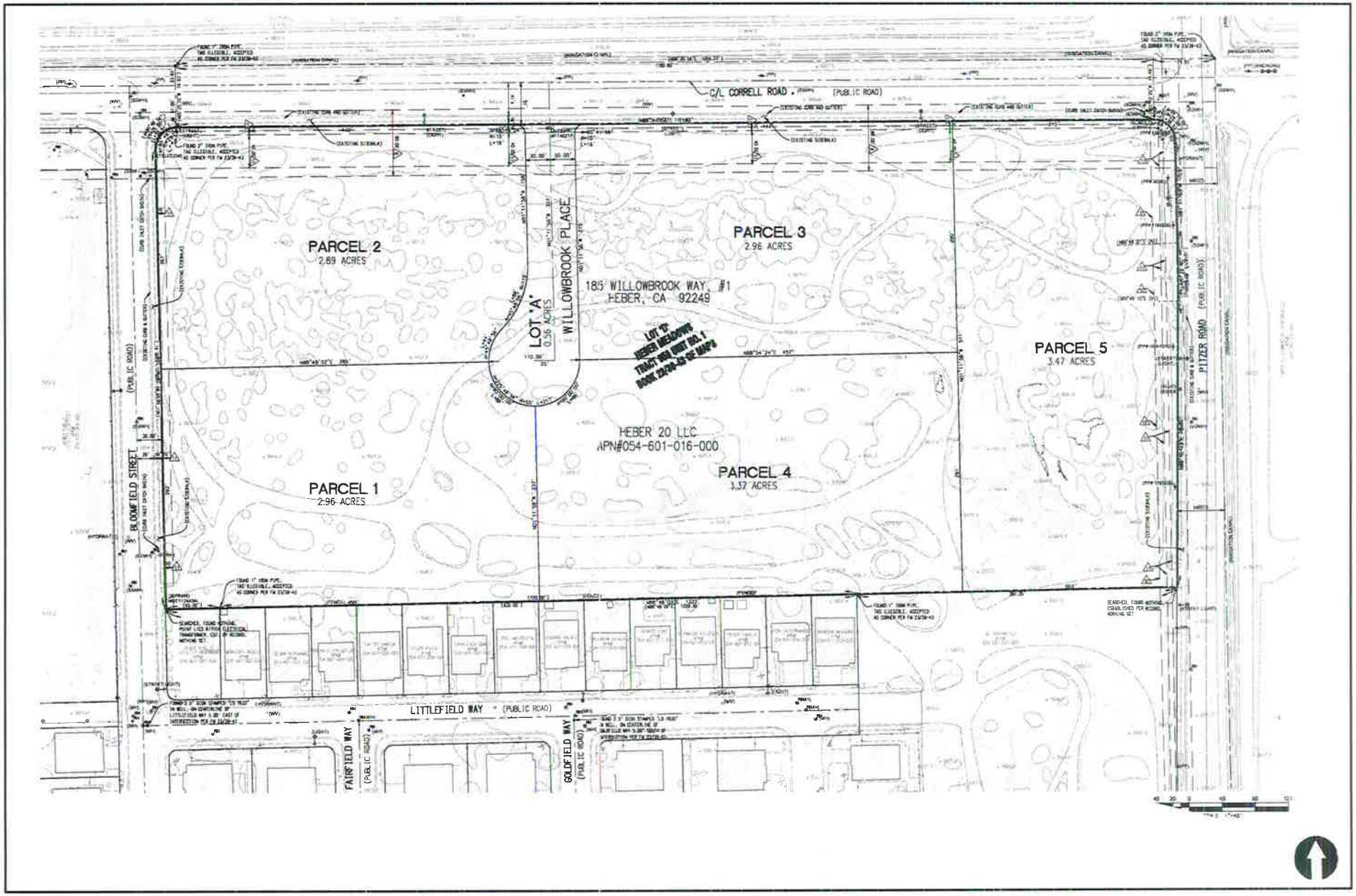

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Figure 1-1

Heber Meadows Site Plan

SR-86 / Pitzer Road Intersection Control Evaluation (ICE)

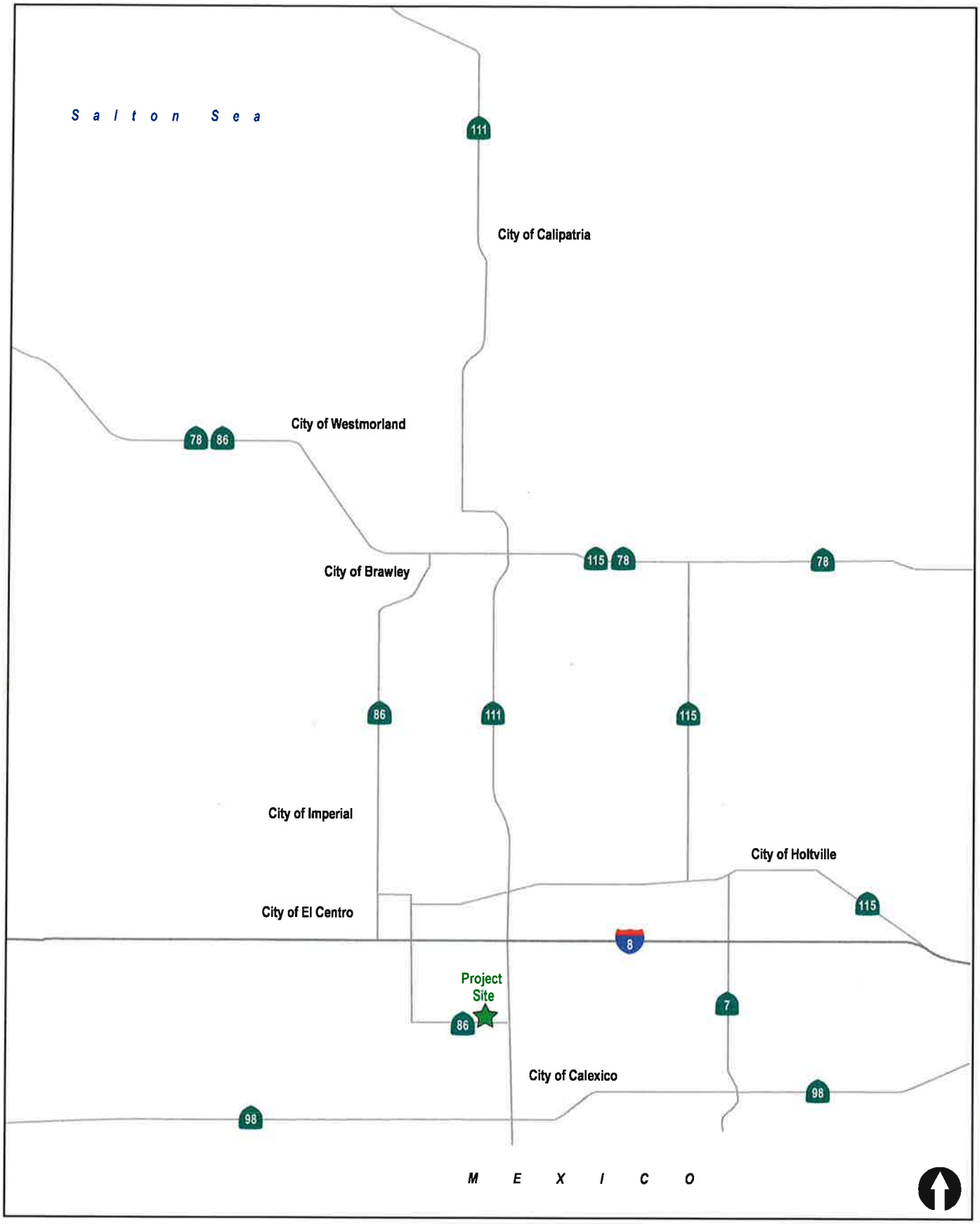

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Figure 1-2

Vicinity Map

SR-86 / Pitzer Road Intersection Control Evaluation (ICE)

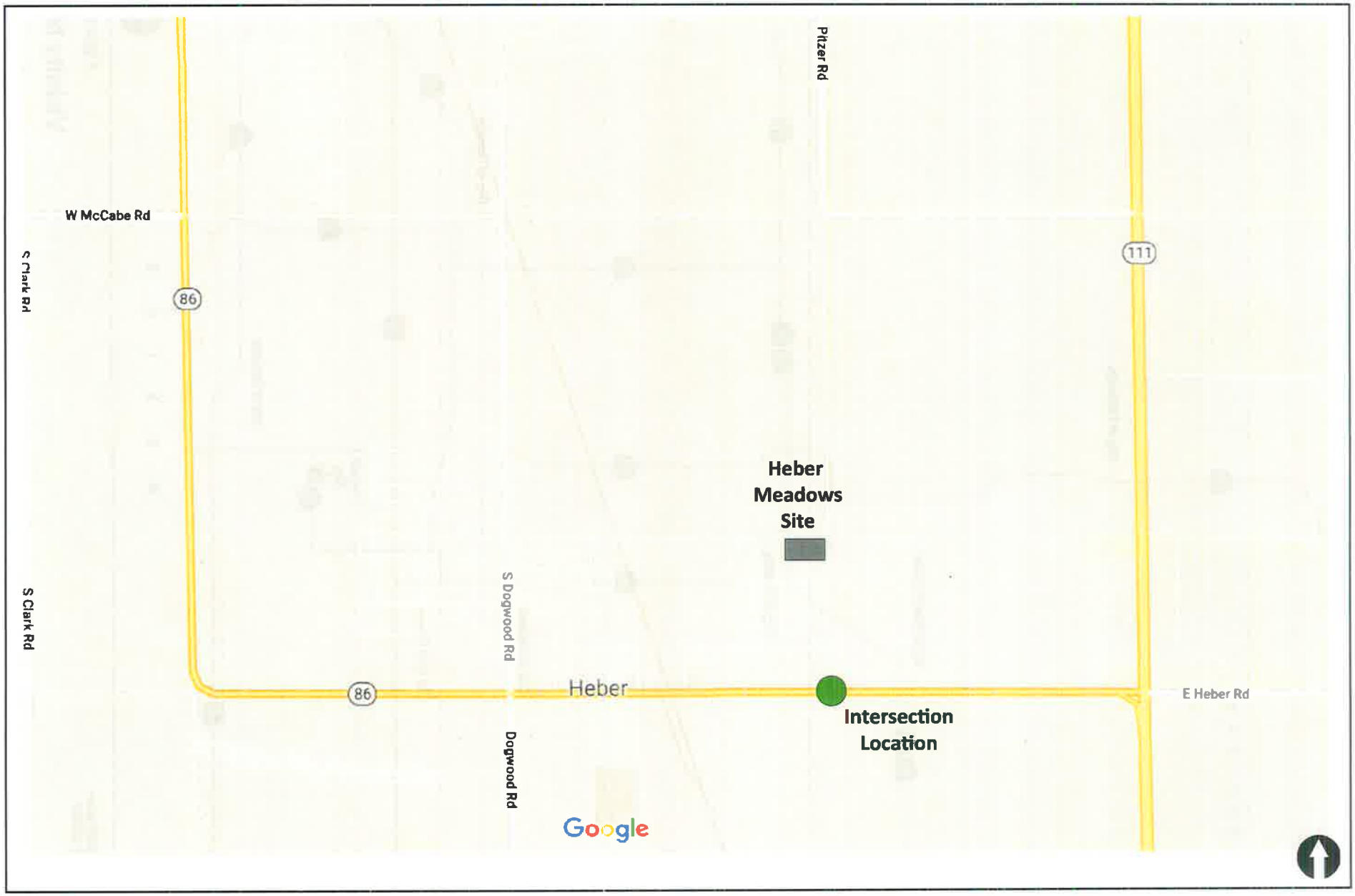

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Figure 1-3

Project Area Map

2.0 EXISTING TRAFFIC CONDITIONS

2.1 Existing Traffic Conditions

Following is a description of the two subject roadways:

SR 86

As described in the *Circulation and Scenic Highways Element*, Imperial County, January 29, 2008, State Route 86 (Heber Road) is generally a north-south route and begins near the Townsite of Heber as a two-lane conventional highway and ends at the Riverside County line as a four-lane expressway.

