Preliminary design and engineering for the physical, civil, and outdoor components.
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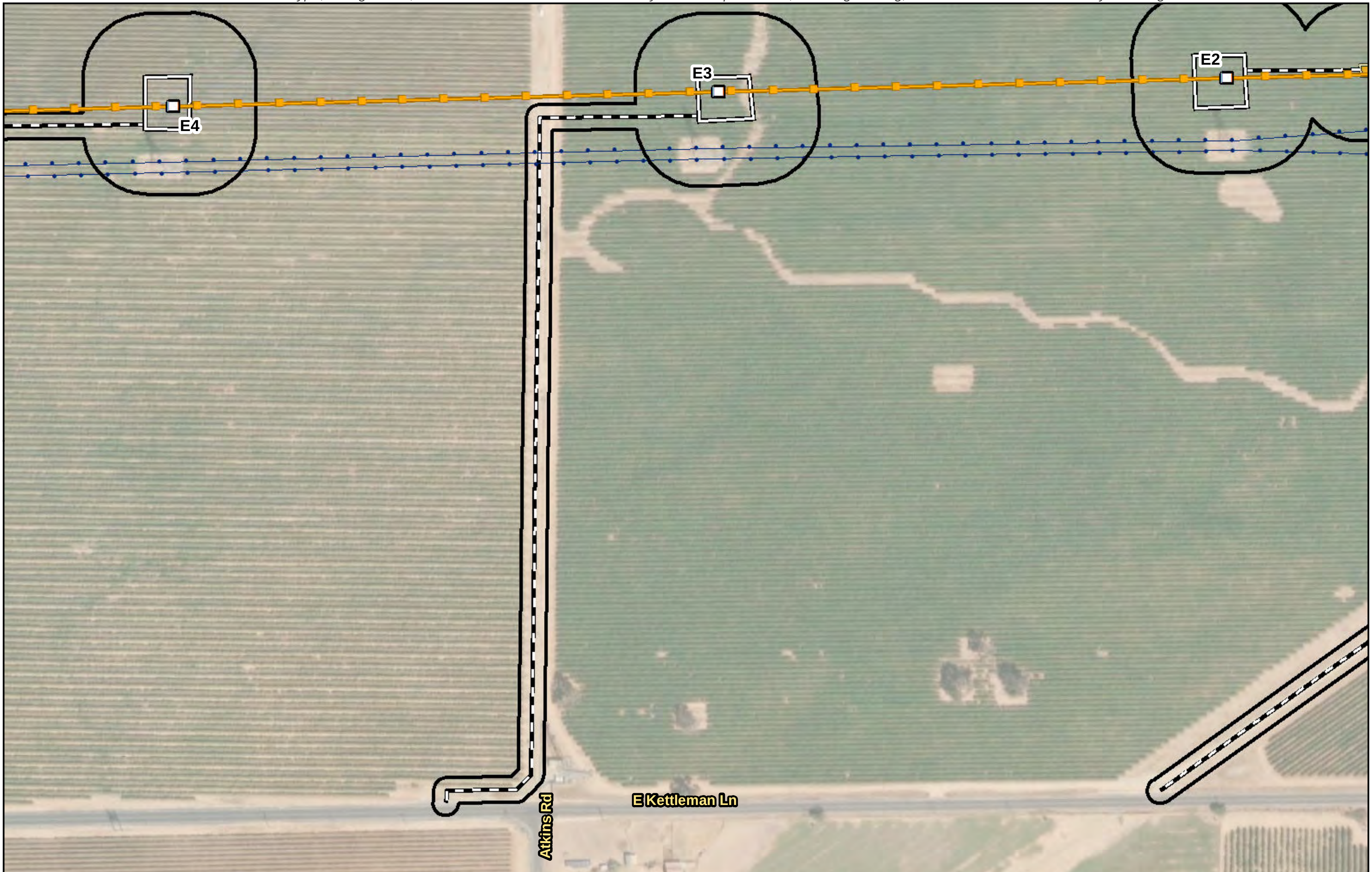
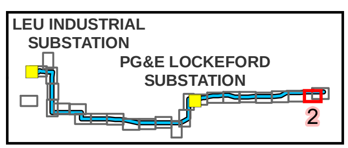


Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 2 of 26
Northern San Joaquin 230 kV Transmission Project

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Preliminary design and engineering for the physical, civil, and outdoor components.
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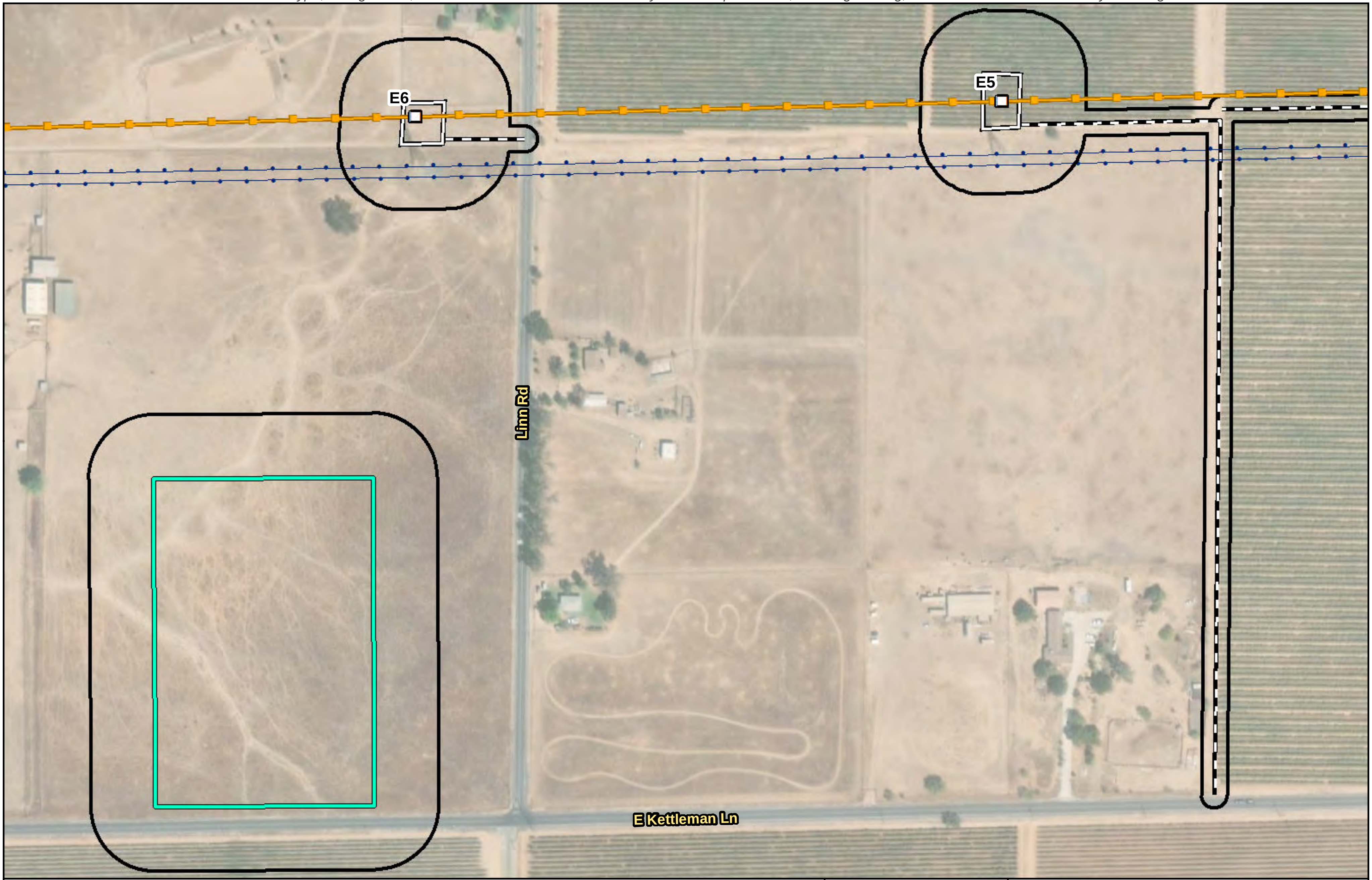

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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- Existing 230 kV Transmission Line

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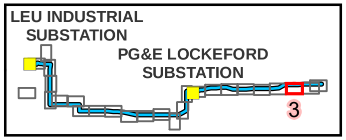
- Proposed Staging Area



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 3 of 26
Northern San Joaquin 230 kV Transmission Project

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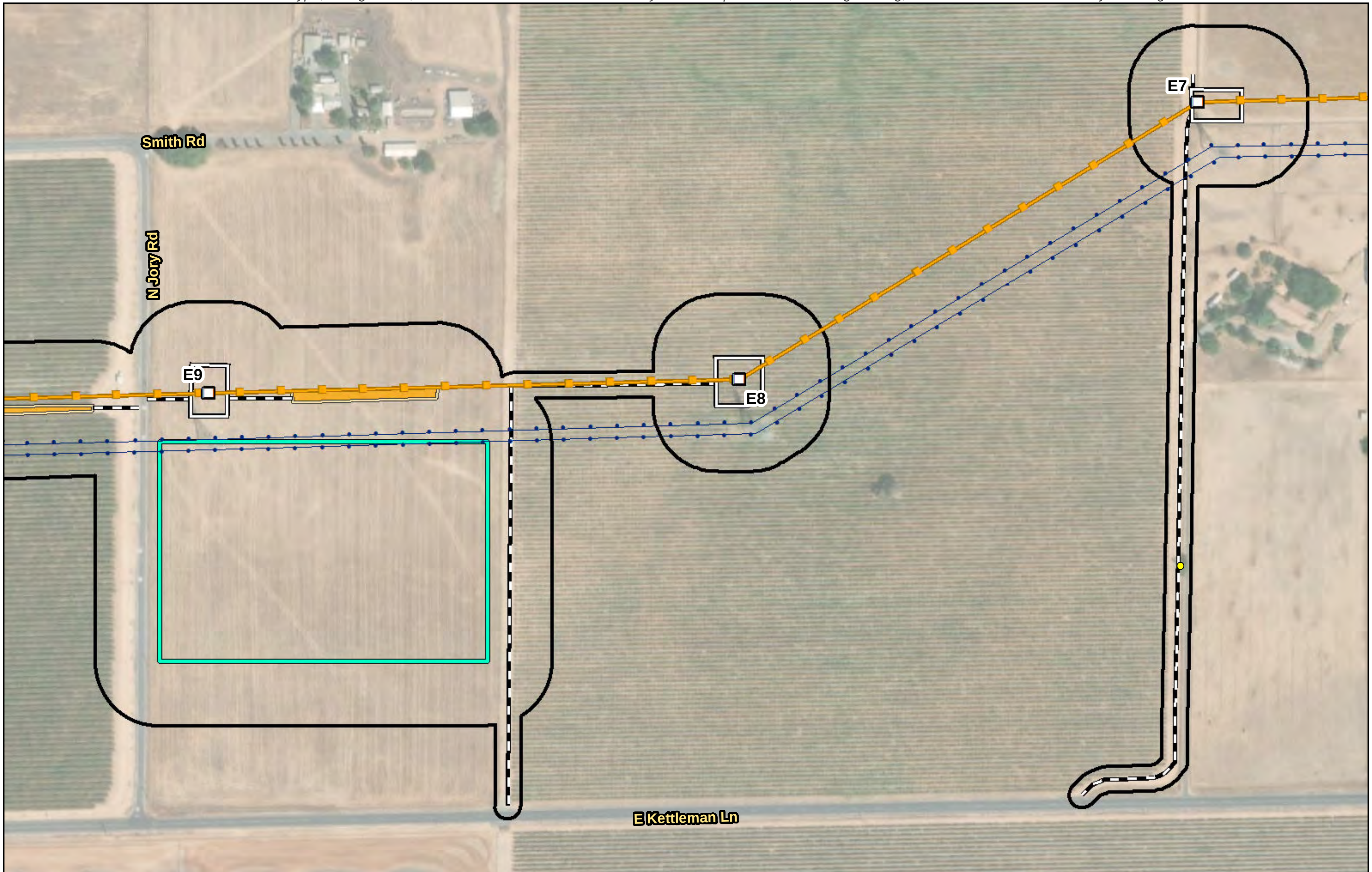

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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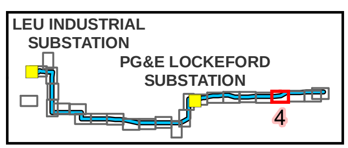
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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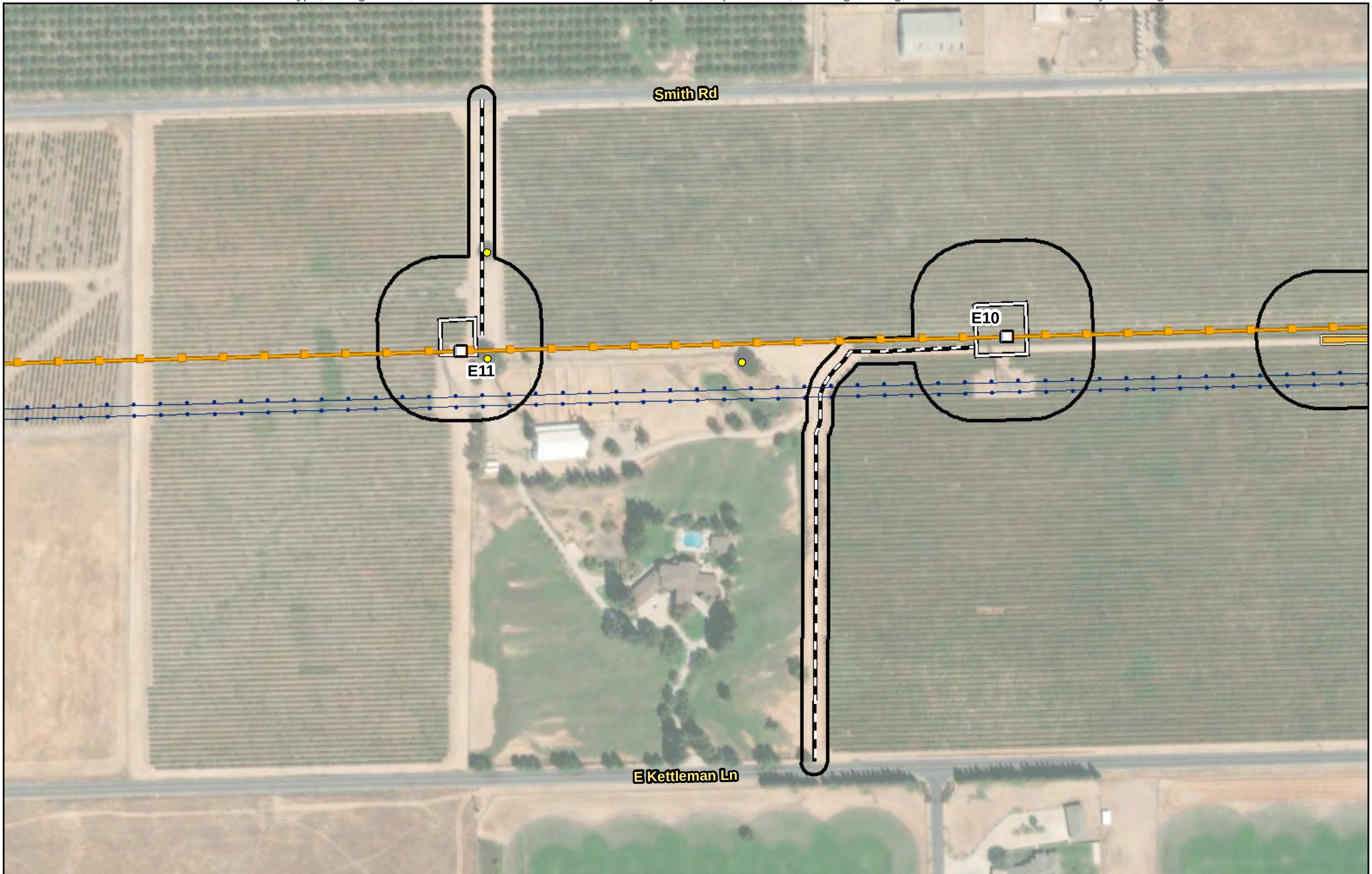
Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 4 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