In the vicinity of the SR-86/Pitzer Road intersection, SR 86 is built as 2-Lane Road. Curb, gutter and sidewalks are not provided. Bike lanes and bus stops are not provided and the speed limit is posted at 55 mph.

Pitzer Road

As described in the *Circulation and Scenic Highways Element*, Imperial County, January 29, 2008, Pitzer Road is a two-lane north-south facility, which will eventually connect Chick Road to Fawcett Road. It is currently paved between Chick Road and McCabe Road with an ADT of 1,500, Pitzer Road is a principal route for traffic oriented to/from the Imperial Valley Mall.

In the vicinity of the SR-86/Pitzer Road intersection, Pitzer Road is built as 2-Lane Road south of SR 86. Pitzer Road terminates just north of SR 86. Curb, gutter and sidewalks are not provided. No speed limit is posted.

Existing conditions are depicted graphically on ***Figure 2-1***.

The SR-86/Pitzer Road intersection is currently a three-leg intersection, with stop control on northbound Pitzer Road. Currently, the north leg does not exist. Hence, the existing intersection geometry is as follows:

- Northbound: 1 shared left / right lane
- Westbound: 1 shared through / left-turn lane
- Eastbound: 1 shared through / right lane

2.2 Existing Traffic Volumes

Existing traffic volumes counted in September 2020, from the currently under preparation Heber Meadows Traffic Impact Analysis are shown on ***Figure 2-1***.

2.3 Safety Review - Existing Traffic Collision History

A total of one (1) collision occurred on SR 86 approximately 2,000 feet east of Pitzer Road based on accident data provided by the Statewide Integrated Traffic Records System (SWITRS) over the past five years (January 1, 2014 to December 31, 2018). This collision involved injury to one person and

was a rear end collision involving two vehicles. There are no fatalities reported at this location. As seen from the collision data no collisions are reported at the intersection itself.

Appendix A contains the Collision data.

2.4 Natural Habitat and Visual Impacts

The affected right of way is comprised primarily of disturbed soils with sparse ruderal vegetation within the existing right-of-way (ROW). East of Pitzer Road, agricultural land and overhead electrical transmission line poles are visible on both the north and south side of SR-86. There are no scenic resources occurring within this area. An irrigation canal runs north/south on the east side of Pitzer Road. West of Pitzer Road, single-family residences are located along the south side SR-86. A farm equipment yard is located on the north side. Several ornamental trees occur along the northern side of the ROW west of Pitzer Road. Electrical transmission line poles are also visible within this area. There are no scenic resources on either side of SR-86 east of Pitzer Road.

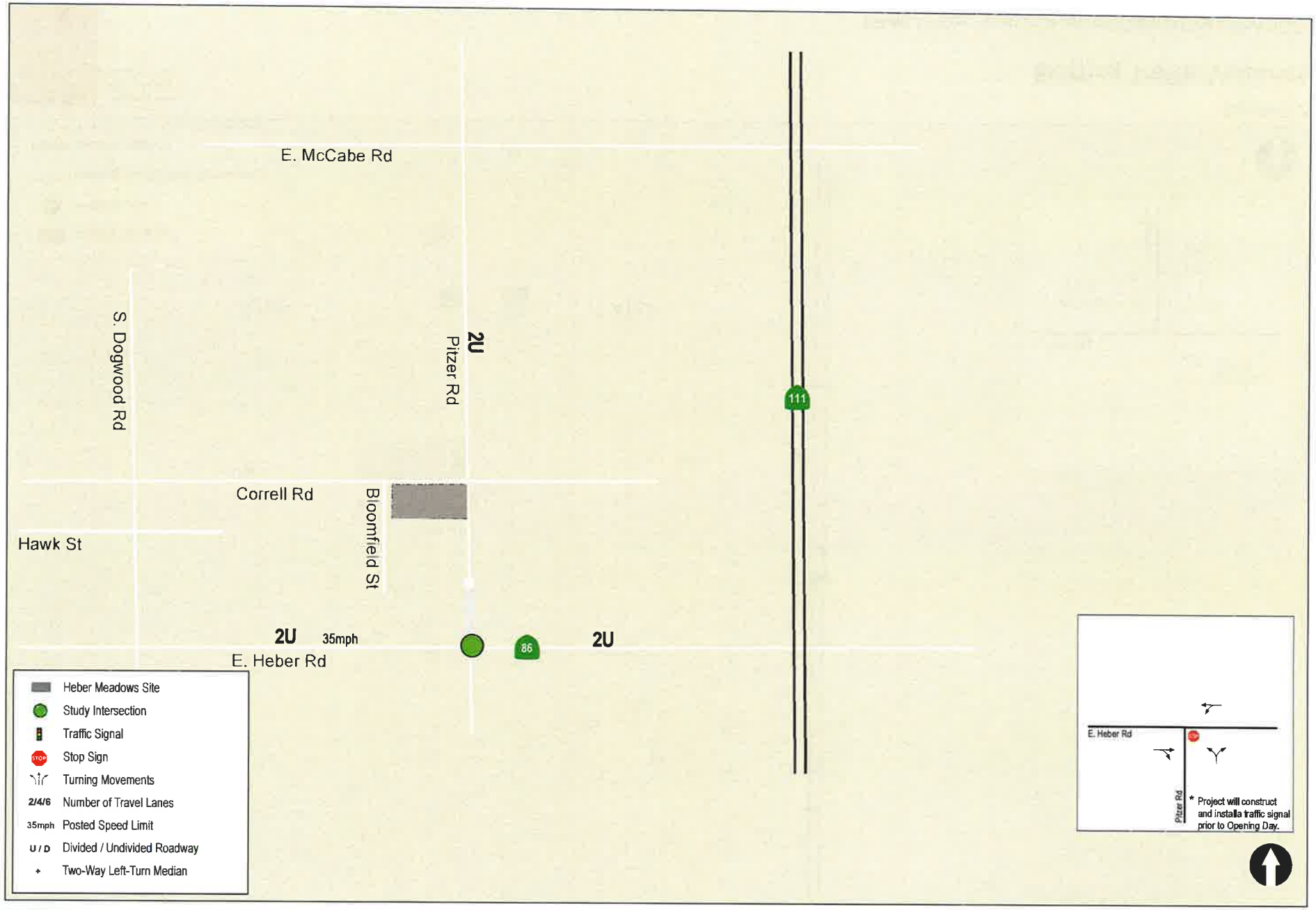

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Figure 2-1

Existing Conditions Diagram

SR-86 / Pitzer Road Intersection Control Evaluation (ICE)

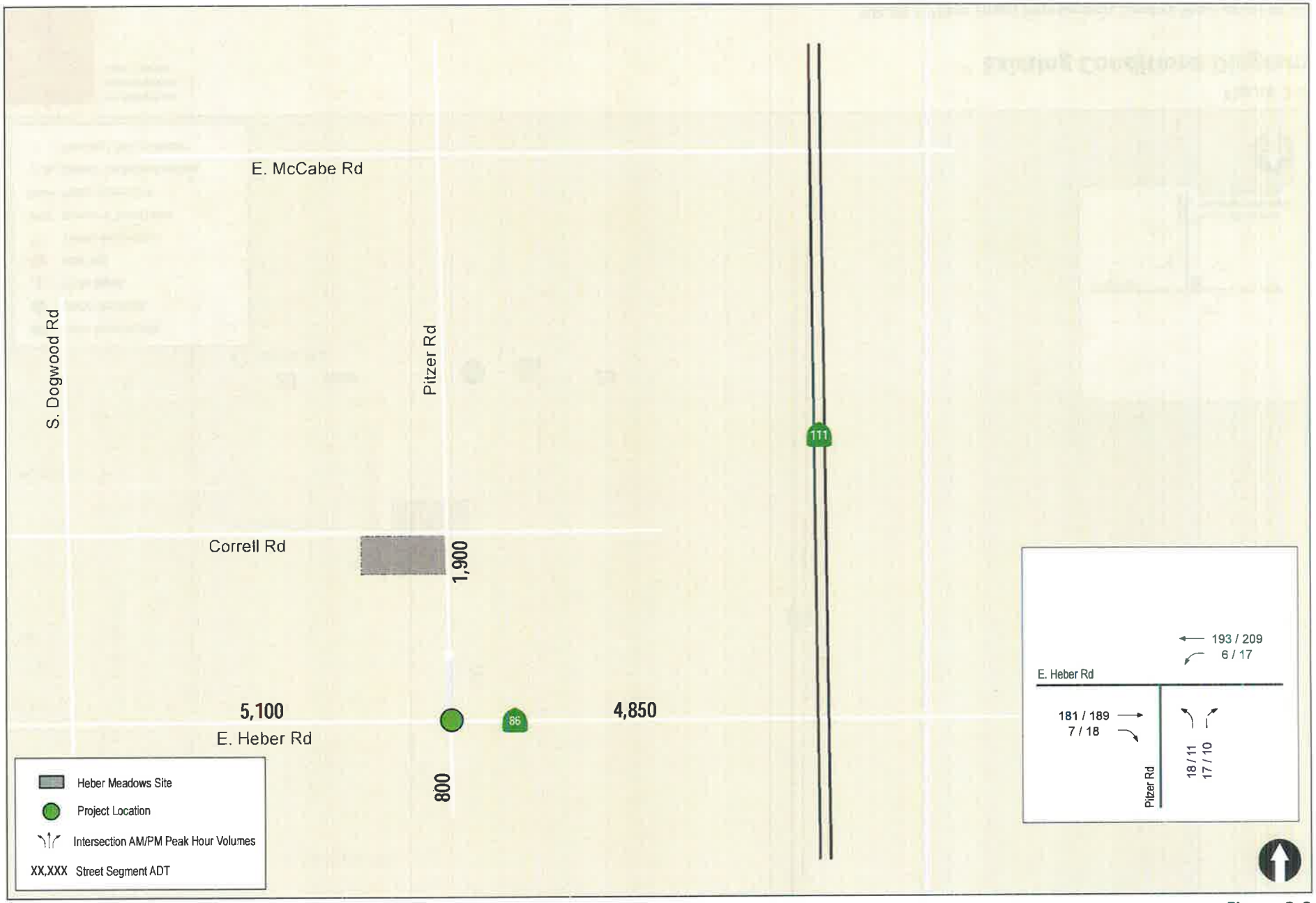

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Figure 2-2

Existing Traffic Volumes

SR-86 / Pitzer Road Intersection Control Evaluation (ICE)

3.0 YEAR 2040 TRAFFIC VOLUMES

The impetus for this analysis is the proposed reconfiguration and control of the SR 86 / Pitzer Road intersection. Currently, the SR 86 / Pitzer Road intersection is a T-intersection with no north leg. The fourth (north) leg will be provided at this intersection and will provide direct access from SR 86 to the north, connecting to Correll Road. The following intersection geometry is proposed at the SR 86 / Pitzer Road intersection:

- Southbound: One left turn lane and one shared through / right-turn lane (New north leg)
- Westbound: One left turn lane, one through lane and one right-turn lane
- Northbound: One left turn lane and one shared through / right-turn lane
- Eastbound: One left turn lane and one shared through / right-turn lane

3.1 Proposed Heber Meadows Project

The Heber Meadows Project is proposed on the south side of Correll Road between Bloomfield Street and Pitzer Road. A traffic impact analysis has been prepared under separate cover and is currently under review at the County and Caltrans. This project will add traffic to the SR 86 / Pitzer Road intersection and the Heber Meadows project traffic is included in the Year 2040 volumes. The traffic generated by this project is provided in ***Table 3-1*** for information.