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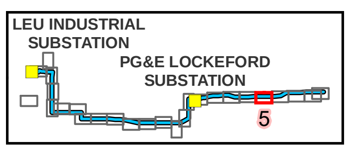
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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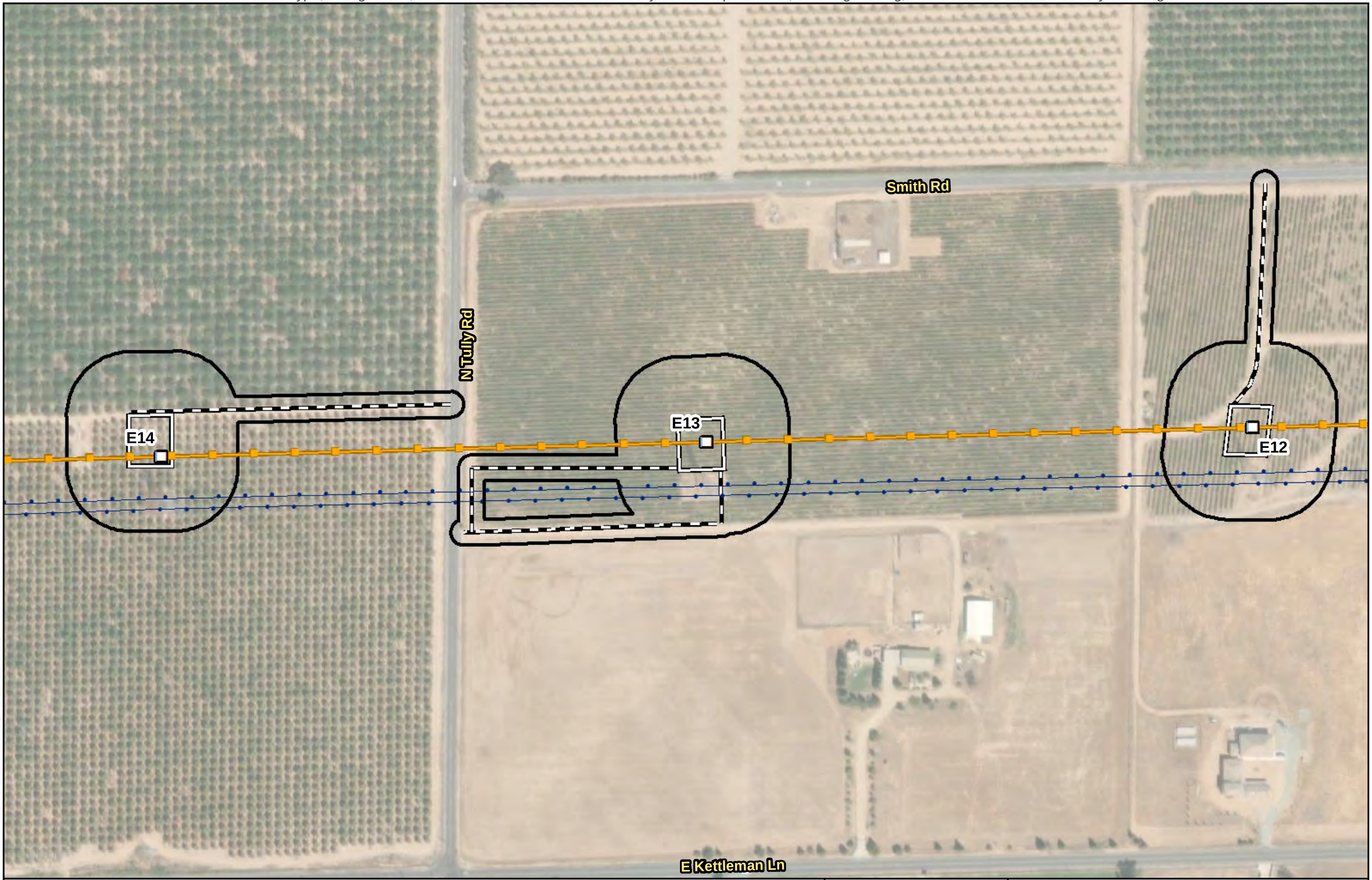
Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 5 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

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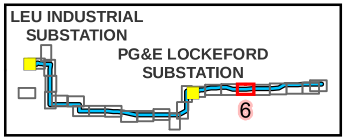
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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FIGURE 2
Project Elements and Biological Study Area
Page 6 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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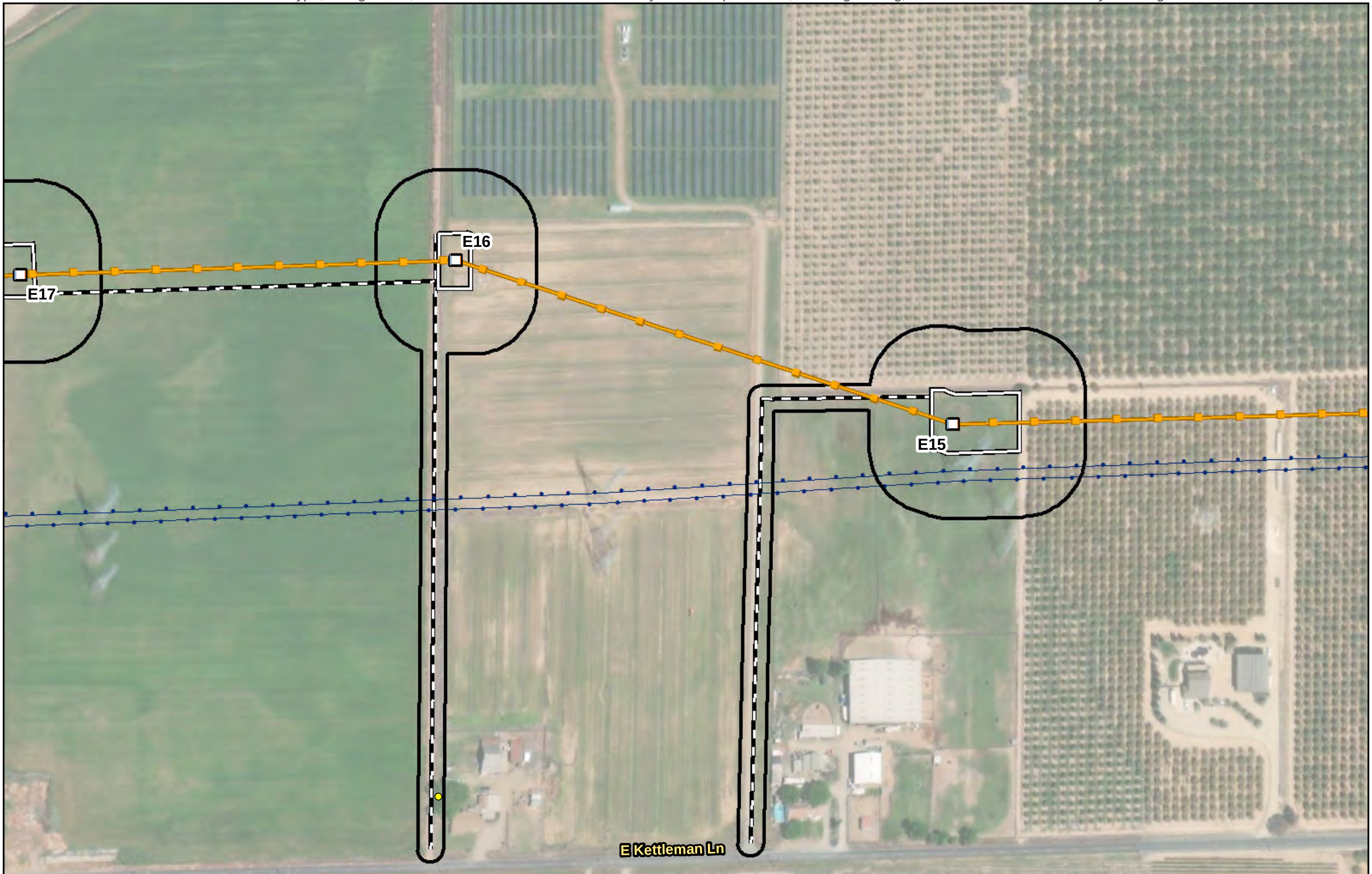

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
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Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
7

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 7 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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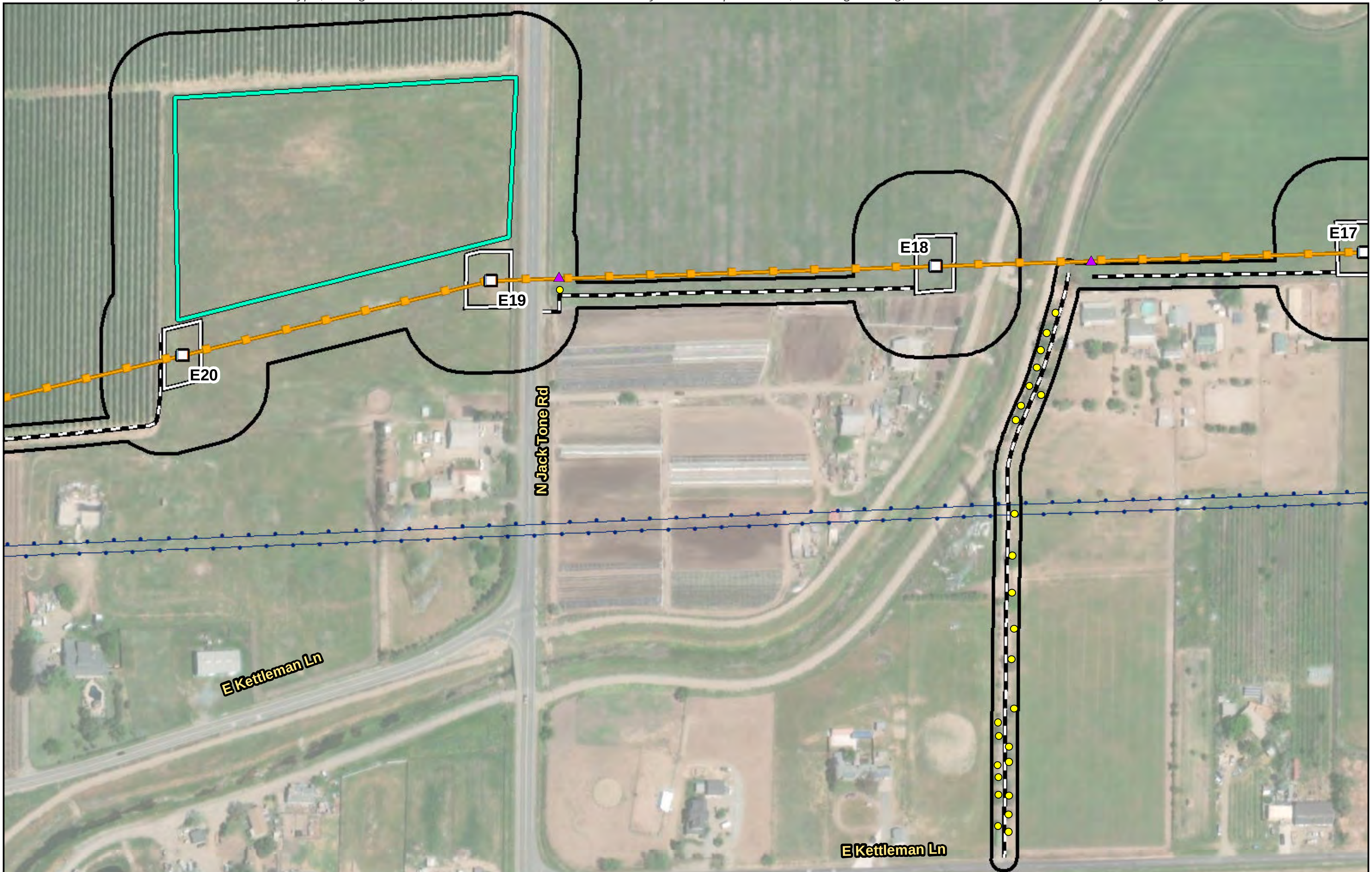

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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- Existing 230 kV Transmission Line

Proposed Impact Areas

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- Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
8

Source:
1) Esri World Imagery

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N

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 8 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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Preliminary design and engineering for the physical, civil, and outdoor components.
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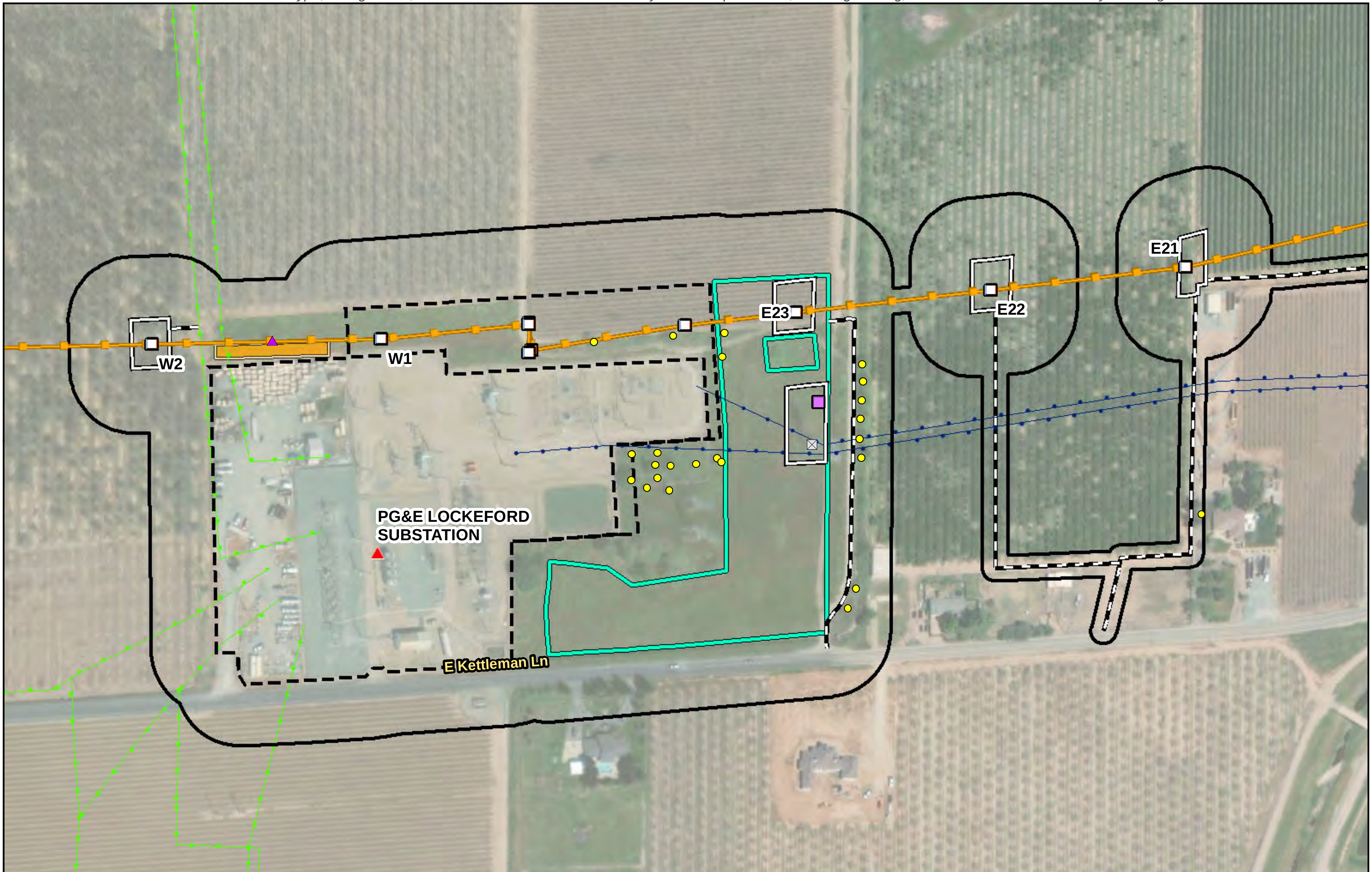

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
9

Source:
1) Esri World Imagery

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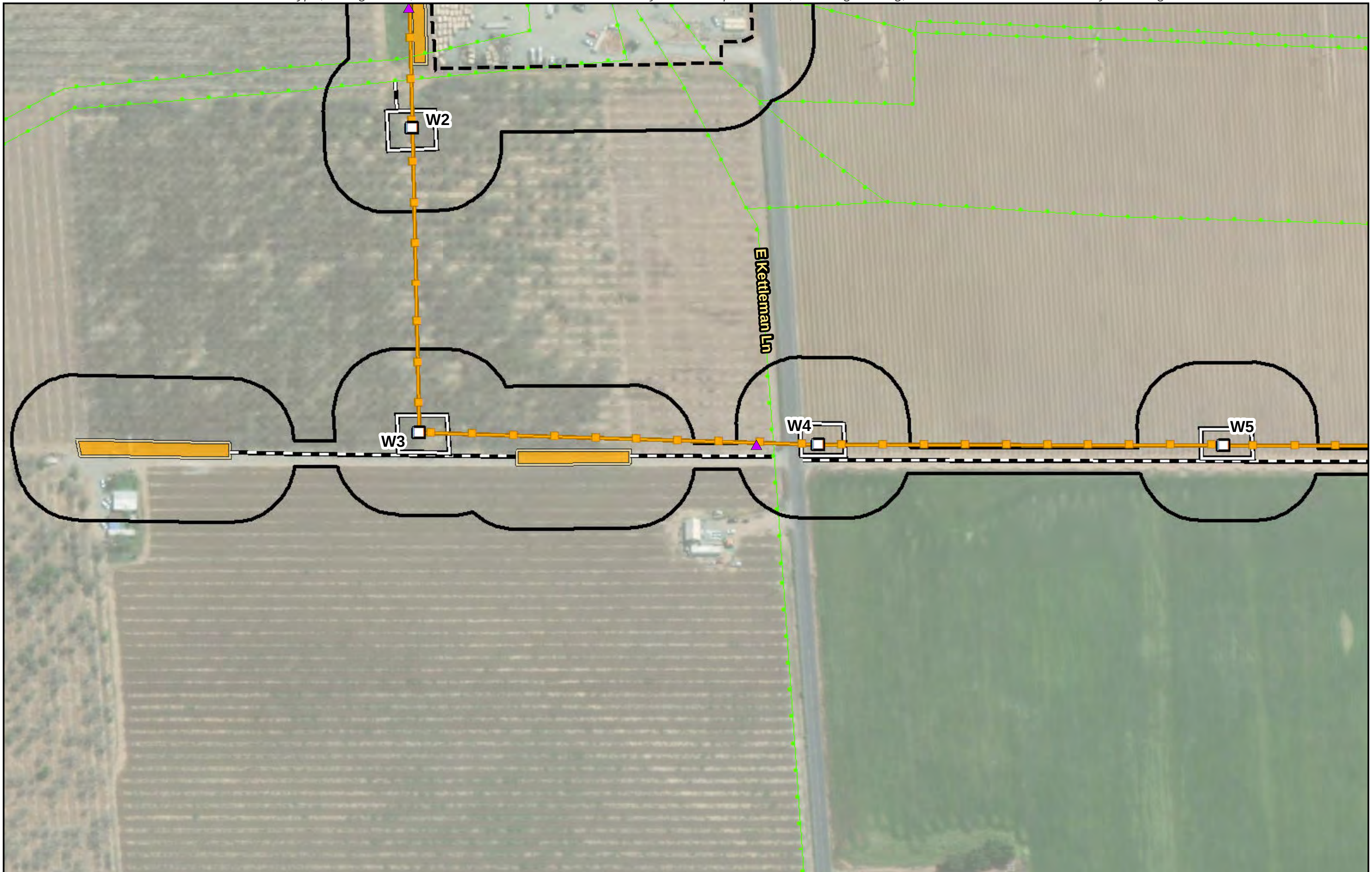
Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 9 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
10

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 10 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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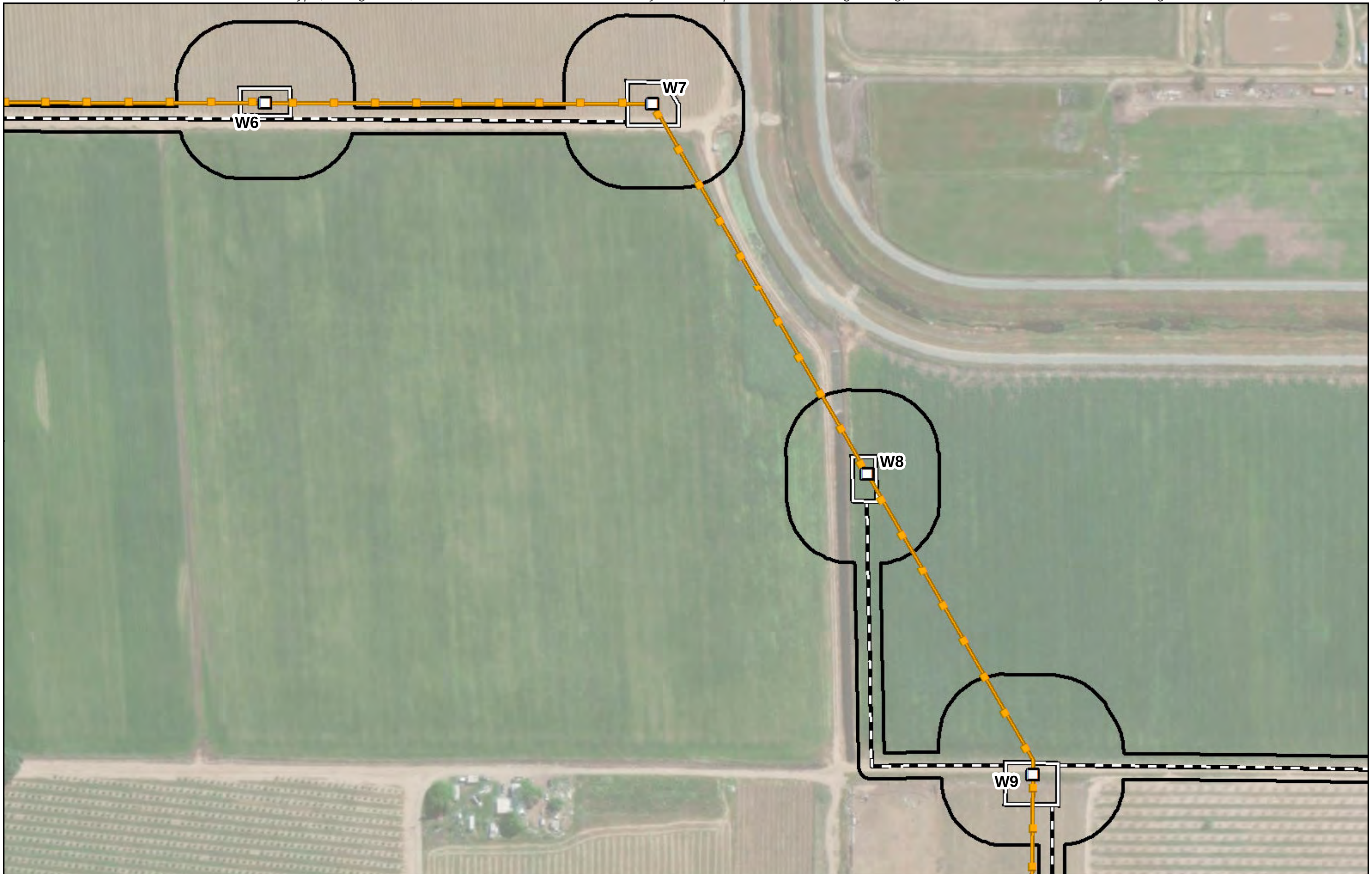

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
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Existing Guy Stub Pole: Remove

Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
11

Source:
1) Esri World Imagery

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0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 11 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
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Existing Guy Stub Pole: Remove

Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal

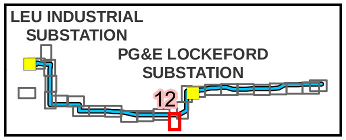

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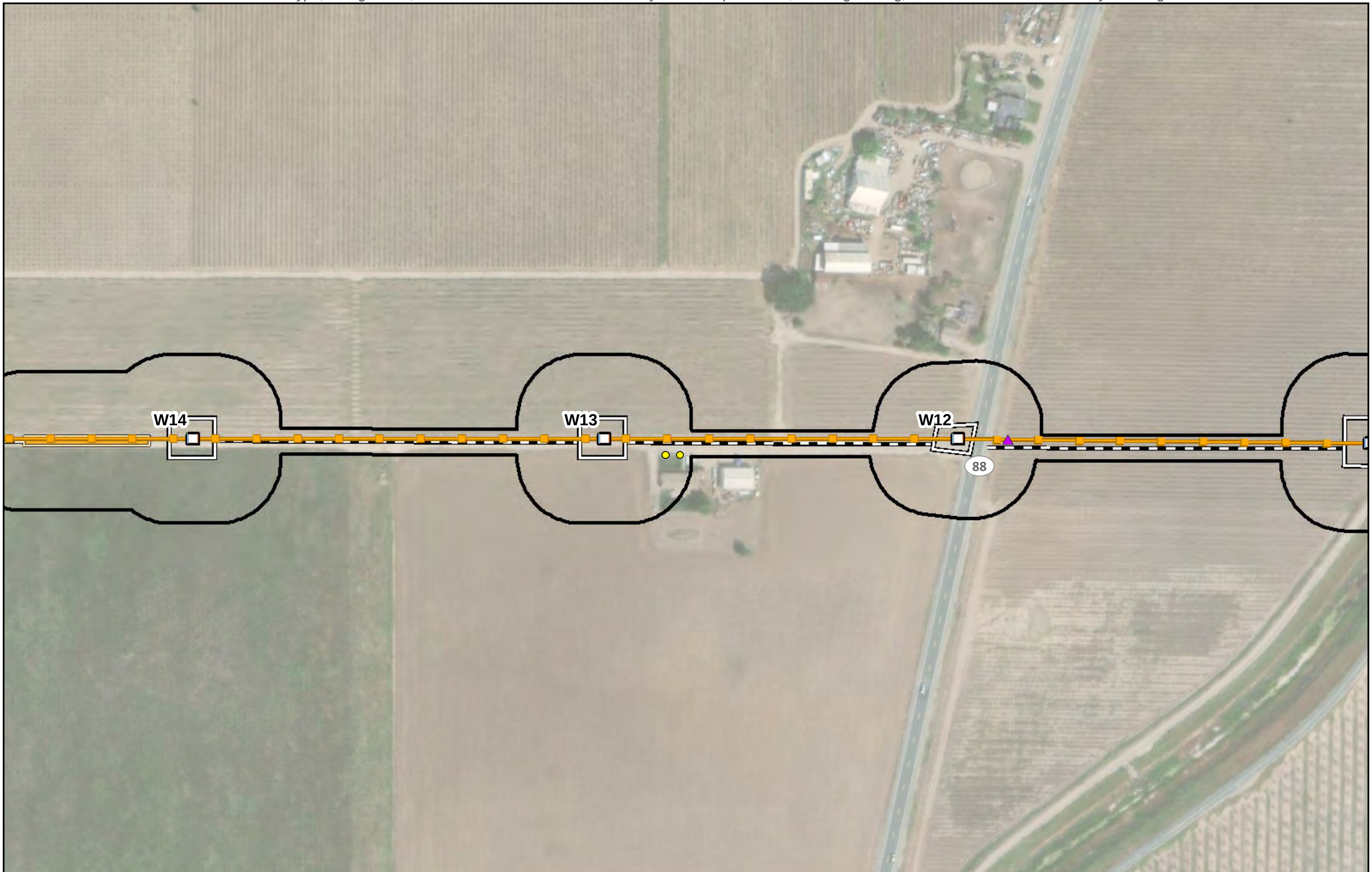
FIGURE 2
Project Elements and Biological Study Area
Page 12 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
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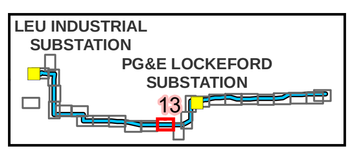
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 13 of 26
Northern San Joaquin 230 kV Transmission Project

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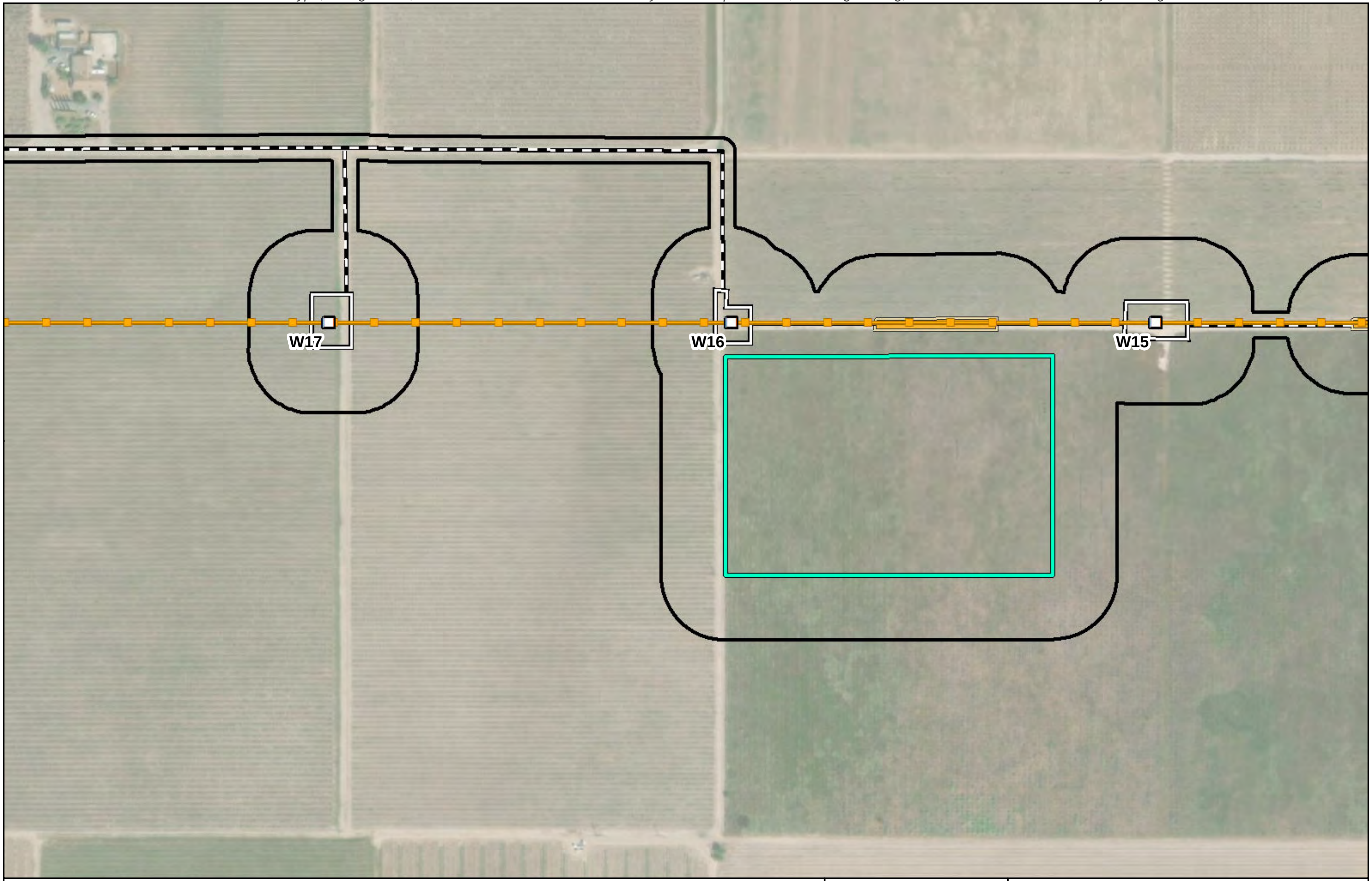

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
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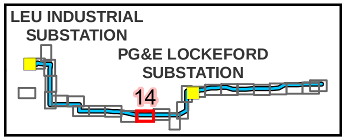

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 14 of 26
Northern San Joaquin 230 kV Transmission Project

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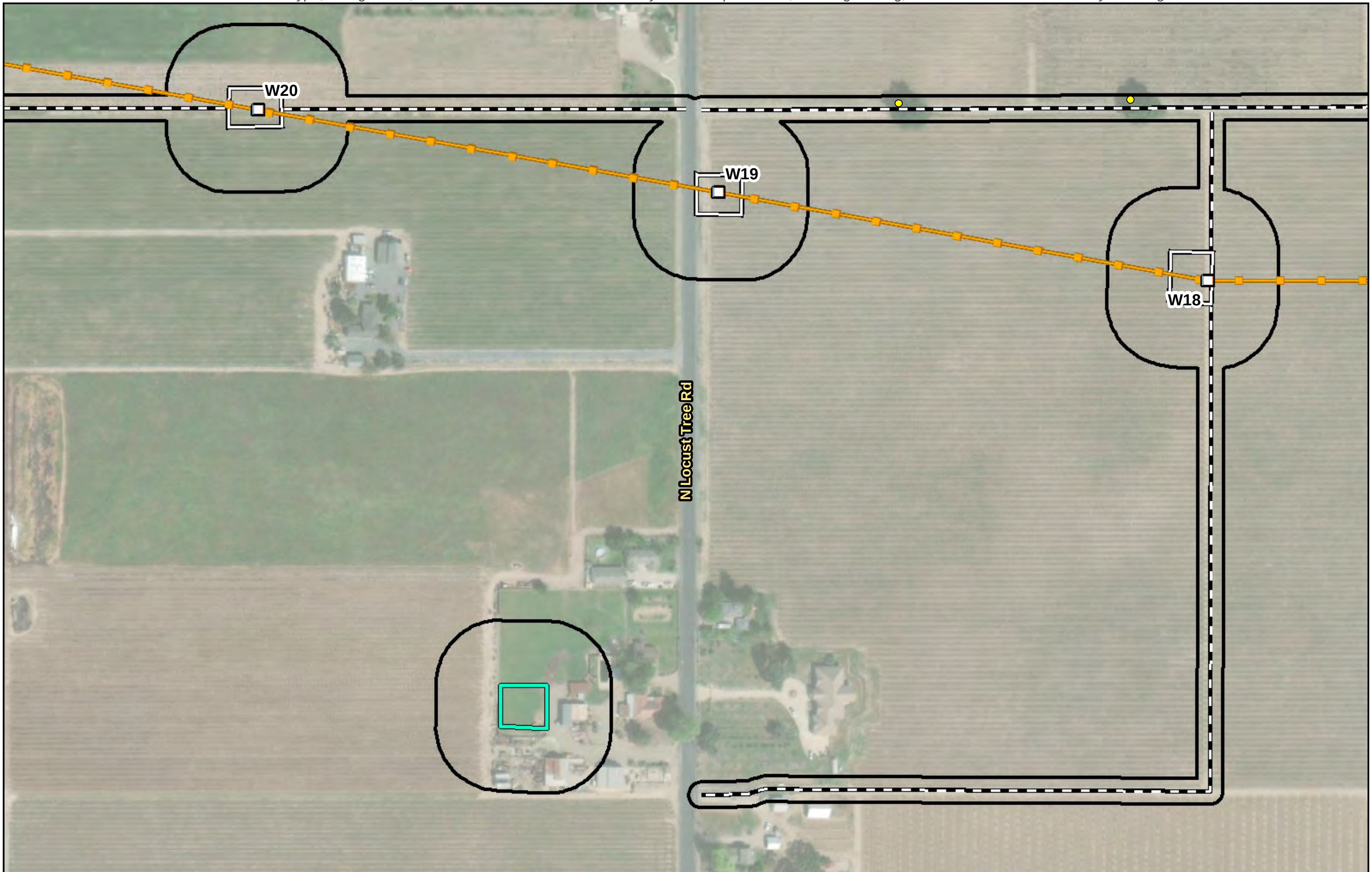

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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Proposed Impact Areas

- Proposed Structure
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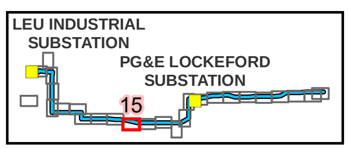
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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FIGURE 2
Project Elements and Biological Study Area
Page 15 of 26
Northern San Joaquin 230 kV Transmission Project