As seen in *Table 3-1*, the Project is calculated to generate a total of 2,378 daily trips with 144 AM peak hour trips (33 inbound and 111 outbound) and 166 PM peak hour trips (105 inbound 61 outbound. The traffic added by this project to the SR 86 / Pitzer Road intersection was obtained from the Heber Meadows Traffic Impact Analysis.

3.2 Year 2040 Volumes Forecast

Year 2040 traffic forecast model is not available. Based on historical counts from 2013 through 2019 a growth factor was developed and applied to the existing traffic volumes. Historical volumes on SR 86 were obtained from the Caltrans Traffic Census website and compared. It was observed that traffic volumes have generally declined between 2013 and 2019 (***Appendix B***). It would be inappropriate to apply a negative growth. Hence an annual growth of 2% a year was applied to the Year 2020 (adjusted for Covid) segment volumes to obtain the year 2040 volumes. Historical volumes are not available for Pitzer Road. Hence a 1% a year growth was applied to the Year 2020 (adjusted for Covid) segment volumes to obtain the Year 2040 volumes on Pitzer Road.

In addition, the traffic generated by the proposed Heber Meadows project was assigned to the intersection and added to the calculated 2040 volumes to obtain the Year 2040 traffic volumes as shown on ***Table 3-2***.

Figure 3-1 depicts the Year 2040 with Heber Meadows Traffic Volumes.

TABLE 3-1
HEBER MEADOWS TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Apartments	320 DU	[b]	2,378	[c]	23 : 77	33	111	144	[d]	63 : 37	105	61	166

Footnotes:

a. Rates are based on the trip rates provided in the *Trip Generation* Manual, Institute of Transportation Engineers (ITE), 10th Edition.

b. The daily trip rates for Land Use 220, Multifamily Housing (Low Rise) was used to calculate the trip generation for the proposed apartment units. Daily trip rate: T = 7.56(X) - 40.86, T is the number of trips and X is the number of units.

c. The AM peak hour trip rates for Land Use 220, Multifamily Housing (low Rise) was used to calculate the trip generation for the proposed apartment units. AM peak hour trip rate: Ln(T) = 0.95 Ln(X) - 0.51.

d. The PM peak hour trip rates for Land Use 220, Multifamily Housing (low Rise) was used to calculate the trip generation for the proposed apartment units. PM peak hour trip rate: Ln(T) = 0.89 Ln(X) - 0.02

TABLE 3-2
YEAR 2040 SEGMENT VOLUMES FORECAST

Segment	Existing (2020)	Annual Growth [a]	Year 2040	Year 2040 [b] (Rounded)	Heber Meadows Volumes	Year 2040 + Project
Pitzer Road						
Correll Rd to SR 86	1,900 [c]	1%	2,280	2,300	440	2,740
SR 86 to E. Fawcett Rd	800	1%	960	1,000	0	1,000
SR 86						
West of Pitzer Rd	5,100	2%	7,140	7,100	0	7,100
East of Pitzer Rd	4,850	2%	6,790	6,800	440	7,240

Footnotes:

a. Annual growth rate on SR 86 estimated based on historical volume data obtained from Caltrans Traffic Census. Historical volumes data is not available for Pitzer Road and hence, the growth rate on Pitzer Road is estimated.
b. Year 2040 ADT volumes rounded to the nearest 100.
c. Estimated, as connection to SR 86 does not exist.

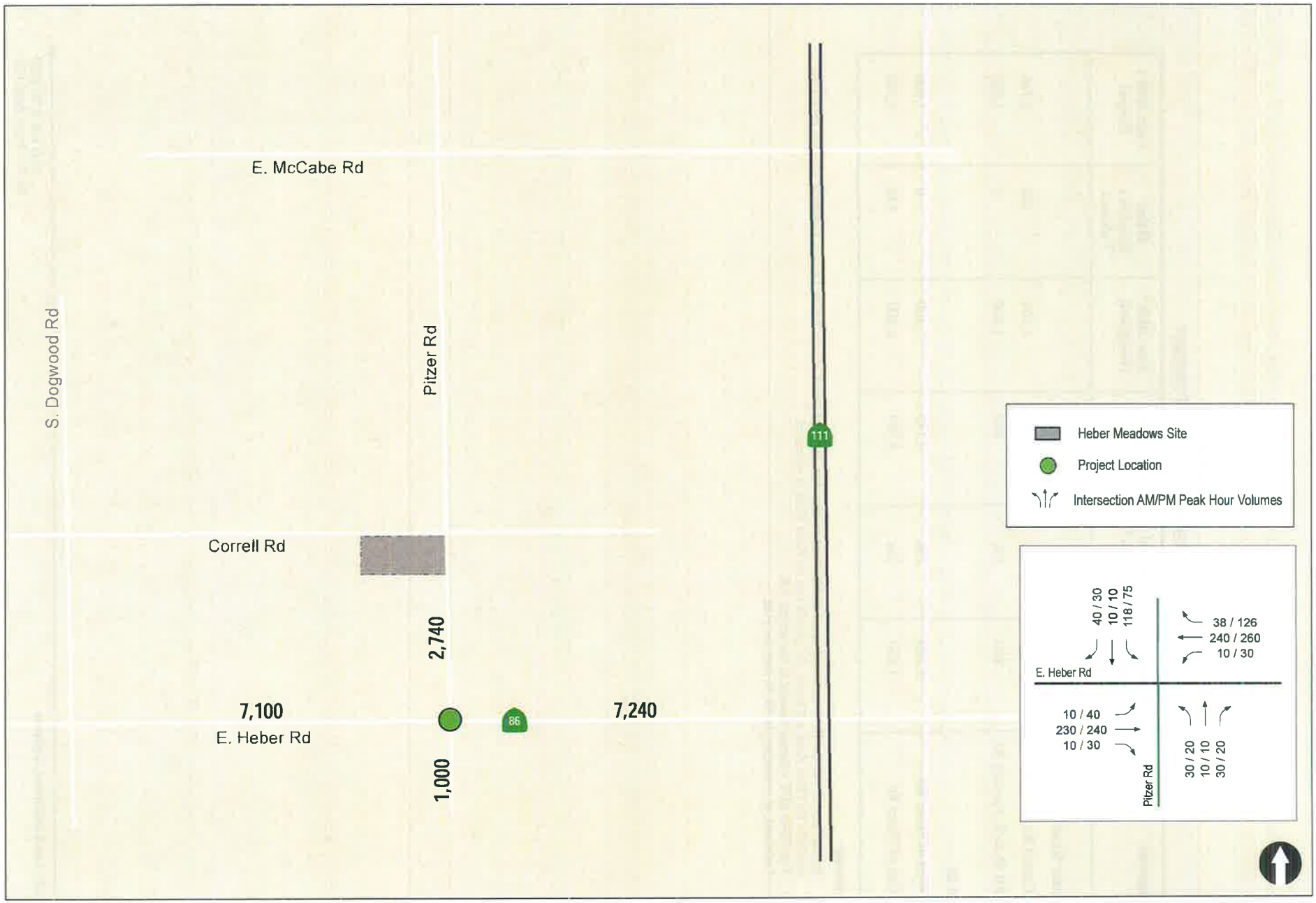

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Figure 3-1

Year 2040 Traffic Volumes

SR-86 / Pitzer Road Intersection Control Evaluation (ICE)

4.0 PLANNING-LEVEL SCREENING ANALYSIS

According to the ICE Process Steps & Outcomes flowchart provided in TOPD 13-02, an initial screening should be performed to eliminate options and strategies that fail to meet the established need. To facilitate this initial screening process ***Table 4-1*** provides thresholds for suggested control strategies by Average Daily Traffic on the adjacent roadways. The Design Year for modeling future traffic volumes and estimated ADT is 2040 and the estimated total entering ADT at this intersection is 18,080 vehicles per day. Using this ADT based screening method, grade separation can be eliminated as a rational traffic control strategy. Therefore, this study will proceed with the existing Minor-Street Stop Control, the All-Way Stop Control, Signal Control and Single-Lane Roundabout Control for the design and traffic analysis process.

TABLE 4-1
SUGGESTED INTERSECTION CONTROL STRATEGIES BY TOTAL ADT ENTERING

Total Entering ADT	All-Way Stop	Signal	Yield (RBT)	Grade Separation
7,500-15,000	X		X (Single-lane)	
15,000-25,000	X	X	X (Single-lane)	
25,000-80,000		X	X (Multi-lane)	
>80,000				X

4.1 Methodology

There are various methodologies used to analyze signalized and unsignalized. The measure of effectiveness for intersections is level of service (LOS) which denotes the operating conditions which occur at a given intersection. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. LOS provides an index to the operational qualities of an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. LOS designation is reported differently for signalized and unsignalized intersections.

Table 4-2 provides a description of the levels of service from A through F. ***Table 4–3*** summarizes the criteria, which are based on the average control delay for any particular minor movement (unsignalized intersections) and overall intersection (signalized intersections).

4.1.1 *Unsignalized Operations Evaluation*

For unsignalized intersections, LOS is determined by the computed or measured control delay and is defined for each minor movement. For All-Way-Stop-controlled (AWSC) intersections, the overall intersection delay is reported. For two-way-stop-controlled (TWSC) intersections, LOS is not defined for the intersection as a whole, but the worst-case movement (typically the minor street left-turn) delay and LOS are reported.

4.1.2 *Signal Operations Evaluation*

Level of service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-minute period within the hour analyzed. The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in addition to the stop delay. In the Highway Capacity Manual (HCM) 6th Edition, LOS for signalized intersections is defined in terms of delay. The LOS analysis provides results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

TABLE 4-2
LOS DESCRIPTIONS

LOS	Description
A	Operations with very low delay and most vehicles do not stop.
B	Operations with good progression but with some restricted movement.
C	Operations where a significant number of vehicles are stopping with some backup and light congestion.
D	Operations where congestion is noticeable, longer delays occur, and many vehicles stop. The proportion of vehicles not stopping declines
E	Operations where there is significant delay, extensive queuing, and poor progression.
F	Operations that is unacceptable to most drivers, when the arrival rates exceed the capacity of the intersection.

TABLE 4–3
INTERSECTION LEVEL OF SERVICE (LOS) & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: Highway Capacity Manual 6th Edition

4.2 Roundabout Operations Evaluation

The Highway Capacity Manual (HCM) published by the Transportation Research Board establishes procedures to evaluate highway facilities and rate their ability to process traffic volumes. The terminology "level of service" is used to provide a qualitative evaluation based on certain quantitative calculations, which are related to empirical values. NCHRP Report 672 – Roundabouts: An Informational Guide, Second Edition (TRB, 2010) provides the methodology for calculating the Level of Service (LOS) for yield-controlled roundabouts. ***Table 4-4*** displays the LOS thresholds for roundabouts presented in the HCM 6th Edition.

TABLE 4-4
LOS CRITERIA FOR ROUNDABOUT INTERSECTIONS

Control Delay (sec/veh)	Level of Service by Volume to Capacity Ratio	
	v/c≤1	v/c>1
≤10.0	A	F
>10.0 and ≤15.0	B	F
>15.0 and ≤25.0	C	F
>25.0 and ≤35.0	D	F
>35.0 and ≤50.0	E	F
>50.0	F	F

Source: 2010 Highway Capacity Manual, Chapter 22, Page 22-9, Exhibit 22-8.