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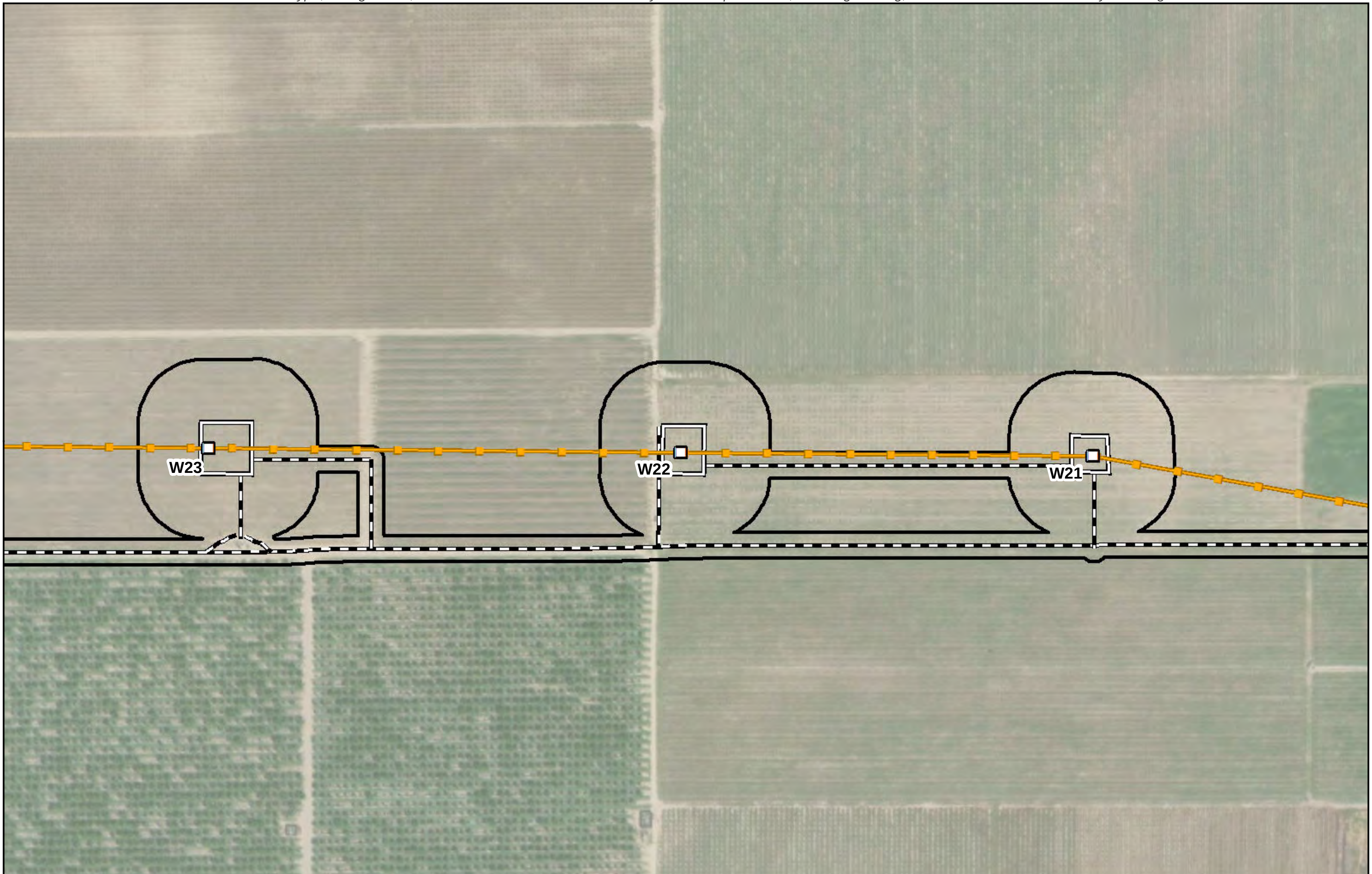

Legend

- Biological Study Area (387.06 acres)
- Substation
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Proposed Impact Areas

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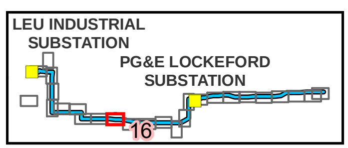

Source:
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FIGURE 2
Project Elements and Biological Study Area
Page 16 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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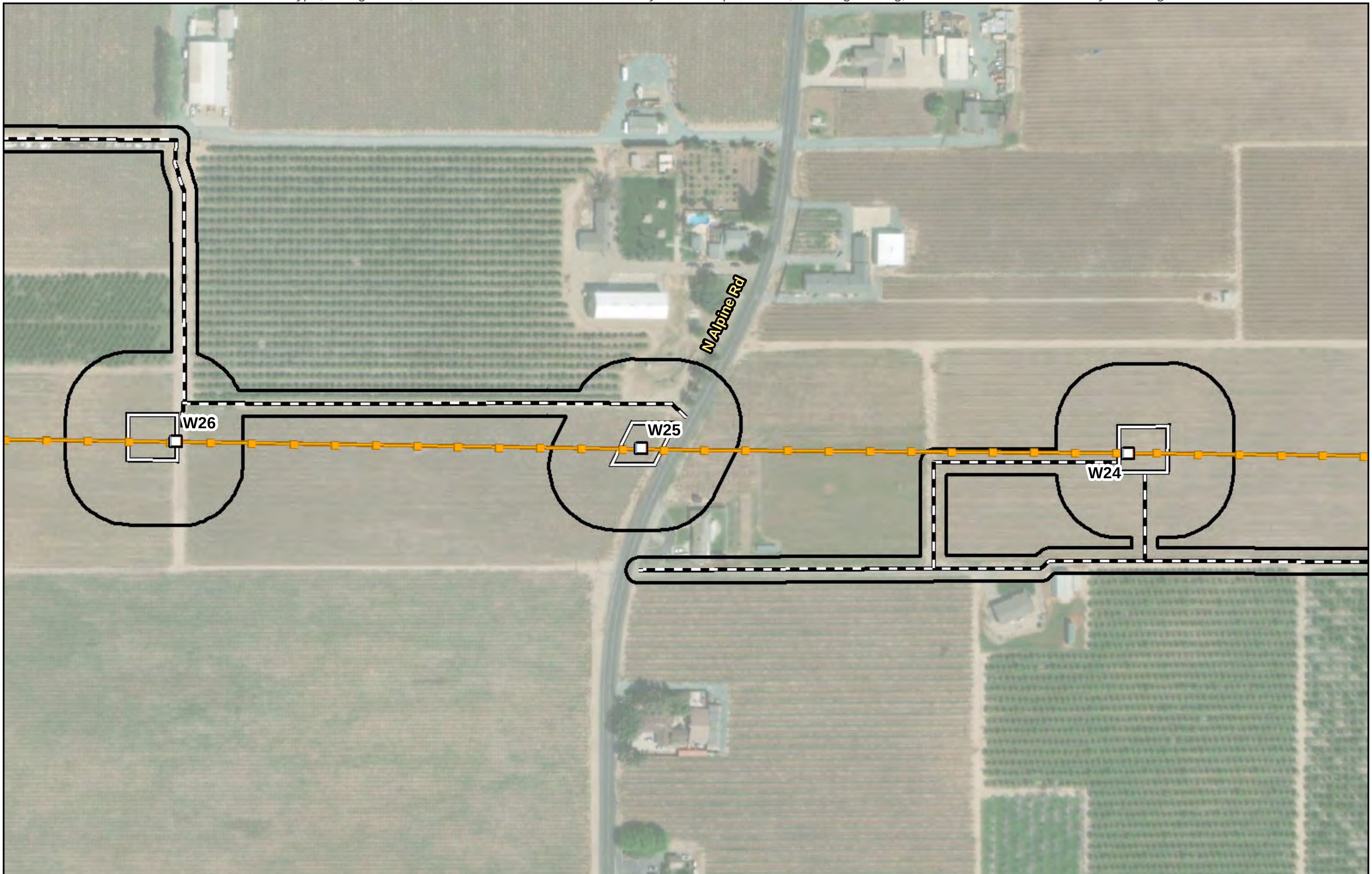

Legend

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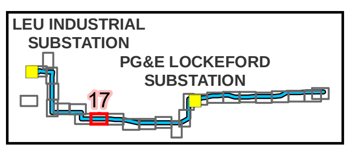

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 17 of 26
Northern San Joaquin 230 kV Transmission Project

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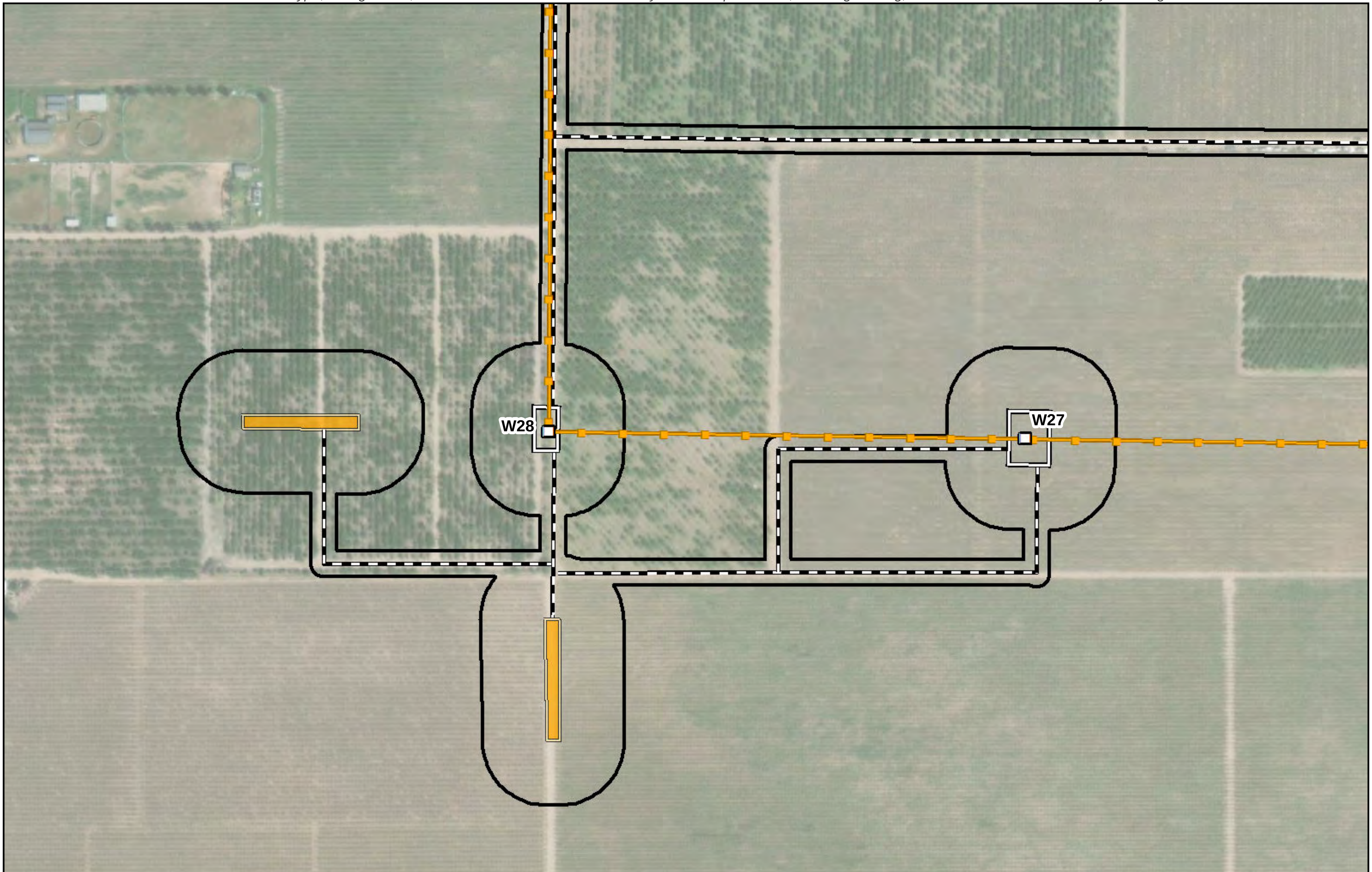

Legend

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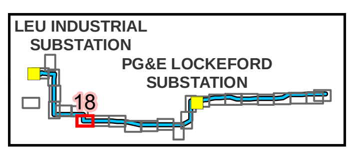

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 18 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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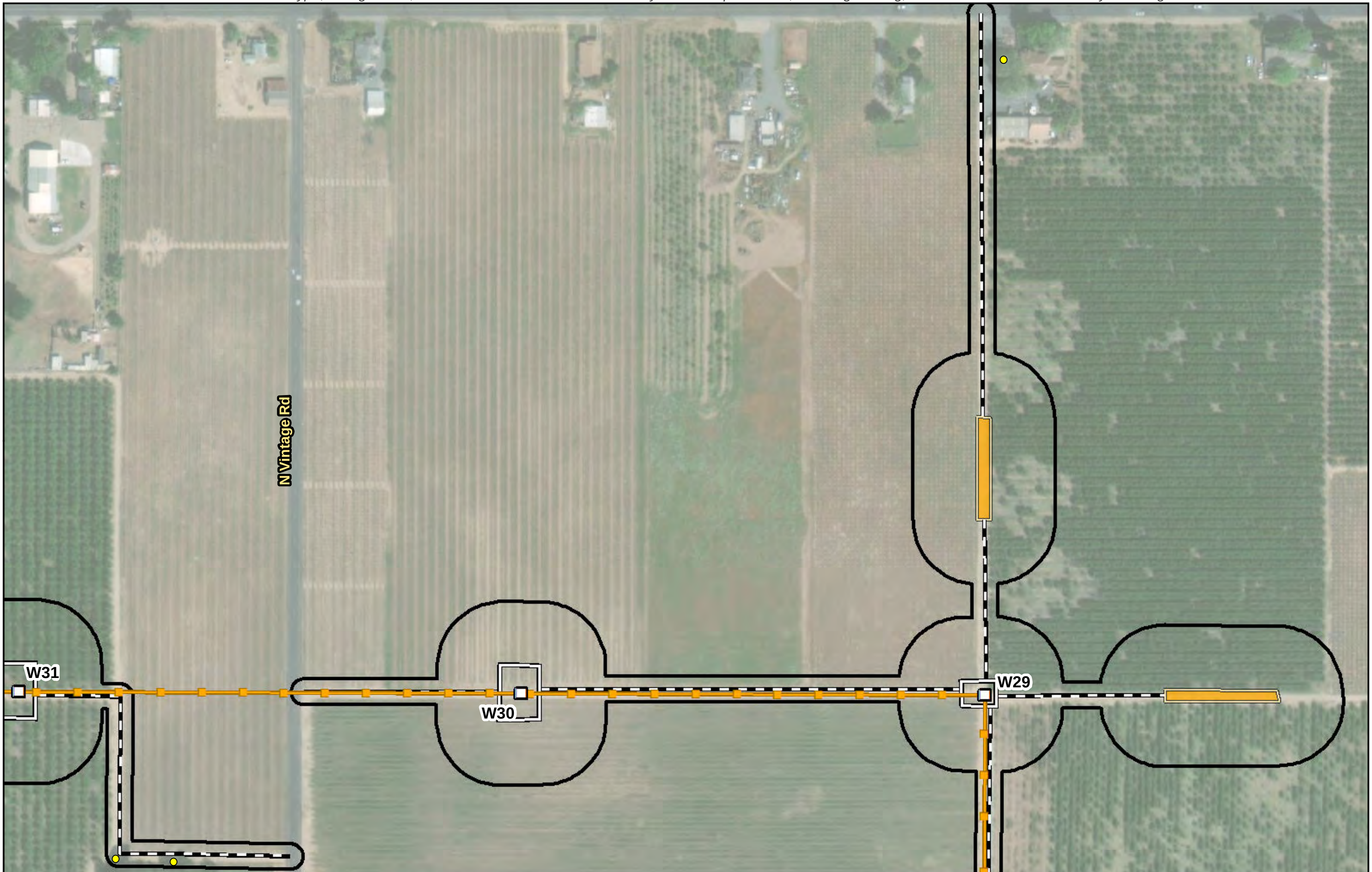

Legend

- Biological Study Area (387.06 acres)
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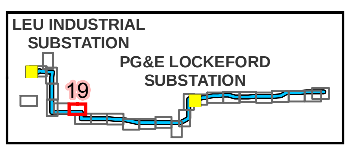
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

0 100 Feet

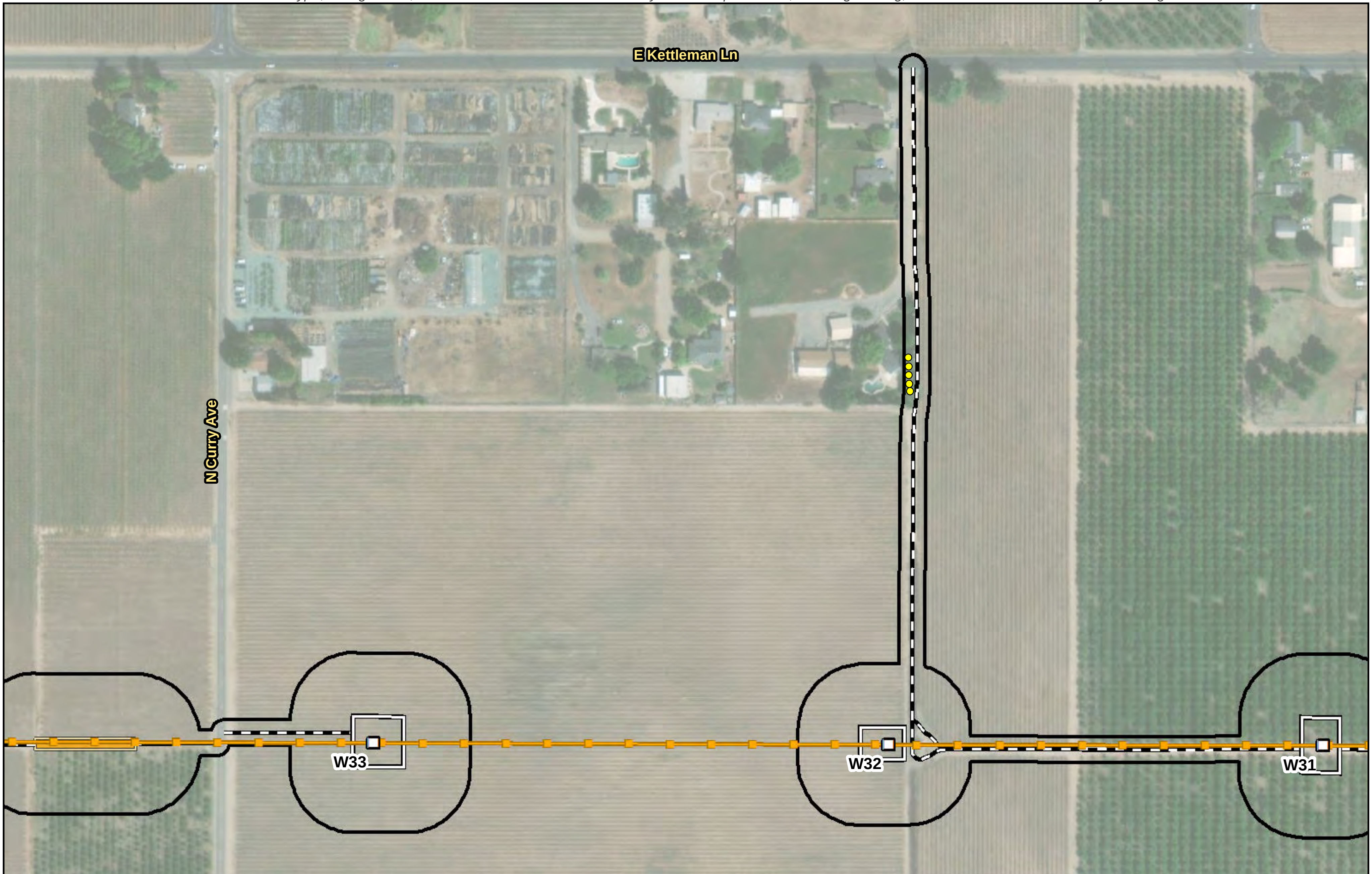
N

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 19 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_2_230817.mxd kgrant1 8/21/2023

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

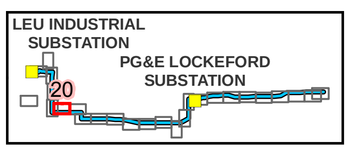


Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

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0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 20 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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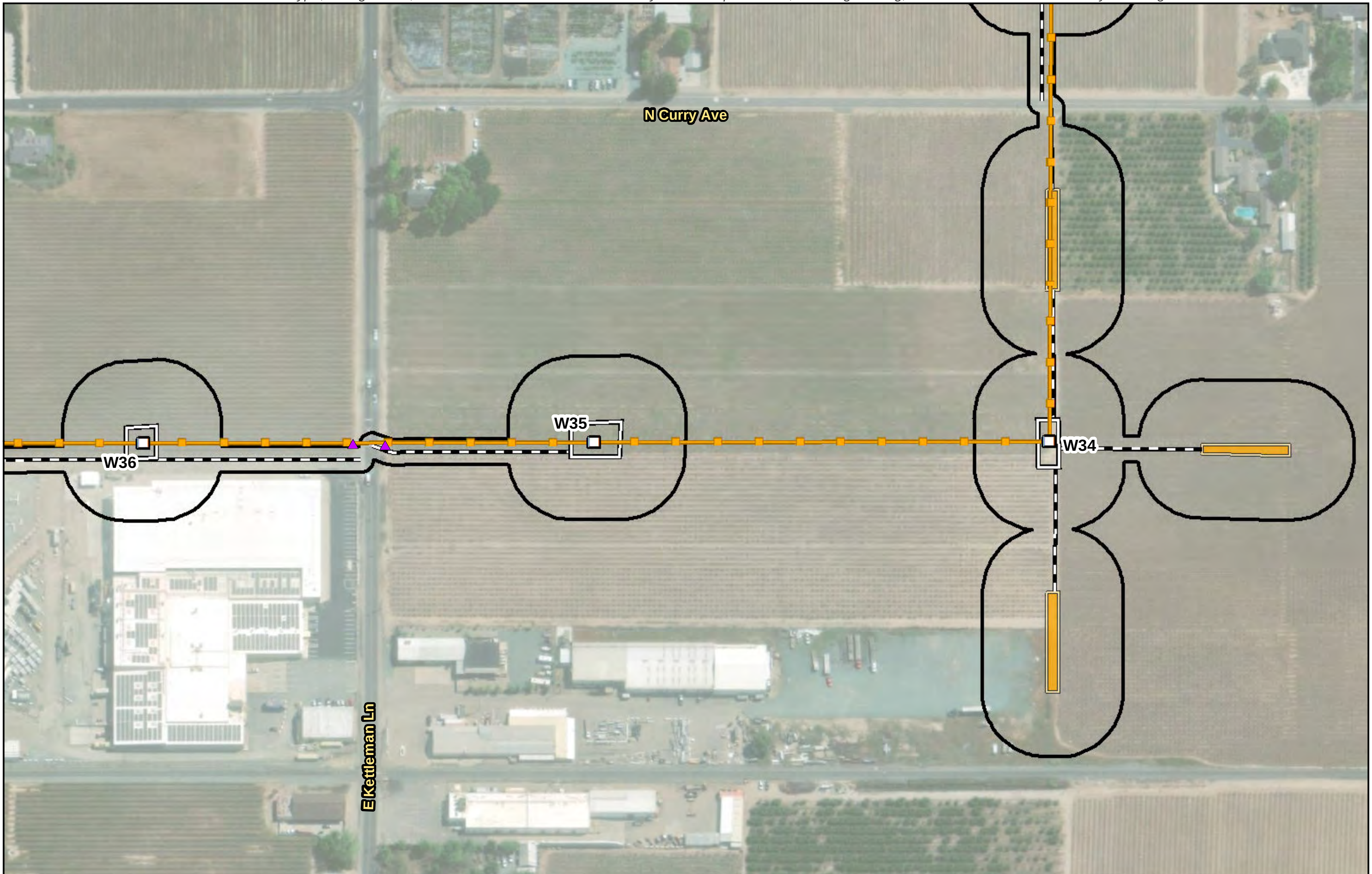

Legend

- Biological Study Area (387.06 acres)
- Substation
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- Existing 230 kV Transmission Line

Proposed Impact Areas

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- Proposed Pull Site
- Proposed Fenceline
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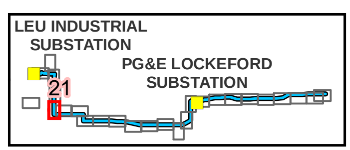

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 21 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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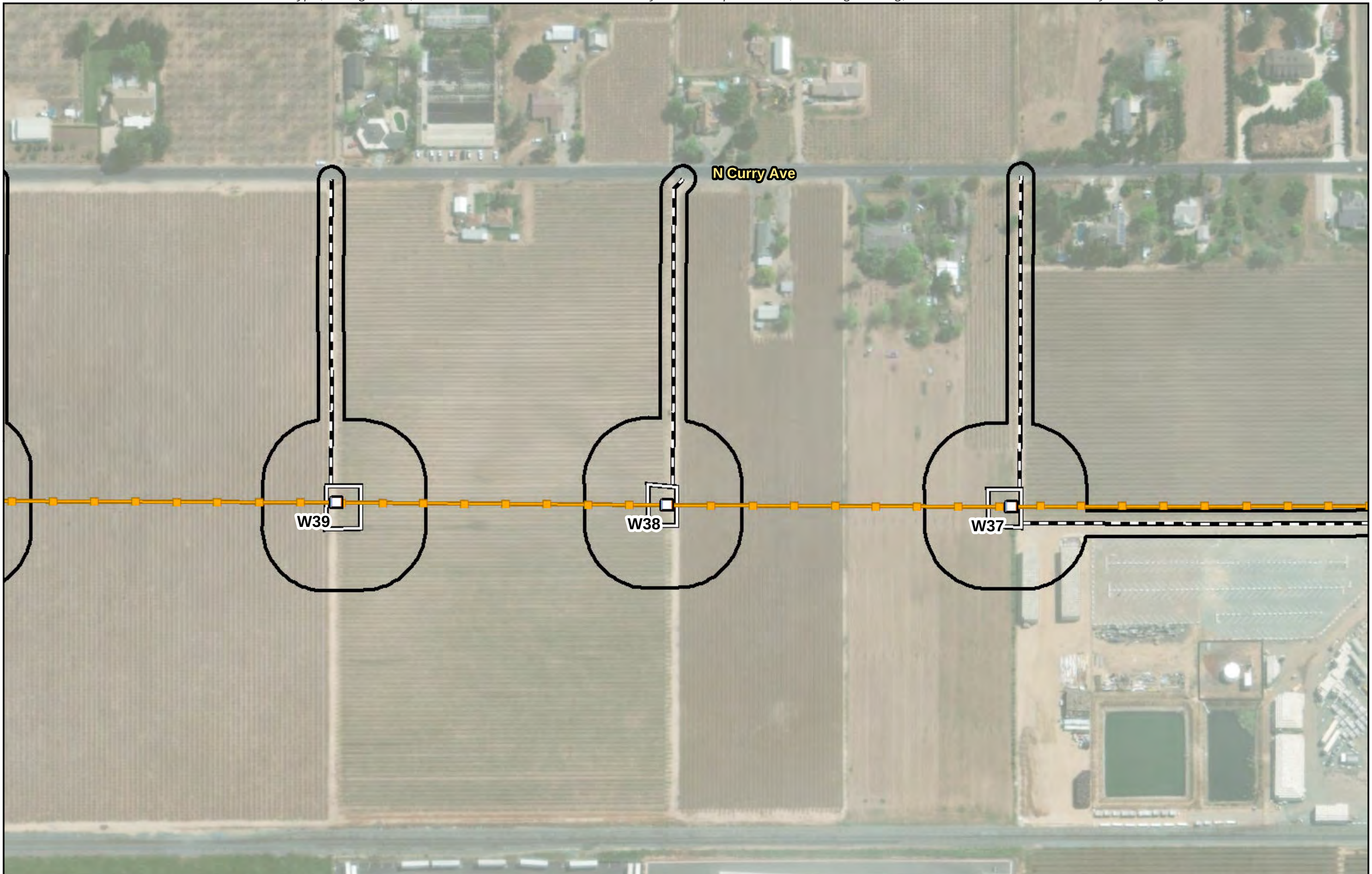

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

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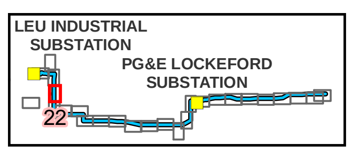
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
1) Esri World Imagery

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0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 22 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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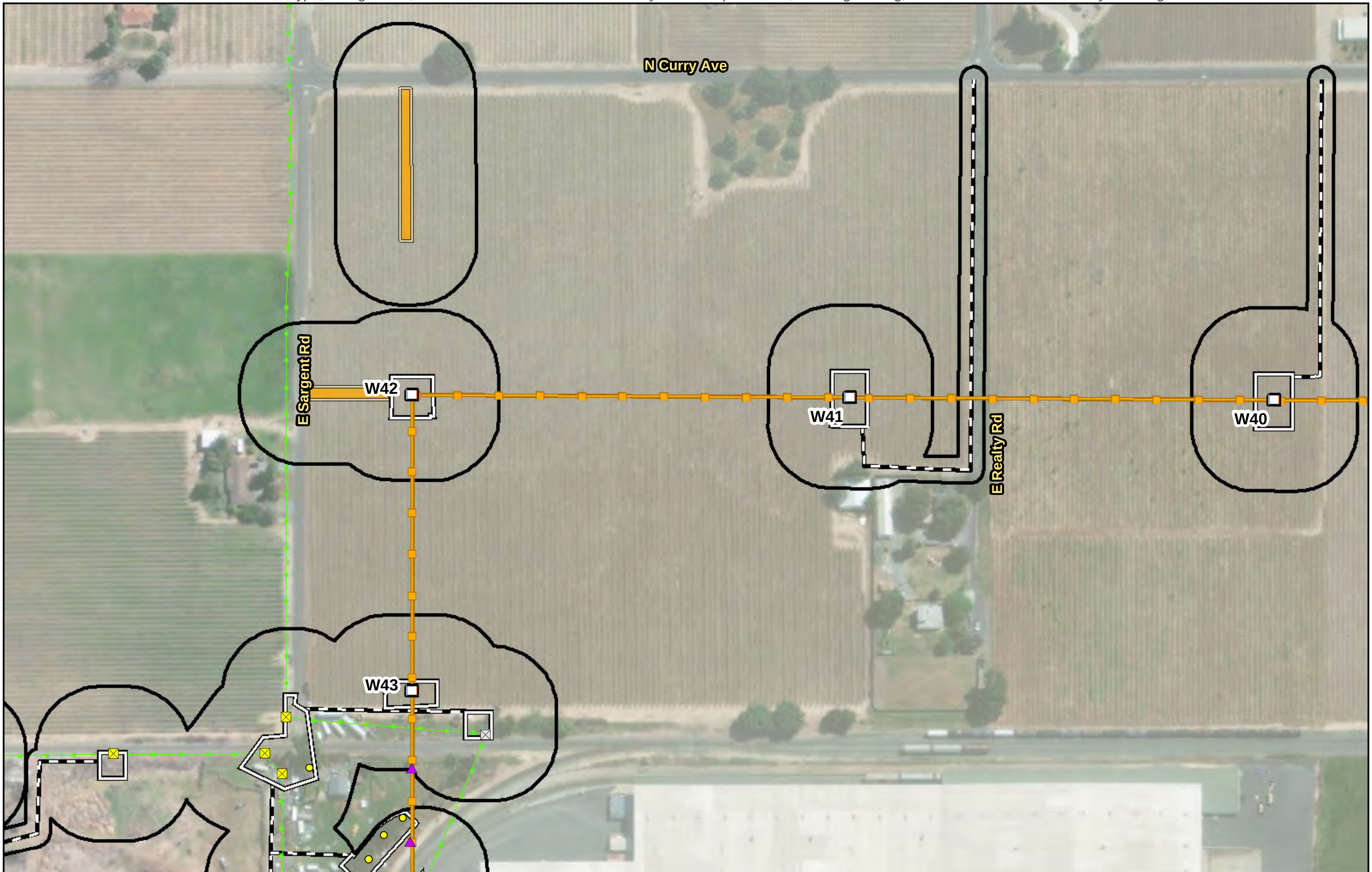

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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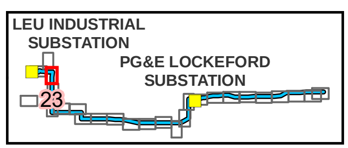
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 23 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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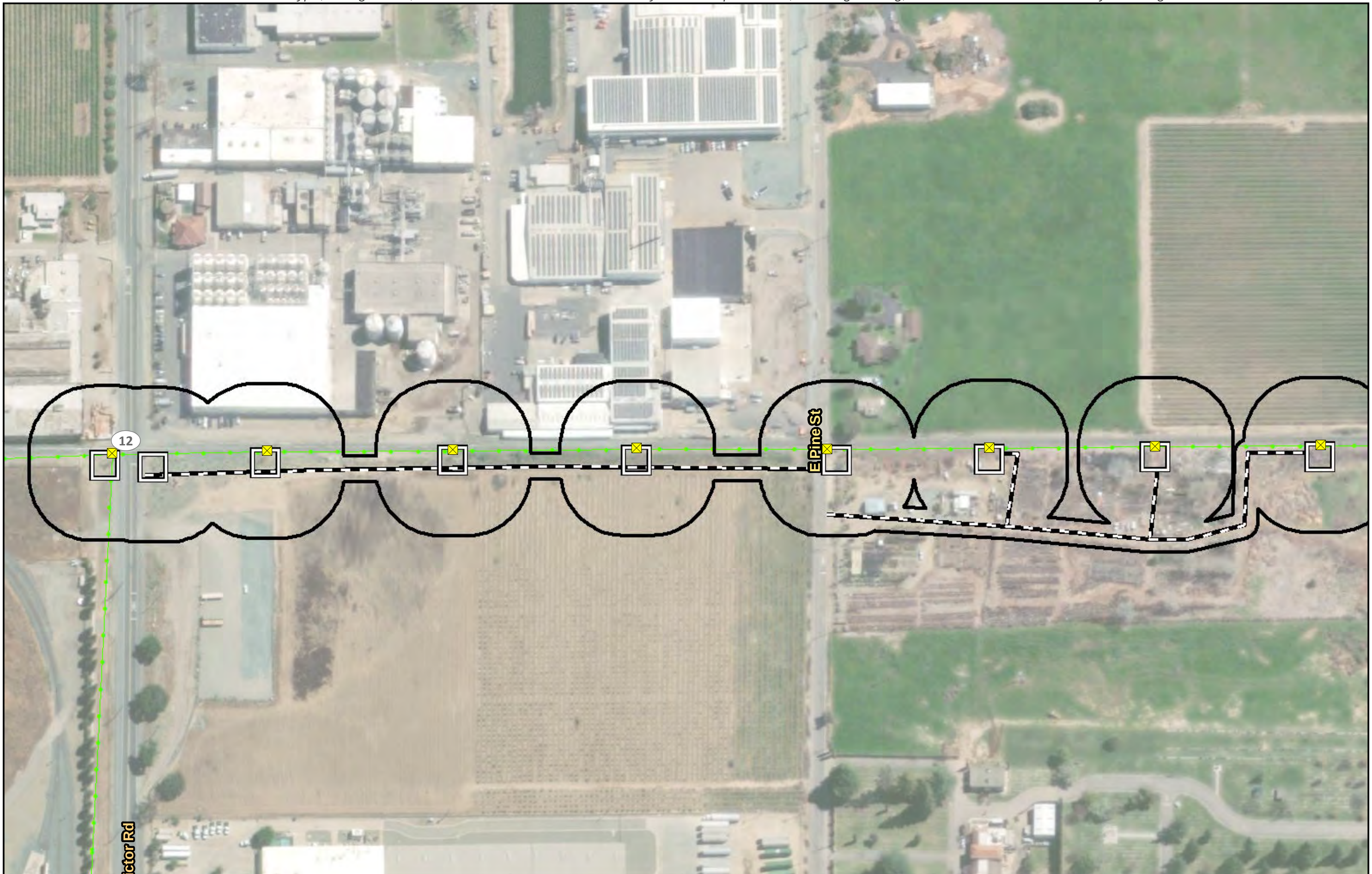