5.0 INTERSECTION ANALYSIS

This section summarizes the traffic analysis results and other considerations for each intersection alternative. The following traffic control alternatives are evaluated, with detailed discussion of each alternative in this section:

1. Minor Street Stop Control (MSSC)
2. All-Way Stop Control (AWSC)
3. Traffic Signal
4. Roundabout

These alternatives were developed to establish what the intersection configuration requirements for operations to perform at LOS C or better during both peak periods per Caltrans Guide for the Preparation of Traffic Impact Studies, "Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities". Additionally, providing manageable queuing lengths is another goal of the alternatives design. As these are two very different types of control strategies, there are differences in the overall intersection footprint and lane geometry needs.

5.1 Intersection Analysis

Table 5-1 shows the intersection operations for each of the four (4) intersection controls. As shown in *Table 5-1*, the signal alternative and roundabout alternative are calculated to operate at acceptable LOS B or better under Year 2040 with Heber Meadows project traffic. The minor-street stop and all-way stop alternatives are calculated to operate at LOS C or better under Year 2040 with Heber Meadows project traffic.

Appendix C contains the peak hour intersection analysis worksheets for all alternatives.

5.2 Queue Analysis

Table 5-2 presents the queue lengths for each of the three intersection control alternatives under ear 2040 with Heber Meadows Traffic AM and PM peak hour volumes. The longer queue between the AM and PM peak hours is shown for each alternative. For the signal alternative, both the 50th percentile and 95th percentile queue length are calculated. For the unsignalized alternatives, only the 95th percentile queue length can be calculated, and for the MSSC alternative, queues can only be calculated for the stop-controlled approach.

Appendix C contains the queue analysis worksheets for all alternatives.

TABLE 5-1
INTERSECTION ANALYSIS

Control Type	Peak Hour	Delay [a]	LOS [b]
Existing			
TWSC	AM	10.3	B
	PM	10.8	B
Year 2040 with Heber Meadows Project			
TWSC	AM	18.5	C
	PM	21.1	C
Year 2040 with Heber Meadows Project			
AWSC	AM	12.7	B
	PM	12.9	B
Year 2040 with Heber Meadows Project			
Signal	AM	11.7	B
	PM	11.2	B
Year 2040 with Heber Meadows Project			
Roundabout	AM	5.2	A
	PM	5.9	A

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 5-2
QUEUE ANALYSIS

Scenario	Movement	Storage (feet)	50th Percentile Queue (Vehicles) [a]	Adequate?	95th Percentile Queue (Vehicles) [b]	Adequate?
Existing						
TWSC	SBL	100	[c]	Yes	0	Yes
	WBL	130	[c]	Yes	0	Yes
	NBL	100	[c]	Yes	1	Yes
	EBL	130	[c]	Yes	0	Yes
Year 2040						
TWSC	SBL	100	[c]	Yes	2	Yes
	WBL	130	[c]	Yes	1	Yes
	NBL	100	[c]	Yes	1	Yes
	EBL	130	[c]	Yes	1	Yes
AWSC	SBL	100	[c]	Yes	1	Yes
	WBL	130	[c]	Yes	1	Yes
	NBL	100	[c]	Yes	1	Yes
	EBL	130	[c]	Yes	1	Yes
Signal	SBL	100	2	Yes	3	Yes
	WBL	130	1	Yes	1	Yes
	NBL	100	1	Yes	2	Yes
	EBL	130	1	Yes	1	Yes
Roundabout	SBL	100	[d]	Yes	1	Yes
	WBL	130	[d]	Yes	2	Yes
	NBL	100	[d]	Yes	1	Yes
	EBL	130	[d]	Yes	3	Yes

Footnotes:

a. 50th percentile queue length in feet. Higher of AM and PM peak hours.
b. 95th percentile queue length in feet. Higher of AM and PM peak hours.
c. 50th percentile queue for uncontrolled movements and stop-control alternatives cannot be calculated.
d. 50th percentile queue cannot be calculated for the roundabout alternative.

6.0 INTERSECTION ALTERNATIVES DISCUSSION

The following is a detailed discussion of each alternative traffic control for the SR 86 / Pitzer Road intersection.

6.1 Minor-Street Stop Control Alternative

The minor-street stop control alternative retains the existing Stop sign traffic control on northbound Pitzer Road and assumes a stop control on new north leg (of Pitzer Road) approach. Analysis was completed using HCM 6 methodology and Synchro (version 10) software.

Figure 6-1 depicts the intersection geometry for the Minor-Street-Stop-Control (MSSC) alternative. As seen on *Figure 6-1*, it is proposed to provide one right-turn lane, one through lane and one left-turn lane in the westbound approach and an exclusive left-turn lane and a shared through/right lane on all remaining approaches.

The critical minor-street left-turn delay, the southbound left, is reported in *Table 5-1*. As seen, the southbound left movement is calculated to operate at an acceptable LOS C during the AM and PM peak hours with delays of 18.5 seconds and 21.1 seconds during the AM & PM peak hours respectively, with the MSSC. The calculated overall average delay for the intersection is less than five seconds, as traffic on the major street (SR-86) is not stopped.

The calculated queues in the left-turn movements on all approaches are 2 vehicles or less during the AM and PM peak hours. The storage provided in the left-turn movements on all approaches can accommodate the calculated queues.

Appendix C-1 contains the Minor-Street Stop Control Alternative intersection and queue analysis worksheets.

6.1.1 *Safety Considerations*

The most significant pedestrian conflict for TWSC intersections is pedestrians crossing the major street who have potentially severe conflicts with through vehicles on the major street. Pedestrians crossing the minor street will encounter drivers turning into the minor street with drivers being processed through the stop sign. These drivers are focused primarily on looking for gaps in the major street traffic and may not see pedestrians. Development of this project is not anticipated to generate any substantial increase in pedestrian crossing demand at this location and hence a marked pedestrian crossing is not recommended at this intersection.

6.1.2 *Right-of-Way Easement Impacts*

The existing highway right of way along SR 86 west of Pitzer Road is 100 ft, or 50 ft half width and east of Pitzer Road the Right of Way is 80 ft, or 50 ft north and 30 ft south of the centerline. Due to the required pavement widening to accommodate a westbound right turn, westbound left turn and eastbound left turn lane, this alternative would require 20 ft of right of way acquisition east of Pitzer Road on the north side of SR 86 to accommodate the proposed street widening and street drainage

conveyance system. The proposed acquisition area would impact the existing agricultural field and field drainage system.

The existing street Right of Way along Pitzer Road is 53 ft south of SR 86. North of SR 86, title records indicate no recorded easements or grant deeds for street purposes from up to Meridian Street, approximately 720' north of SR 86. This alternative would require 65 ft of right of way acquisition west of Pitzer Road north of SR 86. In addition, due to sight distance requirements, additional acquisition is required for sight corners at the northwest and southwest quadrants of the intersection. The sight corner acquisition at the northwest corner would impact an existing farm implement dealer and at the southwest corner the acquisition would be from a single-family home residence. East of Pitzer Road, Imperial Irrigation District (IID) operates an agricultural irrigation channel, which will be impacted by the proposed intersection widening. Additionally, IID has senior rights for the easement within the canal area. Therefore, the improvements and subsequent land encroachments will be coordinated with IID during the design process.

6.1.3 *Environmental Impacts*

The northbound leg of Pitzer Road would be constructed, thus, creating a four-way intersection. The Pitzer Road improvements would be constructed adjacent to and west of the canal. No impacts to native habitat or visual resources are expected to occur with implementation of the SR-86/Pitzer Road TWSC alternative.

6.2 All-Way Stop Control Alternative

Figure 6-2 depicts the intersection geometry for the All-Way-Stop-Control (AWSC) alternative. As seen in *Figure 6-2*, it is proposed to provide one right-turn lane, one through lane and one left-turn lane in the westbound approach and an exclusive left-turn lane and a shared through/right lane on all remaining approaches. The AWSC alternative assumes stop control on all four approaches. Analysis was completed using HCM 6 methodology and Synchro (version 10) software.

The overall intersection delay and LOS is reported in *Table 5-1*. As seen in *Table 5-1*, this intersection is calculated to operate at an overall LOS B during the AM and PM peak hours with delays of 12.7 seconds and 12.9 seconds during the AM & PM peak hours respectively, with AWSC.

The calculated queues in the left-turn movements on all approaches are 1 vehicle or less during the AM and PM peak hours. The storage provided in the left-turn movements on all approaches can accommodate the calculated queues.

Appendix C-2 contains the All-Way Stop Control Alternative intersection and queue analysis worksheets.

6.2.1 *Safety Considerations*

With the All-Way-Stop Control, vehicles on all approaches will stop and proceed when clear. Pedestrian crosswalks will be provided on all approaches. This will eliminate vehicle / pedestrian conflicts since every vehicle has to stop before proceeding through the intersection. As described previously, development of this project is not anticipated to generate any substantial increase in pedestrian crossing demand at this location.

6.2.2 *Right-of-Way Easement Impacts*

The amount of widening on SR 86 and Pitzer road for the AWSC alternative is the same as for the MSSC alternative and no additional right-of-way impacts are anticipated. Please see the description in the Section 6.1.2 above.

6.2.3 *Environmental Impacts*

The amount of widening on SR 86 and Pitzer road for the AWSC alternative is the same as for the MSSC alternative and no additional environmental impacts are anticipated. Please see the description in the Section 6.1.3 above.

6.3 Traffic Signal Alternative

Figure 6-3 depicts the intersection geometry for the Traffic Signal (Signal) alternative. As seen in *Figure 6-3*, it is proposed to provide one right-turn lane, one through lane and one left-turn lane in the westbound approach and an exclusive left-turn lane and a shared through/right lane on all remaining approaches. Analysis was completed using HCM 6 methodology and Synchro (version 10) software.

The overall intersection delay and LOS is reported in *Table 5-1*. As seen in *Table 5-1*, this intersection is calculated to operate at an overall LOS B during the AM and PM peak hours with delays of 11.7 seconds and 11.2 seconds during the AM & PM peak hours respectively, with Signal control.

The calculated queues in the left-turn movements on all approaches are 3 vehicles or less during the AM and PM peak hours. The storage provided in the left-turn movements on all approaches can accommodate the calculated queues.

Appendix C-3 contains the Traffic Signal Control Alternative intersection and queue analysis worksheets.

6.3.1 *Safety Considerations*

Traffic signals can reduce the likelihood of pedestrian-vehicle conflicts by providing visual and audible pedestrian signal indications in coordination with compatible vehicular traffic phases. However, pedestrian conflicts can still occur due to red light running (illegal), right turns on green, left turns on green, and right turns on red (legal). The greatest left-turn volume is 10 vehicles on southbound approach for this project. Based on the low minor-street volume and pedestrian activity, this location is not expected to be warranted for a traffic signal.

6.3.2 *Right-of-Way Easement Impacts*

The amount of widening on SR 86 and Pitzer road for the Traffic Signal alternative is the same as for the MSSC alternative and no additional right-of-way impacts are anticipated. Please see the description in the Section 6.1.2 above.

6.3.3 *Environmental Impacts*

The amount of widening on SR 86 and Pitzer road for the Traffic Signal alternative is the same as for the MSSC alternative and no additional environmental impacts are anticipated. Please see the description in the Section 6.1.3 above.

6.4 Roundabout

Figure 6-4 depicts the intersection geometry for the Roundabout. As seen in *Figure 6-4*, it is proposed to provide a single lane approach in all directions. Analysis was completed using Sidra software.

The overall intersection delay and LOS is reported in *Table 5-1*. As shown in *Table 5-1*, this intersection is calculated to operate at an overall LOS A during the AM and PM peak hours with delays of 5.2 seconds and 5.9 seconds during the AM & PM peak hours respectively, with Roundabout control.

The calculated queues in all approaches are 3 vehicles or less during the AM and PM peak hours. The storage provided in the left-turn movements on all approaches can accommodate the calculated queues.