Legend

Biological Study Area (387.06 acres)

Substation

PG&E New 230 kV Transmission Line

Existing 60 kV Power Line

Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure

RO-L1 Proposed TSP

Structure: Modify or Replace

Structure: Remove

Existing Guy Stub Pole: Remove

Potential Guard Structure Area

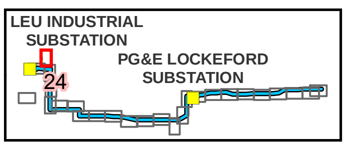
Proposed Access Route

Proposed Work Area

Proposed Pull Site

Proposed Fenceline

Proposed Staging Area



Source:
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0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 24 of 26
Northern San Joaquin 230 kV Transmission Project

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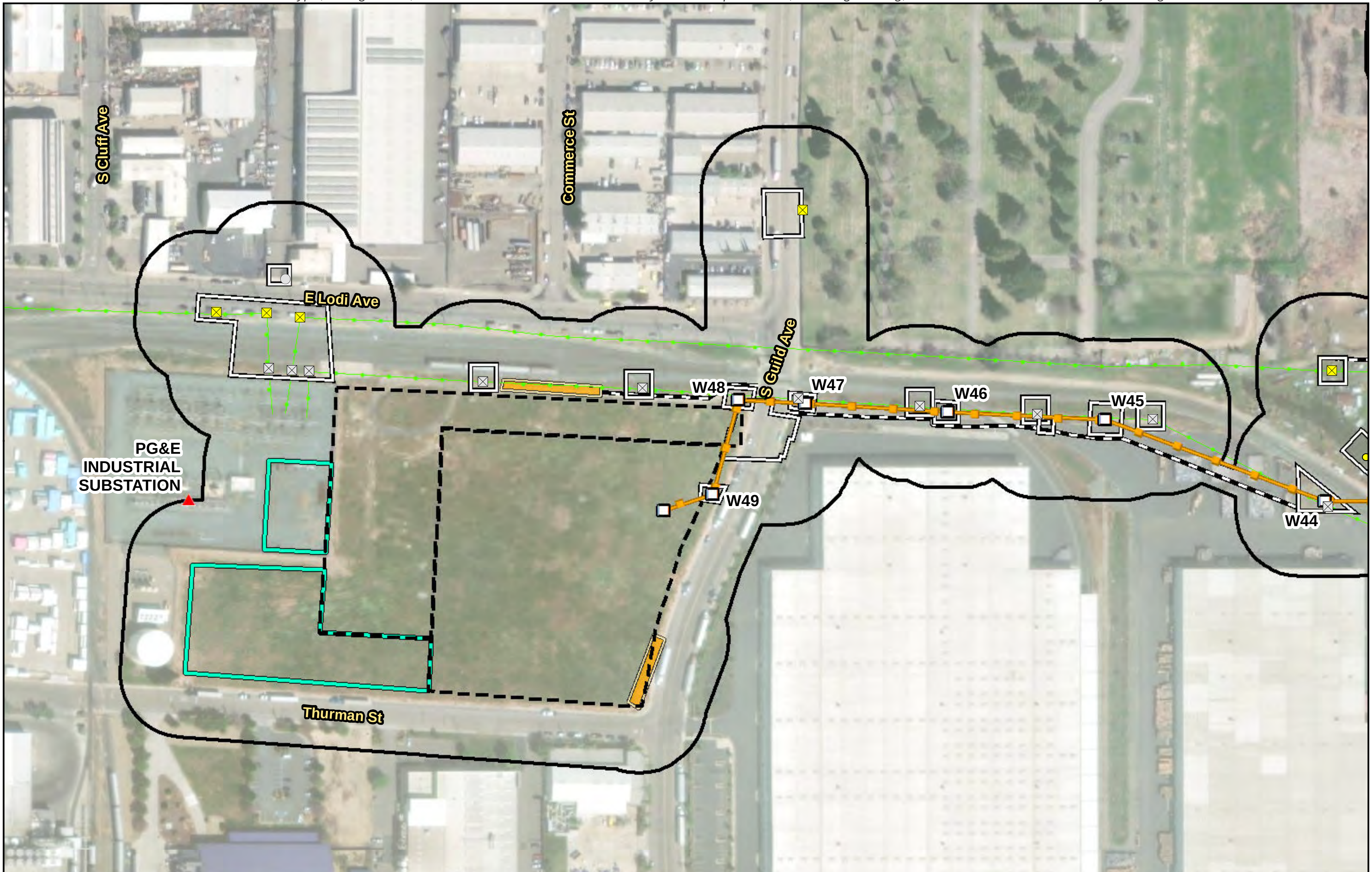

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
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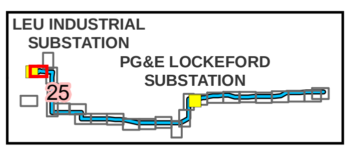
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

0 100
Feet

N

Scale:
1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 25 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_2_230817.mxd kgrant1 8/21/2023

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

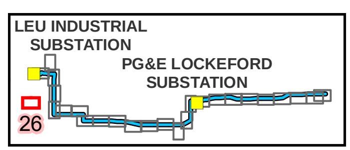
Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove

Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area



Source:
1) Esri World Imagery

0 100 Feet

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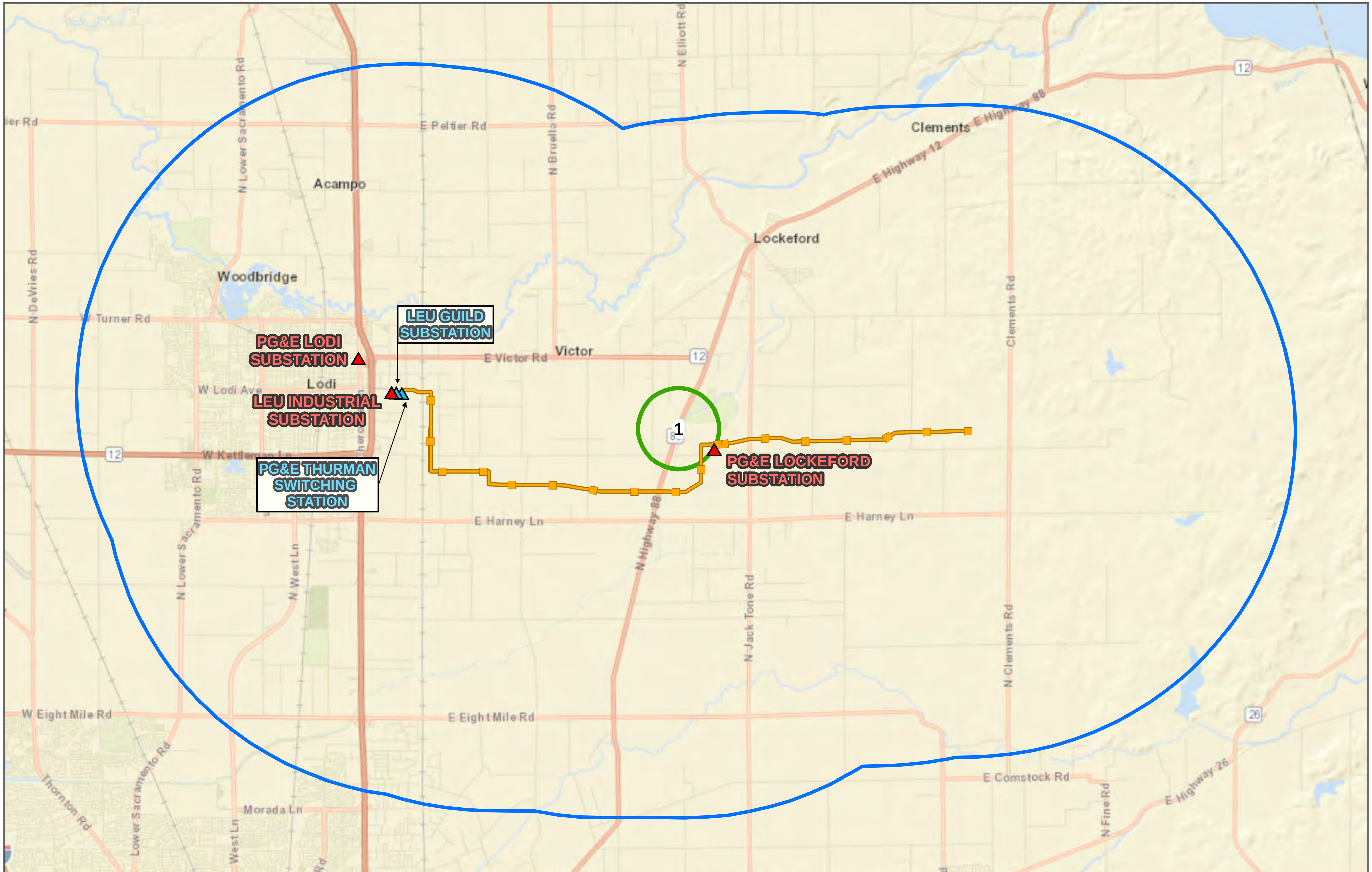
Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 26 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_2_230817.mxd kgrant1 8/21/2023

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors



Legend

- Exsting Substation
- New Substation/ Switching Station
- PG&E New 230 kV Transmission Line
- 5-mile Project Buffer
- CNDDB Records within 5 Miles of the Project Area

CNDDB Record Labels

1. Sanford's arrowhead

Source:
1) ESRI World Street Map
2) CDFW, California Natural Diversity Database, December 2020.

0 8,400 16,800 Feet

N

Scale: 1:125,000

Project Location

Figure 3
CNDDB Records within 5 Miles of the Project Area - Plants
Northern San Joaquin 230 kV Transmission Project

Jacobs

\\dc1vs01\GISProj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_3_210924.mxd kgrant1 9/21/2022

Preliminary design and engineering for the physical, civil, and outdoor components.
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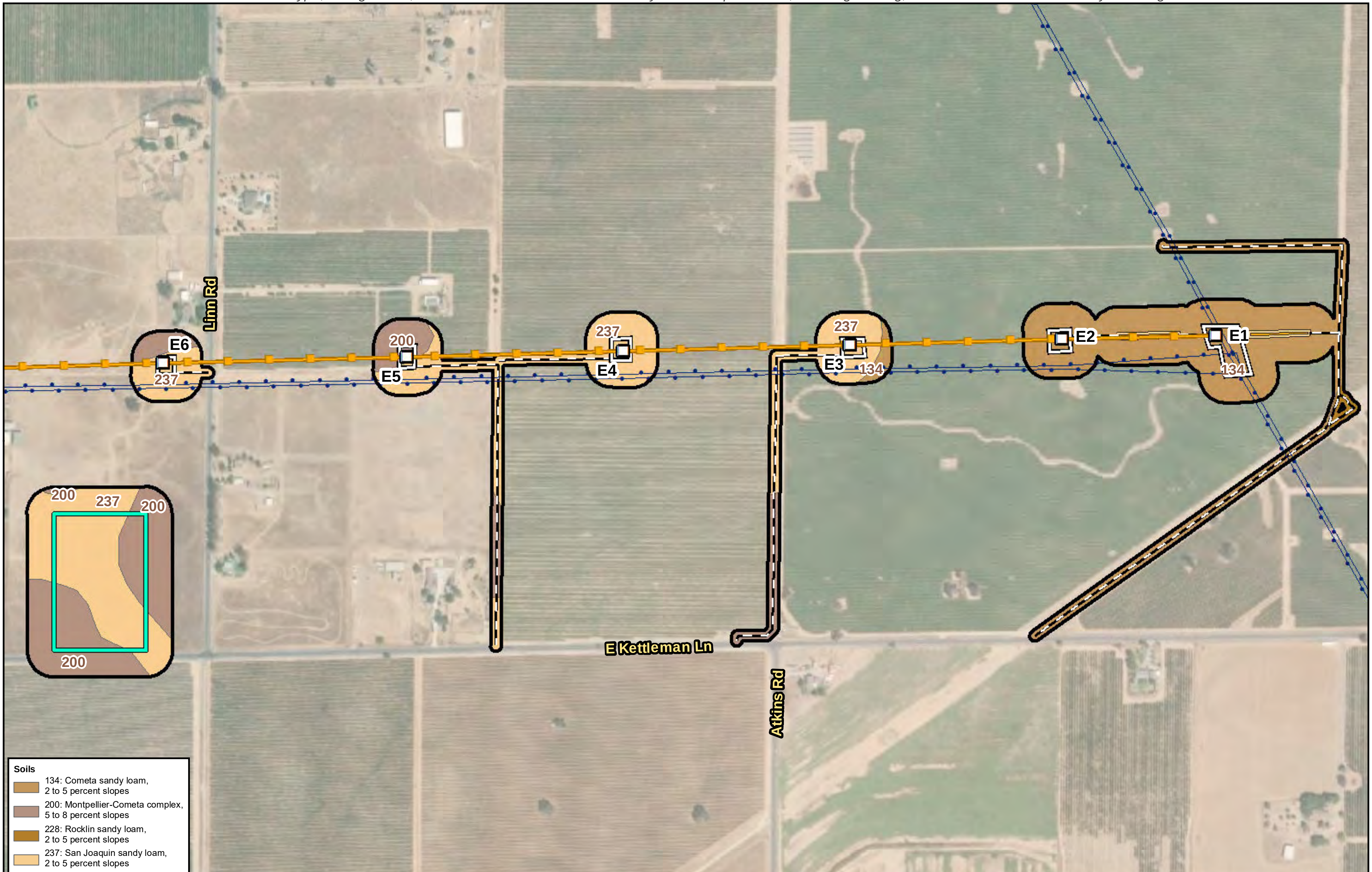

Soils

- 134: Cometa sandy loam, 2 to 5 percent slopes
- 200: Montpellier-Cometa complex, 5 to 8 percent slopes
- 228: Rocklin sandy loam, 2 to 5 percent slopes
- 237: San Joaquin sandy loam, 2 to 5 percent slopes

Legend

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- Substation
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Proposed Impact Areas

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- Proposed Fenceline
- Proposed Staging Area

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
1

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 1 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_4_230818.mxd kgrant1 8/18/2023

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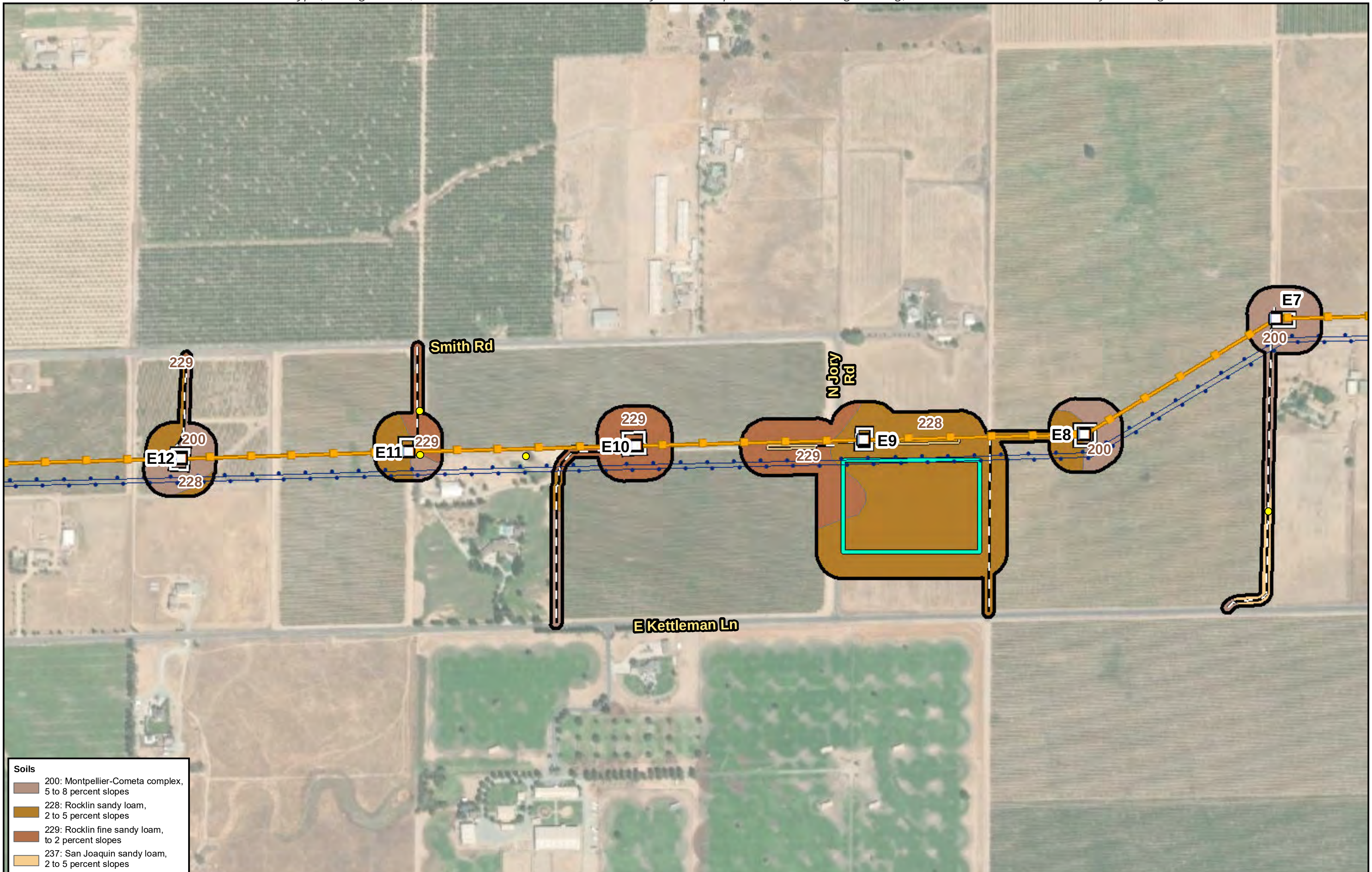

Legend

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- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
2

Source:
1) Esri World Imagery

N

0 200 Feet

Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 2 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_4_230818.mxd kgrant1 8/18/2023

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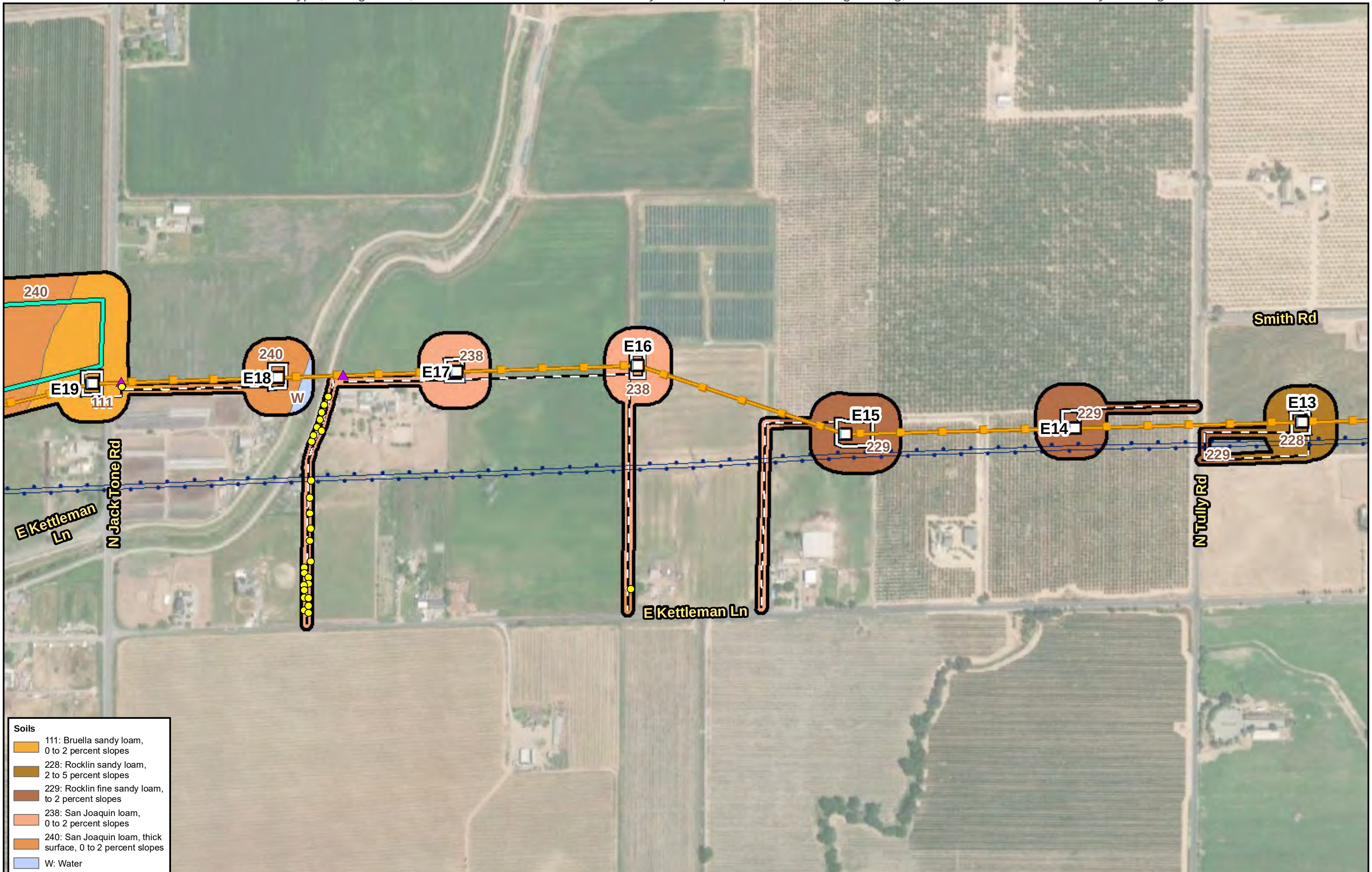

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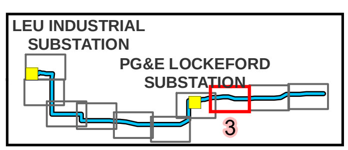

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 3 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_4_230818.mxd kgrant1 8/18/2023

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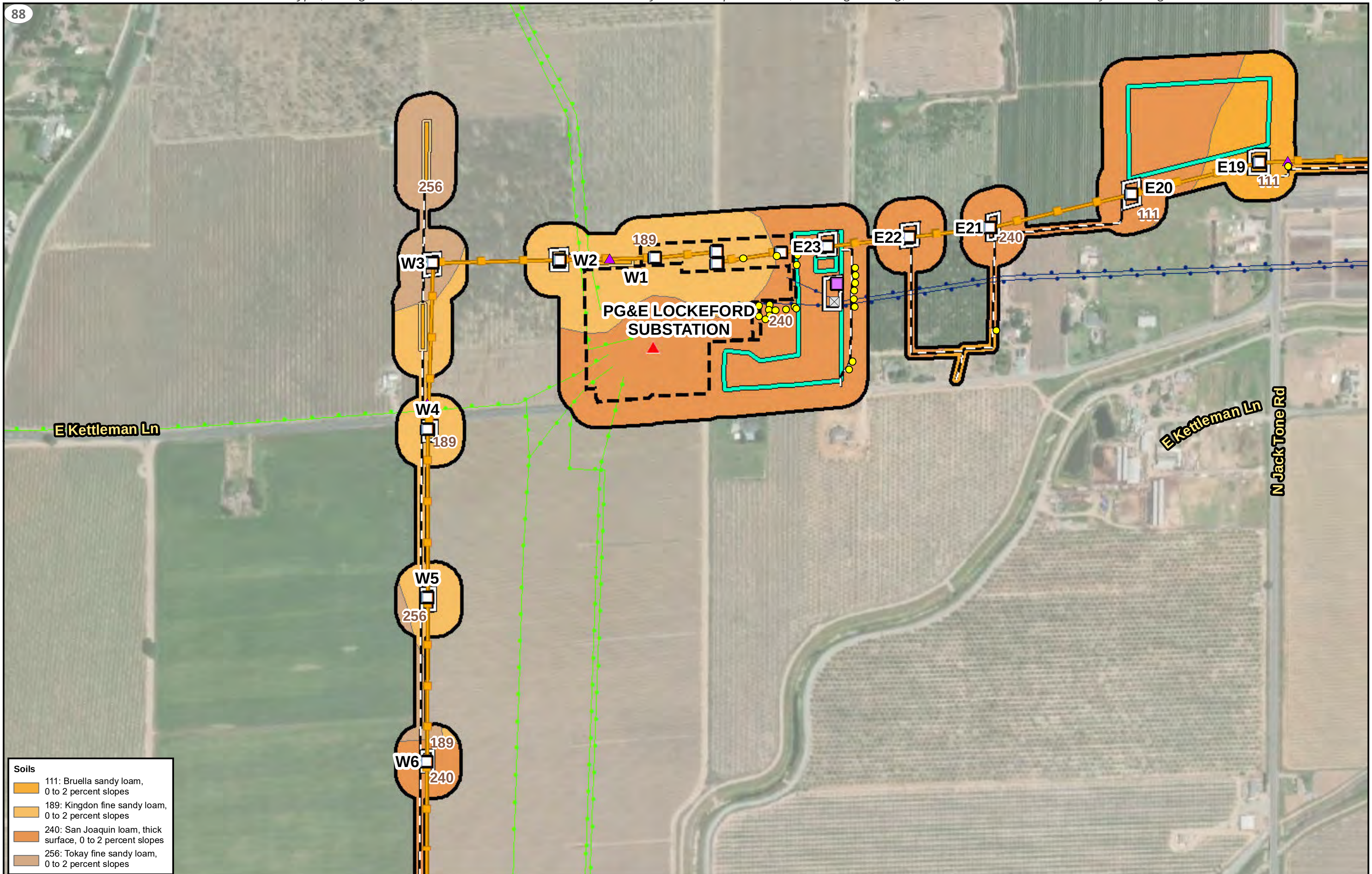

Legend

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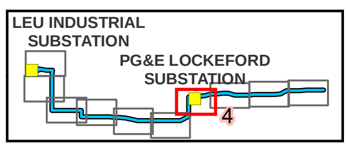

Source:
1) Esri World Imagery

0 200 Feet

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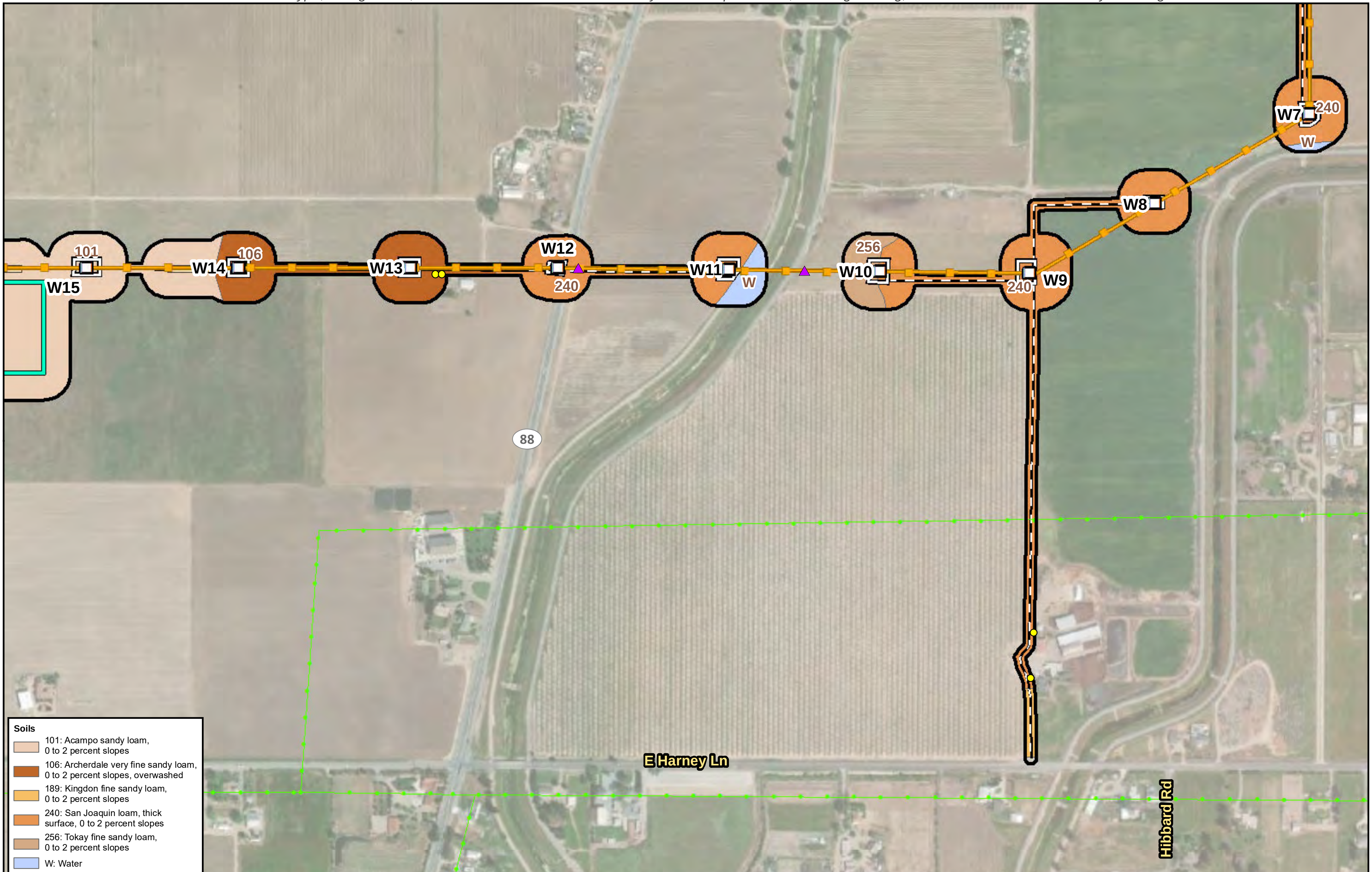
Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 4 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Rare_Plants\Figure_4_230818.mxd kgrant1 8/18/2023



Soils

101: Acampo sandy loam, 0 to 2 percent slopes

106: Archerdale very fine sandy loam, 0 to 2 percent slopes, overwashed

189: Kingdon fine sandy loam, 0 to 2 percent slopes

240: San Joaquin loam, thick surface, 0 to 2 percent slopes

256: Tokay fine sandy loam, 0 to 2 percent slopes

W: Water

Legend

Biological Study Area (387.06 acres)

Substation

PG&E New 230 kV Transmission Line

Existing 60 kV Power Line

Existing 230 kV Transmission Line

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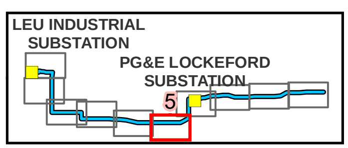

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4

NRCS Soil Series within the Biological Study Area

Page 5 of 10

Northern San Joaquin 230 kV Transmission Project

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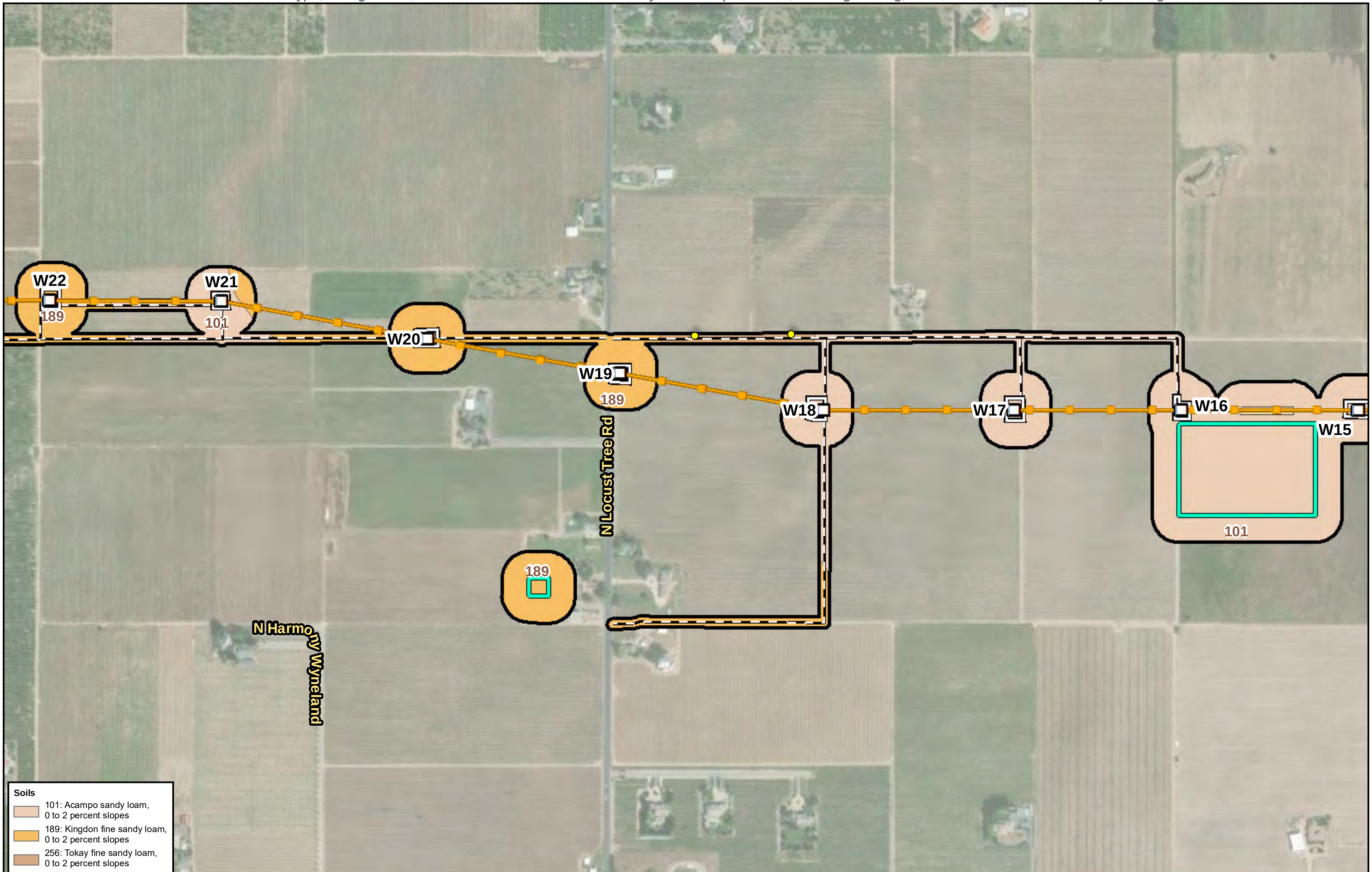