In general, the performance of roundabouts during off-peak periods is good compared with other intersections forms, requiring fewer vehicles to stop or slow, though no off-peak analysis was completed at this intersection.

Appendix C-4 contains the Roundabout Control Alternative intersection and queue analysis worksheets.

6.4.1 *Safety Considerations*

A single-lane roundabout designed for low-speed operation, as is proposed for this intersection, is "one of the safest treatments available for at-grade intersections. Drivers have no lane decisions to make. Pedestrians cross one lane of traffic at a time. Roadways speeds and widths are low enough to allow comfortable mixed bicycle and motor vehicle flow." (NCHRP, 2010, pgs. 2-4)

Roundabouts often require more space than comparable stop-controlled or signalized intersections.

6.4.2 *Right-of-Way Easement Impacts*

See the right of way impacts under the 2-Way Stop alternative for a discussion on the existing right of way. If a single lane roundabout were implemented at the subject location, right of way would be required at both the northwest and southwest quadrants of the intersection. The roundabout design concept, depicting a 155-foot inscribed diameter, is required to accommodate a California legal WB-

62 design vehicle. The acquisition would impact an existing farm implement dealer at the northwest corner and a single-family home residence at the southwest corner.

East of Pitzer Road, Imperial Irrigation District (IID) operates an agricultural irrigation channel, which will be impacted by the proposed intersection widening. Additionally, IID has senior rights for the easement within the canal area. Therefore, the improvements and subsequent land encroachments will be coordinated with IID during the design process.

The necessary right of way outside Caltrans existing right of way is approximately 20,987 SF. The land value is estimated at $40,000 per acre for small parcels. The real unknown cost is the "Cost to Cure" for farming, utilities and power facilities. It should be noted the IID has prior rights for their irrigation and drainage facilities. The cost to pipeline the drain and lateral is a separate line item. In summary, most of the roundabout footprint is within existing right of way. The challenge is the "Cost to Cure" for utilities at the project location.

6.4.3 *Environmental Impacts*

The project would widen both SR-86 and Pitzer Road approaches and the intersection within the existing ROW. The northbound leg of Pitzer Road would be constructed, thus, creating a four-way intersection. The Pitzer Road improvements would be constructed adjacent to and west of the canal. The canal would not be directly affected by the project. No impacts to native habitat or visual resources are expected to occur with implementation of the SR-86/Pitzer Road Roundabout Alternative.

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Date: 03/16/21

Figure 6-1

Conceptual Plan - Two-Way Stop Control

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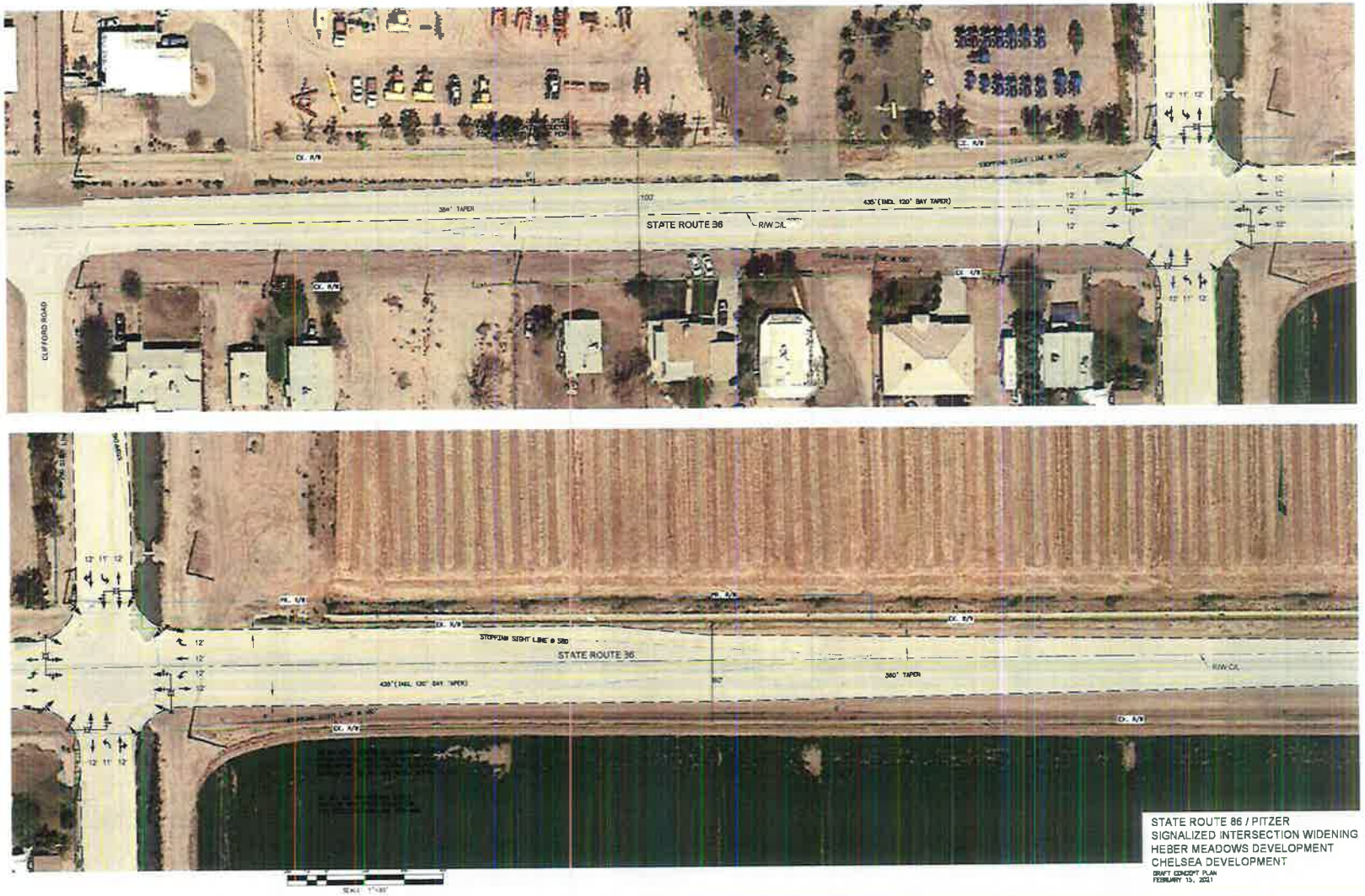
Date: 03/16/21

Figure 6-2

Conceptual Plan - All-Way Stop Control

SR-86 / PITZER ROAD INTERSECTION CONTROL EVALUATION (ICE)



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Date: 03/16/21

Figure 6-3

Conceptual Plan - Signal Control

STATE ROUTE 86 / PITZER
ROUNDABOUT CONCEPT
HEBER MEADOWS DEVELOPMENT
CHELSEA DEVELOPMENT
DRAFT CONCEPT PLAN
JANUARY 18, 2021

LINSCOTT LAW & GREENSPAN engineers

Figure 6-4

Conceptual Plan - Roundabout Control

7.0 PROJECT COSTS

This section will provide an analysis of the various costs associated with the four traffic control alternatives analyzed in this report.

7.1 Construction Cost

The construction cost for the four alternatives, including necessary widening to accommodate the required turn lanes, is summarized in ***Table 7-1***.

TABLE 7-1
ALTERNATIVES CONSTRUCTION COSTS

Alternative	Construction Cost
2-Way Stop Pavement Widening	$685,000
4-Way Stop Pavement Widening	$685,000
Traffic Signal w/ Pavement Widening	$985,000
Roundabout with corners Widening	$612,000

7.2 Operation and Maintenance Cost

Life cycle costs include the initial construction costs, user costs and benefits, maintenance costs and rehabilitation costs. The 20-year Stop Condition, Traffic Signal Maintenance and Roundabout Costs are provided in ***Tables 7-2*** through ***7-4***. It should be noted the 20-year cost is determined assuming 2% increase per year for 20 years.

TABLE 7-2
20-YEAR STOP CONDITION MAINTENANCE COSTS (INTERSECTION LIGHTING)

Cost Item	Lifespan (Years)	Replacement Cost	Cost Per Year	20-Year Cost
Electrical Costs	N/A	N/A	$1,300.00	$31,600
Maintenance	N/A	N/A	$1,600.00	$38,900
Overheard Safety Lighting Luminaires	15	$5,000.00	$250.00	$6,100
Street Light Poles	50	$11,000.00	$550.00	$13,400
Total:				**$90,000**

TABLE 7–3
20-YEAR TRAFFIC SIGNAL MAINTENANCE COSTS

Cost Item	Lifespan (Years)	Replacement Cost	Cost Per Year	20-Year Cost
Electrical Costs	N/A	N/A	$1,300.00	$31,600
Maintenance	N/A	N/A	$1,600.00	$38,900
Controller Cabinet & Equipment	20	$37,500.00	$1,600.00	$38,900
Video Detection Cameras	15	$13,000.00	$2,150.00	$52,300
Vehicle Detection Loops	10	$5,500.00	$550.00	$13,400
Vehicle LED Indications	10	$13,000.00	$550.00	$13,400
Pedestrian LED Indications	10	$8,000.00	$300.00	$7,300
Internally Illuminated Street Name Signs (IISNS)	15	$4,000.00	$650.00	$15,800
Overhead Safety Lighting Luminaires	15	$5,000.00	$250.00	$6,100
Wiring	30	$40,000.00	$750.00	$18,300
Signal Poles & Mast Arms	50	$90,000.00	$2,150.00	$52,300
Total:				**$288,300**

TABLE 7–4
20-YEAR ROUNDABOUT MAINTENANCE COSTS (INTERSECTION LIGHTING)

Cost Item	Lifespan (Years)	Replacement Cost	Cost Per Year	20-Year Cost
Electrical Costs	N/A	N/A	$1,300.00	$31,600
Maintenance	N/A	N/A	$1,600.00	$38,900
Overhead Safety Lighting Luminaires	15	$5,000.00	$250.00	$6,100
Street Light Poles	50	$11,000.00	$550.00	$13,400
Total:				**$90,000**

8.0 SUMMARY OF FINDINGS

The purpose of the ICE process is to objectively evaluate and screen intersection control alternatives at the SR 86 / Pitzer Road intersection. As part of the screening process, three intersection control alternatives were evaluated and analyzed in addition to the existing MSSC condition, an AWSC alternative, a Traffic Signal alternative and a Single-Lane yield controlled Roundabout alternative. The operations, safety, and right-of-way impacts were considered in each alternative.

According to the analysis results, all of the intersection control alternatives are forecast to operate at LOS C or better during the peak hours Also, the calculated queue lengths can be accommodated in all traffic control alternatives.

As described previously, in the MSSC alternative, a marked crossing cannot be provided on SR 86 since traffic is not stopped on SR 86. Based on the preliminary single-lane roundabout footprint, a portion of right-of-way would need to be acquired on all four corners of the intersection.

Table 8-1 is a comparison of the various parameters for each alternative.

TABLE 8-1
ICE PERFORMANCE MEASURE SUMMARY TABLE

Performance Measure	Two-Way Stop Control	All-Way Stop Control	Traffic Signal Alternative	Roundabout Alternative	Comments
Traffic Analysis					
Intersection Delay Analysis – All approaches LOS D or better (LOS A rated at a 5, LOS E rated at a 1).	3	4	4	**5**	Table 5-1
Queue Analysis – Adequate queue storage?	**Yes**	**Yes**	**Yes**	**Yes**	Table 5-2
Traffic Safety Analysis					
Vehicle Conflicts – The number of potential conflict points based on intersection geometry.	9	24	24	**4**	-
Bicycle Conflicts – The number of potential conflict points based on intersection geometry.	6	12	12	**8**	-
Pedestrian Conflicts – The number of potential conflict points based on intersection geometry.	12	24	24	**8**	-
Design					
Right-of-Way (ROW)	**Additional 20 ft and 65 ft of ROW required on Pitzer and SR 86 respectively**	**Additional 20 ft and 65 ft of ROW required on Pitzer and SR 86respectively**	**Additional 20 ft and 65 ft of ROW required on Pitzer and SR 86 respectively**	Additional 20,987 SF of ROW required and an unknown "cost to cure" for farming, utilities and power facilities	Section 6
Non-Standard Features – Based on the Highway Design Manual (HDM).	**0**	**0**	**0**	**0**	Figure 6-1 through Figure 6-4
Truck Accommodations – Serves design vehicle for all movements?	**Yes**	**Yes**	**Yes**	**Yes**	

CONTINUED ON THE NEXT PAGE

TABLE 8-1 (CONTINUED)
ICE PERFORMANCE MEASURE SUMMARY TABLE

Performance Measure	Two-Way Stop Control	All-Way Stop Control	Traffic Signal Alternative	Roundabout Alternative	Comments
CONTINUED FROM THE PREVIOUS PAGE					
Project Costs					
Construction Cost	$685,000	$685,000	$985,000	**$612,000**	Tables 7-1 through 7-4
Operations & Maintenance Cost	$90,000	$90,000	$288,300	**$90,000**	
TOTAL COST	$775,000	$775,000	$1,273,300	**$702,000**	
Total Performance Measures Met	Yes	Yes	Yes	**Yes**	

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TECHNICAL APPENDICES

SR 86 / PITZER ROAD

INTERSECTION CONTROL EVALUATION

Imperial County, California
March 31, 2021

LLG Ref. 3-20-3289

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APPENDICES

APPENDIX

APPENDIX A

EXISTING TRAFFIC COLLISION DATA


TIMS
SWITRS GIS Map
By SafeTREC, UC Berkeley
Map SWITRS
Tools
Options
Layers
Basemaps
Print
Help
E Correll Rd
E Willowbrook Way
Littlefield St
Bloomfield St
Fairfield St
Goldfield St
Harmony Way
Pitzer Rd
Hockwood Rd
Sunnyside Ct
Meridian St
6th St
Hefferman Rd
Hess Rd
Heber
E Main St
Mary Ave
E Heber Rd
Gill Rd
Clifford Rd
Pitzer Rd
600 ft
Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, Intermap, NGA, USGS
Powered by Esri
Results
Selected Factors:
Date 01/01/2014 - 12/31/2018
County Imperial
City All
Result Summary:
2,680 of 2,749 (97.5%) collisions mapped.
1 collision selected.
Clear Selection
Create Collision Diagram

Collision Severity	Count
1 - Fatal	0
2 - Injury (Severe)	0
3 - Injury (Other Visible)	0
4 - Injury (Complaint of Pain)	1

Type of Collision	Count
A - Head-On	0
B - Sideswipe	0
C - Rear End	1
D - Broadside	0
E - Hit Object	0
F - Overturned	0

Day of Collision	Count
1- Monday	0
2- Tuesday	1
3- Wednesday	0
4- Thursday	0
5- Friday	0
6- Saturday	0
7- Sunday	0

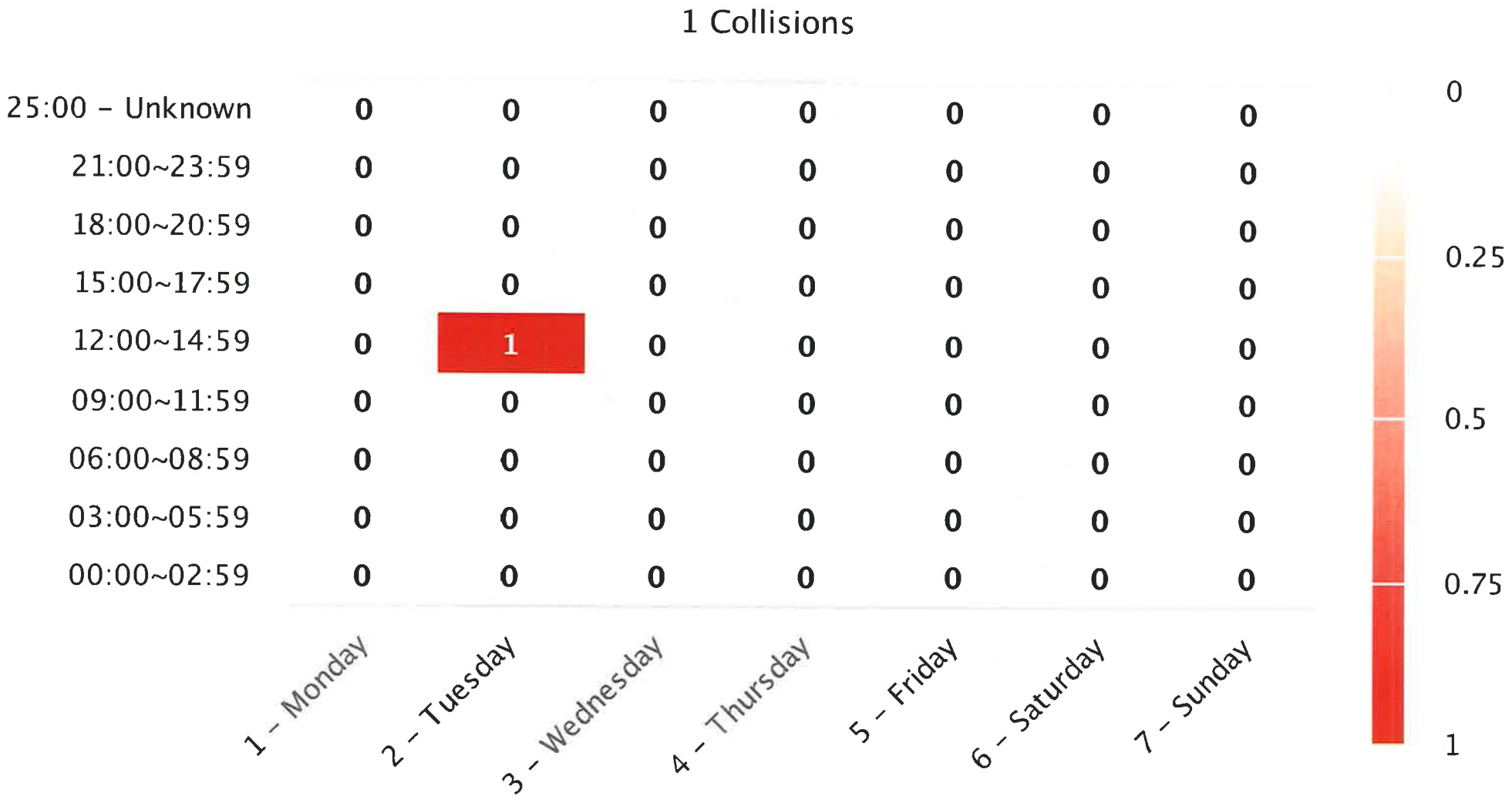
PCF Violation	Count
01 - Driving or Bicycling Under the Influence of Alcohol or Drug	0
03 - Unsafe Speed	1
05 - Wrong Side of Road	0
06 - Improper Passing	0
08 - Improper Turning	0
09 - Automobile Right of Way	0
12 - Traffic Signals and Signs	0
18 - Other Than Driver (or Pedestrian)	0

Number of Collisions by Collision Severity

Collision Severity

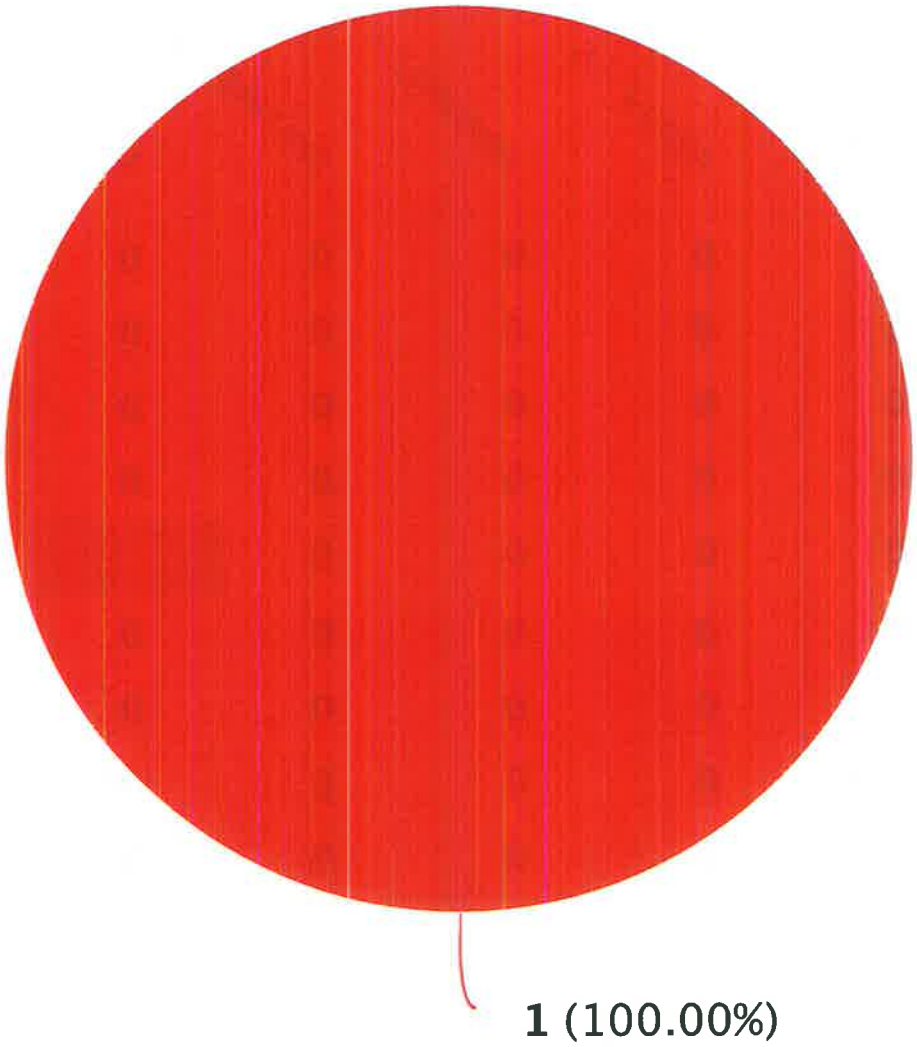
- 1 - Fatal
- 2 - Injury (Severe)
- 3 - Injury (Other Visible)
- 4 - Injury (Complaint of Pain)

Number of Collisions per Day of Week per Time

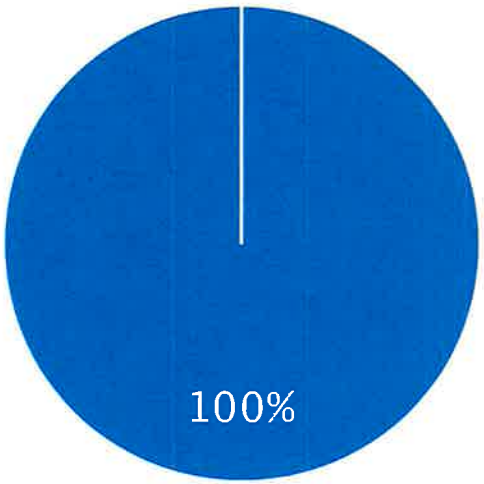


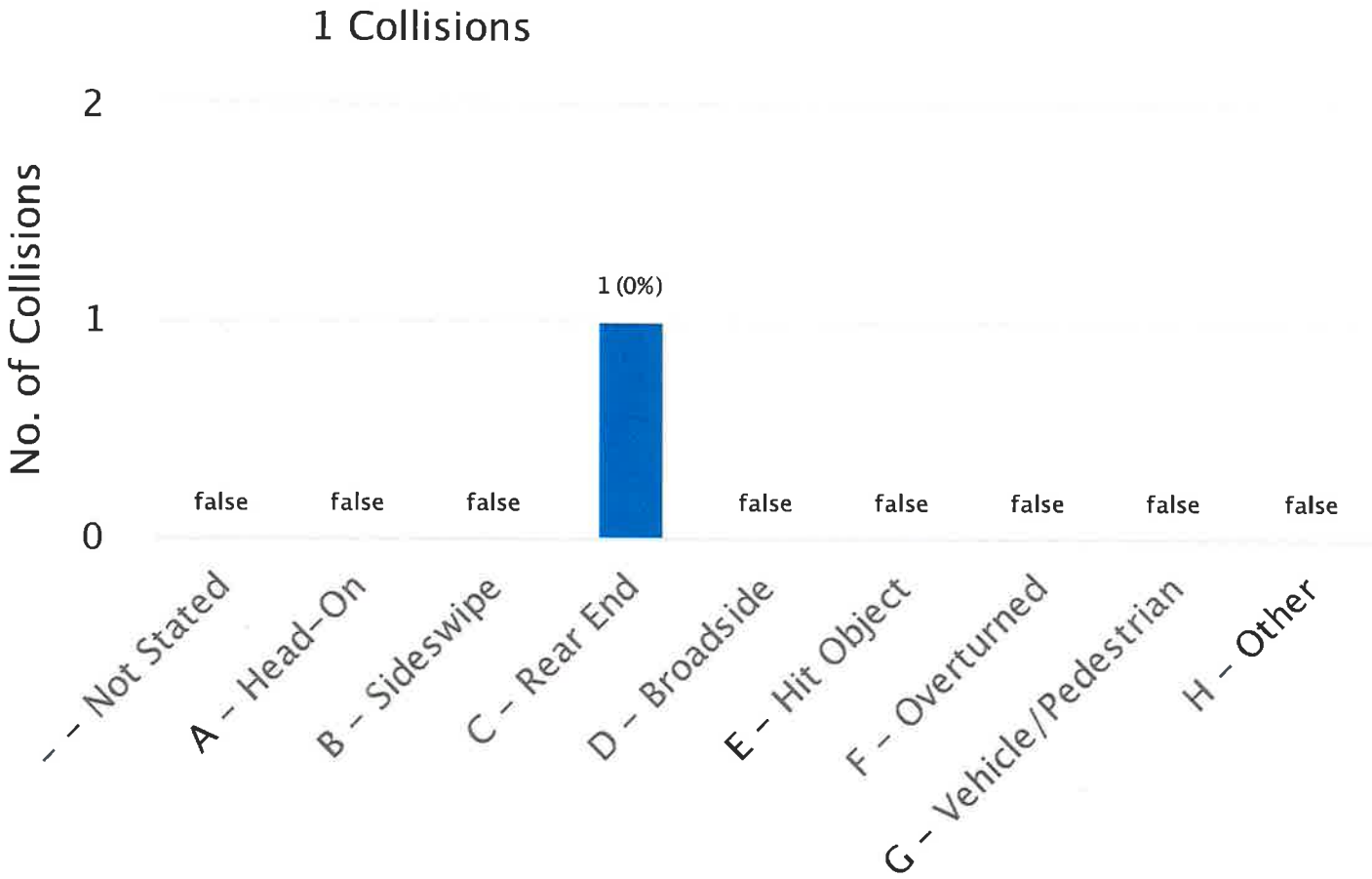
Number of Collisions by PCF Violation

1 Collisions



Number of Collisions by Type of Collision





Type of Collision

- - - Not Stated
- A - Head-On
- B - Sideswipe
- C - Rear End
- D - Broadside
- E - Hit Object
- F - Overturned
- G - Vehicle/Pedestrian
- H - Other

APPENDIX B

HISTORICAL SEGMENT TRAFFIC VOLUMES

SR 86

Segment	2013	2014	Annual Growth	2015	Annual Growth	2016	Annual Growth	2017	Annual Growth	2018	Annual Growth	2019	Annual Growth	Average Growth
East of Pitzer Rd	5,700	5,400	-5%	5,500	2%	5,500	0%	5,500	0%	5,700	4%	4,850	-15%	-2%
West of Pitzer Rd	6,600	5,800	-12%	5,900	2%	5,900	0%	5,900	0%	6,000	2%	5,100	-15%	-4%

APPENDIX C

INTERSECTION AND QUEUE ANALYSIS WORKSHEETS

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	⋎	
Traffic Vol, veh/h	181	7	6	193	11	17
Future Vol, veh/h	181	7	6	193	11	17
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	197	8	7	210	12	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	205	0	425	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	224	-
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	-	-	1366	-	586	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	813	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1366	-	582	840
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	808	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	715	-	-	1366	-
HCM Lane V/C Ratio	0.043	-	-	0.005	-
HCM Control Delay (s)	10.3	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑↑	
Traffic Vol, veh/h	189	18	17	209	11	10
Future Vol, veh/h	189	18	17	209	11	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	205	20	18	227	12	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	225	0	478	215
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	263	-
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	-	-	1344	-	546	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1344	-	538	825
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	645	-	-	1344	-
HCM Lane V/C Ratio	0.035	-	-	0.014	-
HCM Control Delay (s)	10.8	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

APPENDIX C-1

MINOR-STREET STOP-CONTROL

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	230	10	10	240	38	30	10	30	118	10	40
Future Vol, veh/h	10	230	10	10	240	38	30	10	30	118	10	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	0	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	250	11	11	261	41	33	11	33	128	11	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	302	0	0	261	0	0	609	602	256	583	566	261
Stage 1	-	-	-	-	-	-	278	278	-	283	283	-
Stage 2	-	-	-	-	-	-	331	324	-	300	283	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1259	-	-	1303	-	-	407	414	783	424	434	778
Stage 1	-	-	-	-	-	-	728	680	-	724	677	-
Stage 2	-	-	-	-	-	-	682	650	-	709	677	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1259	-	-	1303	-	-	372	407	783	393	427	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	372	407	-	393	427	-
Stage 1	-	-	-	-	-	-	721	674	-	717	672	-
Stage 2	-	-	-	-	-	-	628	645	-	663	671	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.3	13	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	372	636	1259	-	-	1303	-	-	393	668
HCM Lane V/C Ratio	0.088	0.068	0.009	-	-	0.008	-	-	0.326	0.081
HCM Control Delay (s)	15.6	11.1	7.9	-	-	7.8	-	-	18.5	10.9
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.2	0	-	-	0	-	-	1.4	0.3

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	240	30	30	260	126	20	10	20	75	10	30
Future Vol, veh/h	40	240	30	30	260	126	20	10	20	75	10	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	0	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	261	33	33	283	137	22	11	22	82	11	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	420	0	0	294	0	0	804	850	278	729	729	283
Stage 1	-	-	-	-	-	-	364	364	-	349	349	-
Stage 2	-	-	-	-	-	-	440	486	-	380	380	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1139	-	-	1268	-	-	301	298	761	338	350	756
Stage 1	-	-	-	-	-	-	655	624	-	667	633	-
Stage 2	-	-	-	-	-	-	596	551	-	642	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1268	-	-	267	279	761	304	328	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	267	279	-	304	328	-
Stage 1	-	-	-	-	-	-	630	600	-	642	617	-
Stage 2	-	-	-	-	-	-	546	537	-	589	591	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.6	15.7	17.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	267	483	1139	-	-	1268	-	-	304	570
HCM Lane V/C Ratio	0.081	0.068	0.038	-	-	0.026	-	-	0.268	0.076
HCM Control Delay (s)	19.7	13	8.3	-	-	7.9	-	-	21.1	11.8
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.2	0.1	-	-	0.1	-	-	1.1	0.2

APPENDIX C-2

ALL-WAY STOP-CONTROL

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	230	10	10	240	38	30	10	30	118	10	40
Future Vol, veh/h	10	230	10	10	240	38	30	10	30	118	10	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	250	11	11	261	41	33	11	33	128	11	43
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	2
HCM Control Delay	13.8	13.1	10.1	11.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	25%	0%	96%	0%	100%	0%	0%	20%
Vol Right, %	0%	75%	0%	4%	0%	0%	100%	0%	80%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	40	10	240	10	240	38	118	50
LT Vol	30	0	10	0	10	0	0	118	0
Through Vol	0	10	0	230	0	240	0	0	10
RT Vol	0	30	0	10	0	0	38	0	40
Lane Flow Rate	33	43	11	261	11	261	41	128	54
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.067	0.077	0.02	0.451	0.02	0.449	0.063	0.253	0.091
Departure Headway (Hd)	7.426	6.388	6.759	6.224	6.697	6.191	5.484	7.114	6.044
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	481	558	529	577	534	582	651	504	591
Service Time	5.194	4.156	4.512	3.976	4.446	3.94	3.233	4.873	3.803
HCM Lane V/C Ratio	0.069	0.077	0.021	0.452	0.021	0.448	0.063	0.254	0.091
HCM Control Delay	10.7	9.7	9.7	14	9.6	13.9	8.6	12.3	9.4
HCM Lane LOS	B	A	A	B	A	B	A	B	A
HCM 95th-tile Q	0.2	0.2	0.1	2.3	0.1	2.3	0.2	1	0.3

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	240	30	30	260	126	20	10	20	75	10	30
Future Vol, veh/h	40	240	30	30	260	126	20	10	20	75	10	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	261	33	33	283	137	22	11	22	82	11	33
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	2
HCM Control Delay	14.4	12.5	10.4	11.1
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	33%	0%	89%	0%	100%	0%	0%	25%
Vol Right, %	0%	67%	0%	11%	0%	0%	100%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	30	40	270	30	260	126	75	40
LT Vol	20	0	40	0	30	0	0	75	0
Through Vol	0	10	0	240	0	260	0	0	10
RT Vol	0	20	0	30	0	0	126	0	30
Lane Flow Rate	22	33	43	293	33	283	137	82	43
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.047	0.061	0.081	0.502	0.06	0.477	0.204	0.17	0.078
Departure Headway (Hd)	7.725	6.745	6.74	6.157	6.585	6.08	5.373	7.496	6.46
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	529	531	584	543	591	666	477	553
Service Time	5.498	4.518	4.491	3.908	4.333	3.828	3.122	5.262	4.224
HCM Lane V/C Ratio	0.048	0.062	0.081	0.502	0.061	0.479	0.206	0.172	0.078
HCM Control Delay	10.9	10	10.1	15	9.8	14.3	9.5	11.8	9.8
HCM Lane LOS	B	A	B	B	A	B	A	B	A
HCM 95th-tile Q	0.1	0.2	0.3	2.8	0.2	2.6	0.8	0.6	0.3

APPENDIX C-3

SIGNAL CONTROL

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	230	10	10	240	38	30	10	30	118	10	40
Future Volume (veh/h)	10	230	10	10	240	38	30	10	30	118	10	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	250	11	11	261	41	33	11	33	128	11	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	424	19	360	446	378	289	67	200	289	54	211
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1077	1778	78	1118	1870	1585	1781	412	1236	1781	333	1303
Grp Volume(v), veh/h	11	0	261	11	261	41	33	0	44	128	0	54
Grp Sat Flow(s),veh/h/ln	1077	0	1856	1118	1870	1585	1781	0	1648	1781	0	1636
Q Serve(g_s), s	0.3	0.0	3.8	0.3	3.8	0.6	0.5	0.0	0.7	2.0	0.0	0.9
Cycle Q Clear(g_c), s	4.1	0.0	3.8	4.1	3.8	0.6	0.5	0.0	0.7	2.0	0.0	0.9
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.75	1.00		0.80
Lane Grp Cap(c), veh/h	357	0	442	360	446	378	289	0	267	289	0	265
V/C Ratio(X)	0.03	0.00	0.59	0.03	0.59	0.11	0.11	0.00	0.16	0.44	0.00	0.20
Avail Cap(c_a), veh/h	729	0	1083	747	1091	925	1039	0	962	1039	0	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	10.4	12.2	10.4	9.2	11.0	0.0	11.1	11.7	0.0	11.2
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.0	1.2	0.1	0.2	0.0	0.3	1.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.3	0.1	1.3	0.2	0.2	0.0	0.2	0.7	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	11.7	12.3	11.6	9.3	11.2	0.0	11.4	12.7	0.0	11.6
LnGrp LOS	B	A	B	B	B	A	B	A	B	B	A	B
Approach Vol, veh/h		272			313			77			182	
Approach Delay, s/veh		11.7			11.3			11.3			12.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		9.5		11.8		9.5		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.7		6.1		4.0		6.1				
Green Ext Time (p_c), s		0.2		1.2		0.5		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			11.7									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
1: Pitzer Rd & Heber Rd

03/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	240	30	30	260	126	20	10	20	75	10	30
Future Volume (veh/h)	40	240	30	30	260	126	20	10	20	75	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	261	33	33	283	137	22	11	22	82	11	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	453	57	373	520	441	274	86	171	274	63	190
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	967	1628	206	1085	1870	1585	1781	557	1113	1781	412	1236
Grp Volume(v), veh/h	43	0	294	33	283	137	22	0	33	82	0	44
Grp Sat Flow(s),veh/h/ln	967	0	1833	1085	1870	1585	1781	0	1670	1781	0	1648
Q Serve(g_s), s	1.3	0.0	4.5	0.9	4.2	2.2	0.3	0.0	0.6	1.3	0.0	0.8
Cycle Q Clear(g_c), s	5.5	0.0	4.5	5.4	4.2	2.2	0.3	0.0	0.6	1.3	0.0	0.8
Prop In Lane	1.00		0.11	1.00		1.00	1.00		0.67	1.00		0.75
Lane Grp Cap(c), veh/h	366	0	510	373	520	441	274	0	257	274	0	253
V/C Ratio(X)	0.12	0.00	0.58	0.09	0.54	0.31	0.08	0.00	0.13	0.30	0.00	0.17
Avail Cap(c_a), veh/h	631	0	1014	672	1034	876	985	0	923	985	0	911
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	10.1	12.4	10.0	9.3	11.8	0.0	11.9	12.2	0.0	12.0
Incr Delay (d2), s/veh	0.1	0.0	1.0	0.1	0.9	0.4	0.1	0.0	0.2	0.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.2	1.3	0.6	0.1	0.0	0.2	0.5	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	0.0	11.1	12.5	10.9	9.7	11.9	0.0	12.1	12.8	0.0	12.3
LnGrp LOS	B	A	B	B	B	A	B	A	B	B	A	B
Approach Vol, veh/h		337			453			55			126	
Approach Delay, s/veh		11.3			10.6			12.0			12.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		9.5		13.6		9.5		13.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		2.6		7.5		3.3		7.4				
Green Ext Time (p_c), s		0.1		1.4		0.3		1.7				

Intersection Summary												
HCM 6th Ctrl Delay			11.2									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	261	11	261	41	33	44	128	54
v/c Ratio	0.04	0.51	0.04	0.51	0.08	0.12	0.15	0.41	0.13
Control Delay	12.1	16.9	12.1	17.0	0.9	18.8	11.3	19.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	16.9	12.1	17.0	0.9	18.8	11.3	19.1	7.8
Queue Length 50th (ft)	2	48	2	48	0	7	2	24	2
Queue Length 95th (ft)	11	115	11	116	4	29	25	72	23
Internal Link Dist (ft)		2537		2507			308		389
Turn Bay Length (ft)									
Base Capacity (vph)	479	835	479	838	766	797	762	610	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.31	0.02	0.31	0.05	0.04	0.06	0.21	0.07

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	294	33	283	137	22	33	82	44
v/c Ratio	0.14	0.54	0.11	0.52	0.24	0.08	0.12	0.30	0.12
Control Delay	11.9	15.7	11.6	15.6	4.0	17.8	12.0	18.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	15.7	11.6	15.6	4.0	17.8	12.0	18.0	9.0
Queue Length 50th (ft)	7	50	5	49	0	4	2	15	2
Queue Length 95th (ft)	25	115	21	113	26	21	21	50	22
Internal Link Dist (ft)		2542		2502			465		254
Turn Bay Length (ft)									
Base Capacity (vph)	478	854	462	864	808	821	789	636	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.34	0.07	0.33	0.17	0.03	0.04	0.13	0.06

Intersection Summary

APPENDIX C-4

ROUNDABOUT CONTROL

MOVEMENT SUMMARY

Site: 101 [Year 2040 with Hudson Project AM]

SR 86 / Pitzer Road
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 86											
3	L2	33	3.0	0.086	4.9	LOS A	0.3	8.9	0.48	0.37	34.0
8	T1	11	3.0	0.086	4.9	LOS A	0.3	8.9	0.48	0.37	34.0
18	R2	33	3.0	0.086	4.9	LOS A	0.3	8.9	0.48	0.37	33.0
Approach		76	3.0	0.086	4.9	LOS A	0.3	8.9	0.48	0.37	33.6
East: Pitzer Road											
1	L2	11	3.0	0.248	5.0	LOS A	1.3	33.1	0.20	0.08	35.2
6	T1	261	3.0	0.248	5.0	LOS A	1.3	33.1	0.20	0.08	35.1
16	R2	41	3.0	0.248	5.0	LOS A	1.3	33.1	0.20	0.08	34.1
Approach		313	3.0	0.248	5.0	LOS A	1.3	33.1	0.20	0.08	35.0
North: SR 86											
7	L2	128	3.0	0.188	5.5	LOS A	0.8	21.5	0.46	0.36	33.0
4	T1	11	3.0	0.188	5.5	LOS A	0.8	21.5	0.46	0.36	32.9
14	R2	43	3.0	0.188	5.5	LOS A	0.8	21.5	0.46	0.36	32.0
Approach		183	3.0	0.188	5.5	LOS A	0.8	21.5	0.46	0.36	32.8
West: Pitzer Road											
5	L2	11	3.0	0.238	5.3	LOS A	1.2	30.1	0.35	0.21	35.0
2	T1	250	3.0	0.238	5.3	LOS A	1.2	30.1	0.35	0.21	34.9
12	R2	11	3.0	0.238	5.3	LOS A	1.2	30.1	0.35	0.21	33.9
Approach		272	3.0	0.238	5.3	LOS A	1.2	30.1	0.35	0.21	34.9
All Vehicles		843	3.0	0.248	5.2	LOS A	1.3	33.1	0.33	0.21	34.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Year 2040 with Hudson Project PM]

SR 86 / Pitzer Road
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 86											
3	L2	22	3.0	0.061	4.6	LOS A	0.2	6.2	0.47	0.35	34.3
8	T1	11	3.0	0.061	4.6	LOS A	0.2	6.2	0.47	0.35	34.2
18	R2	22	3.0	0.061	4.6	LOS A	0.2	6.2	0.47	0.35	33.2
Approach		54	3.0	0.061	4.6	LOS A	0.2	6.2	0.47	0.35	33.8
East: Pitzer Road											
1	L2	33	3.0	0.367	6.4	LOS A	2.2	56.1	0.28	0.14	34.3
6	T1	283	3.0	0.367	6.4	LOS A	2.2	56.1	0.28	0.14	34.2
16	R2	137	3.0	0.367	6.4	LOS A	2.2	56.1	0.28	0.14	33.2
Approach		452	3.0	0.367	6.4	LOS A	2.2	56.1	0.28	0.14	33.9
North: SR 86											
7	L2	82	3.0	0.133	5.1	LOS A	0.6	14.5	0.47	0.36	33.3
4	T1	11	3.0	0.133	5.1	LOS A	0.6	14.5	0.47	0.36	33.3
14	R2	33	3.0	0.133	5.1	LOS A	0.6	14.5	0.47	0.36	32.4
Approach		125	3.0	0.133	5.1	LOS A	0.6	14.5	0.47	0.36	33.1
West: Pitzer Road											
5	L2	43	3.0	0.288	5.7	LOS A	1.5	38.8	0.33	0.19	34.5
2	T1	261	3.0	0.288	5.7	LOS A	1.5	38.8	0.33	0.19	34.5
12	R2	33	3.0	0.288	5.7	LOS A	1.5	38.8	0.33	0.19	33.5
Approach		337	3.0	0.288	5.7	LOS A	1.5	38.8	0.33	0.19	34.4
All Vehicles		968	3.0	0.367	5.9	LOS A	2.2	56.1	0.34	0.20	34.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Attachment "J"

BIRDSEYE
PLANNING GROUP

January 13, 2022

Mr. Dave Davis
Development Manager
Chelsea Investment Corporation
6339 Paseo Del Lago
Carlsbad, CA 92011

SUBJECT: Heber Meadows Affordable Housing Project School Facility Needs Letter

Dear Mr. Davis:

Birdseye Planning Group (BPG) is pleased to submit this letter in response to the comment received from the Imperial County Planning Department regarding school facility needs or demand for school services associated with the proposed project. We initially researched this issue in January 2021. In summary, the Heber Elementary School District (HESD) is composed of two elementary schools (TK - 3rd grade; 4th thru 8th grade). High School students attend Southwestern High School in the Central Union High School District. The Central Union School District (CUSD) had a Level I Developer Fee Study prepared which was approved in April 2020. This study estimates the total number of dwelling units to be constructed within the District(s) and associated student generation anticipated through 2040. Based on the anticipated number of students, the study provides documentation justifying the collection of impact fees from housing developers. The Heber School District does not have a similar study because CUSD collects developer fees and shares them with the HESD feeder schools.

Imperial County Planning stated in January 2021 that the Level 1 Developer Fee Study (April 2020) identified 207 units for Heber Meadows and requested an updated study to address 300 units. As we discussed last year, these studies are commissioned and funded by the individual school districts. These are not prepared by project applicants. As stated in the Heber Meadows Initial Study, the April 2020 Level 1 Developer Fee Study assumed a total of 741 multifamily residences would be developed in unincorporated Imperial County over the next 20 years. While the 320 units proposed by the project, would exceed the number approved as part of the previous Heber Meadows project (i.e., 207 units), the number is within the 741 units anticipated. Further, using a generation rate of 0.111 students per multifamily residence provided in Table 2 of the Level 1 Developer Fee Study, 741 total units would generate approximately 82 students. The 207 multifamily units approved as part of the original Heber Meadows project would generate approximately 23 students. The addition of 113 units would generate 12 studies; thus, the total number of students could generate up to 35 total students at any given time. This would equate to approximately 42 percent of anticipated students generated by multifamily units anticipated to be constructed in unincorporated Imperial County. As further stated in the Initial Study, the applicant would be required to impact pay fees per unit to contribute a fair share to school development and modernization costs. This fee would be up to $4.08 per square foot,

which is the Level 1 statutory fee. Because the details regarding when and how many students would be generated by an individual project, and when or if other projects within the District would be developed, stating the project applicant would be required to pay impact fees is the common method for addressing potential impacts to public schools in CEQA documents. While the number of students associated with the project would be higher than what was anticipated on the Level 1 Developer Fee Study, payment of impact fees per square foot of new residential construction would adequately address school service impacts.

Please let me know if you have questions or need further information to assist in addressing this matter. I can be reached via email at ryan@birdseyeplanninggroup.com or call 760-712-2199.

Regards,

Ryan Birdseye
Principal