Legend

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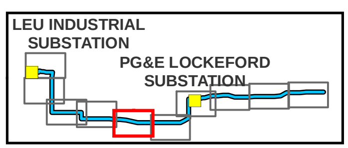

Source:
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Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 6 of 10
Northern San Joaquin 230 kV Transmission Project

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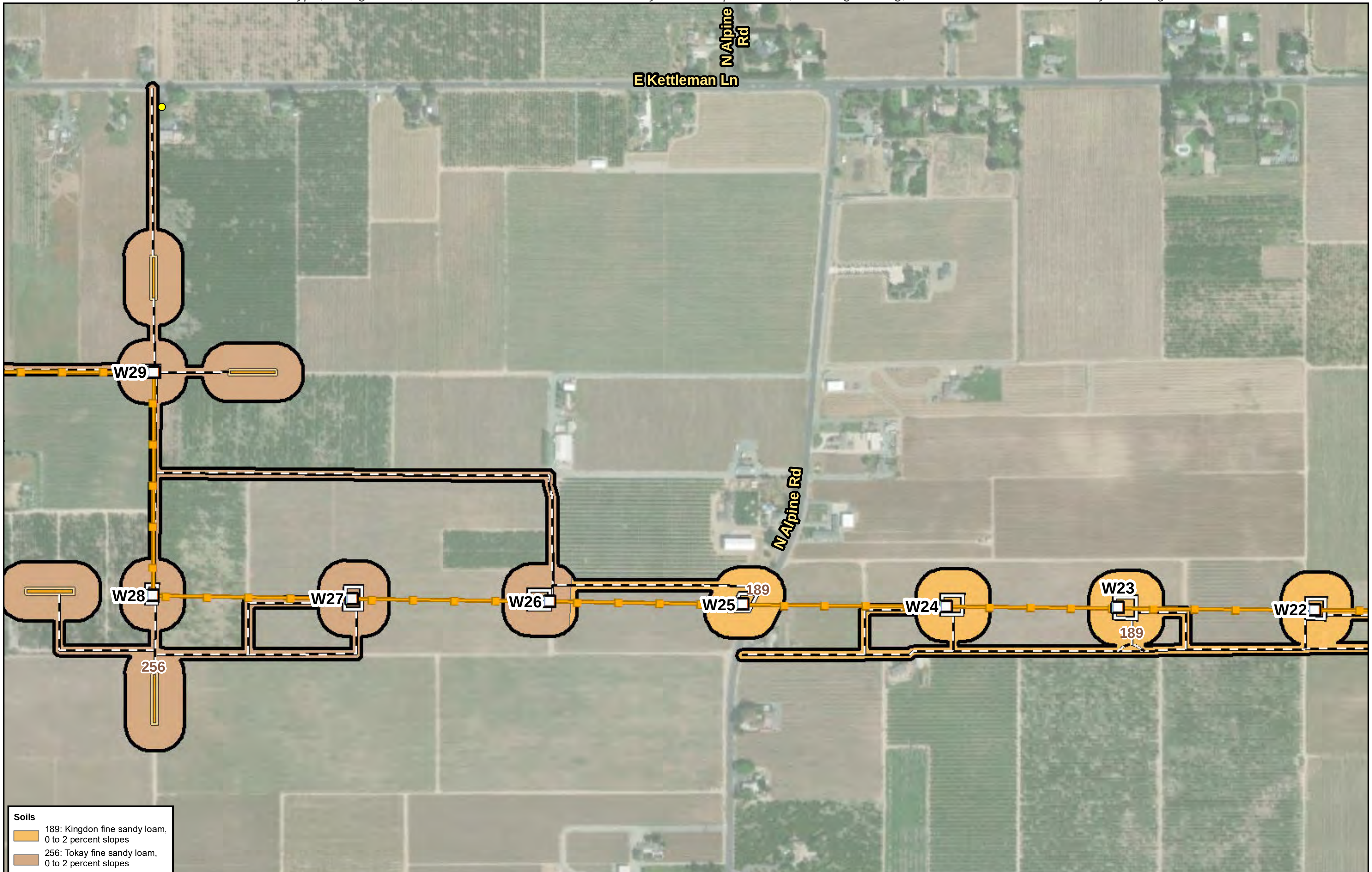

Legend

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Proposed Impact Areas

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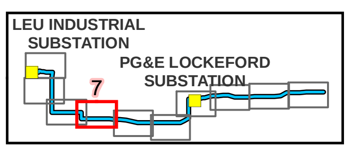

Source:
1) Esri World Imagery

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0 200 Feet

Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 7 of 10
Northern San Joaquin 230 kV Transmission Project

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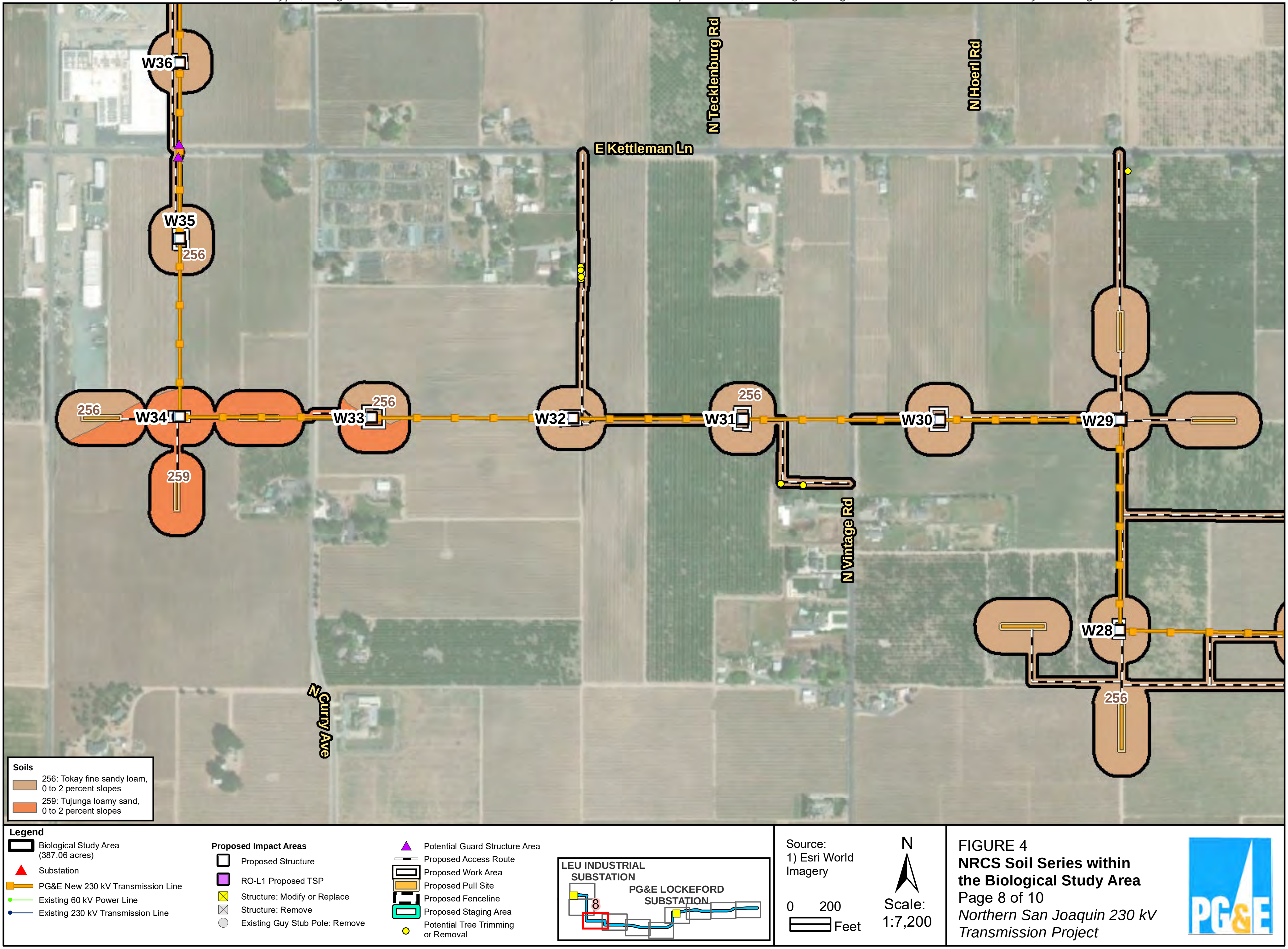

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 8 of 10
Northern San Joaquin 230 kV Transmission Project

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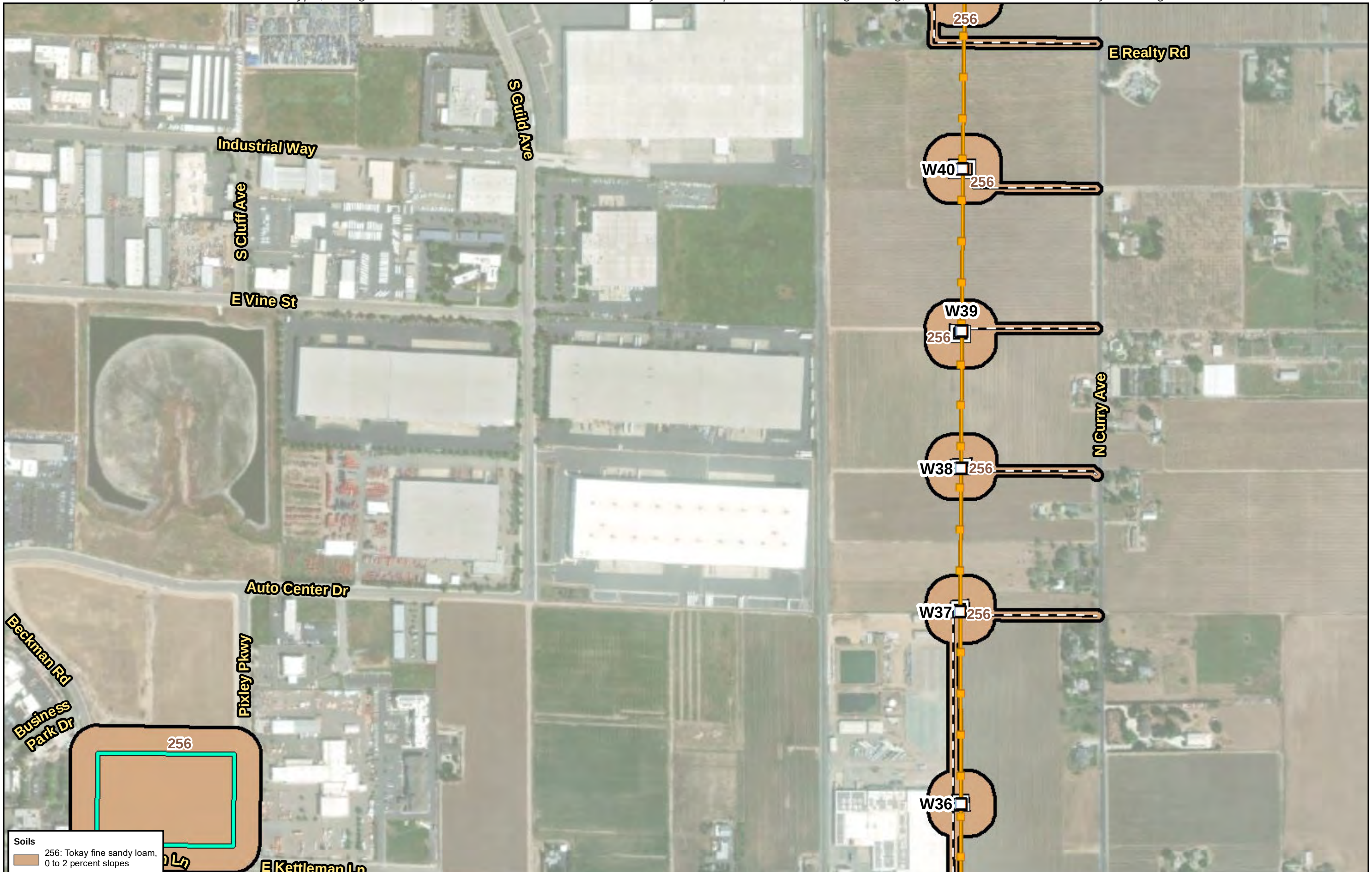

Legend

- Biological Study Area (387.06 acres)
- Substation
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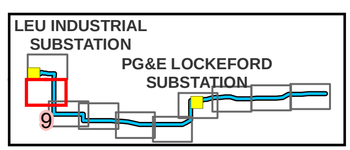

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4
NRCS Soil Series within the Biological Study Area
Page 9 of 10
Northern San Joaquin 230 kV Transmission Project

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Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

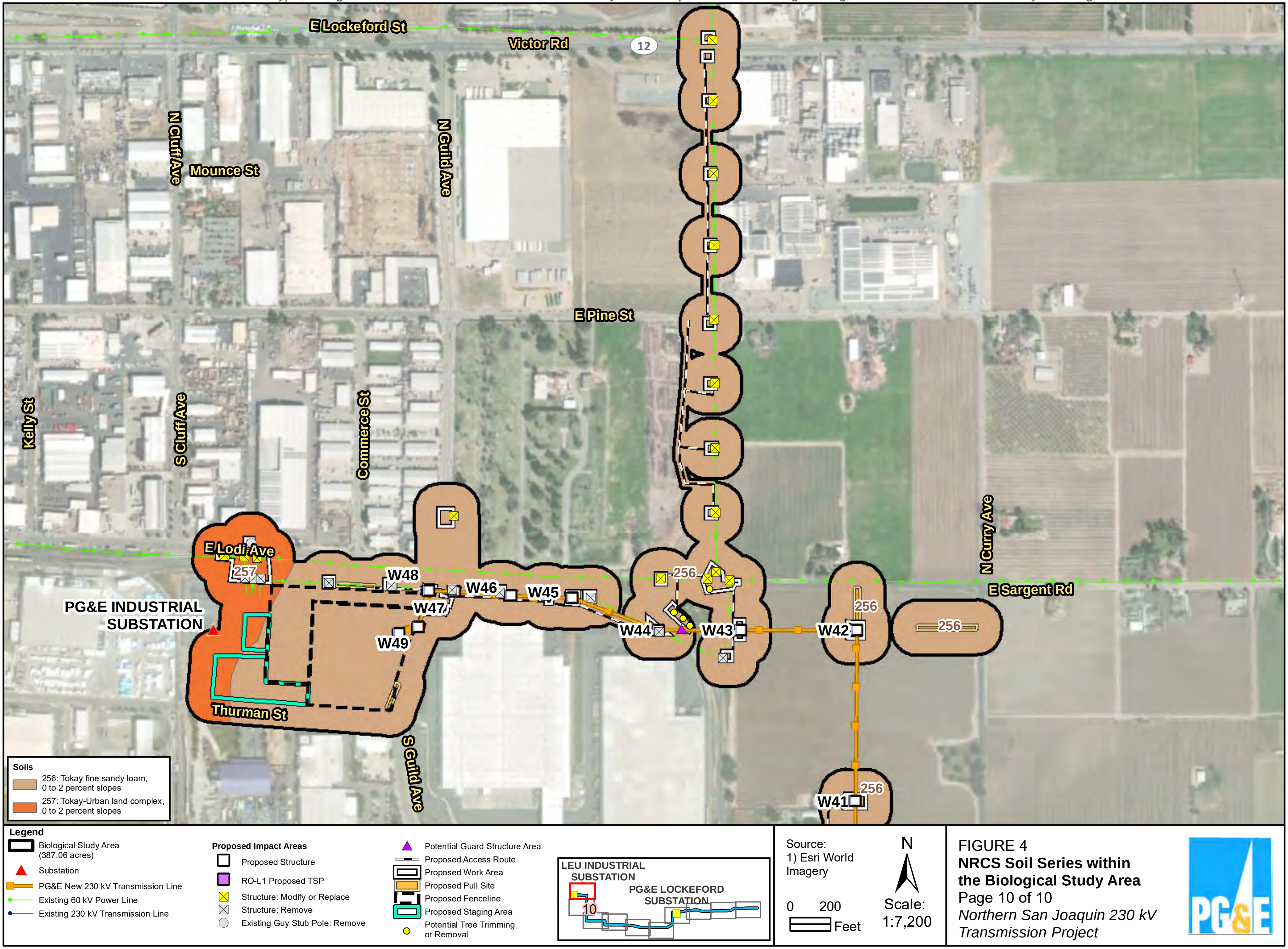

FIGURE 4
NRCS Soil Series within the Biological Study Area
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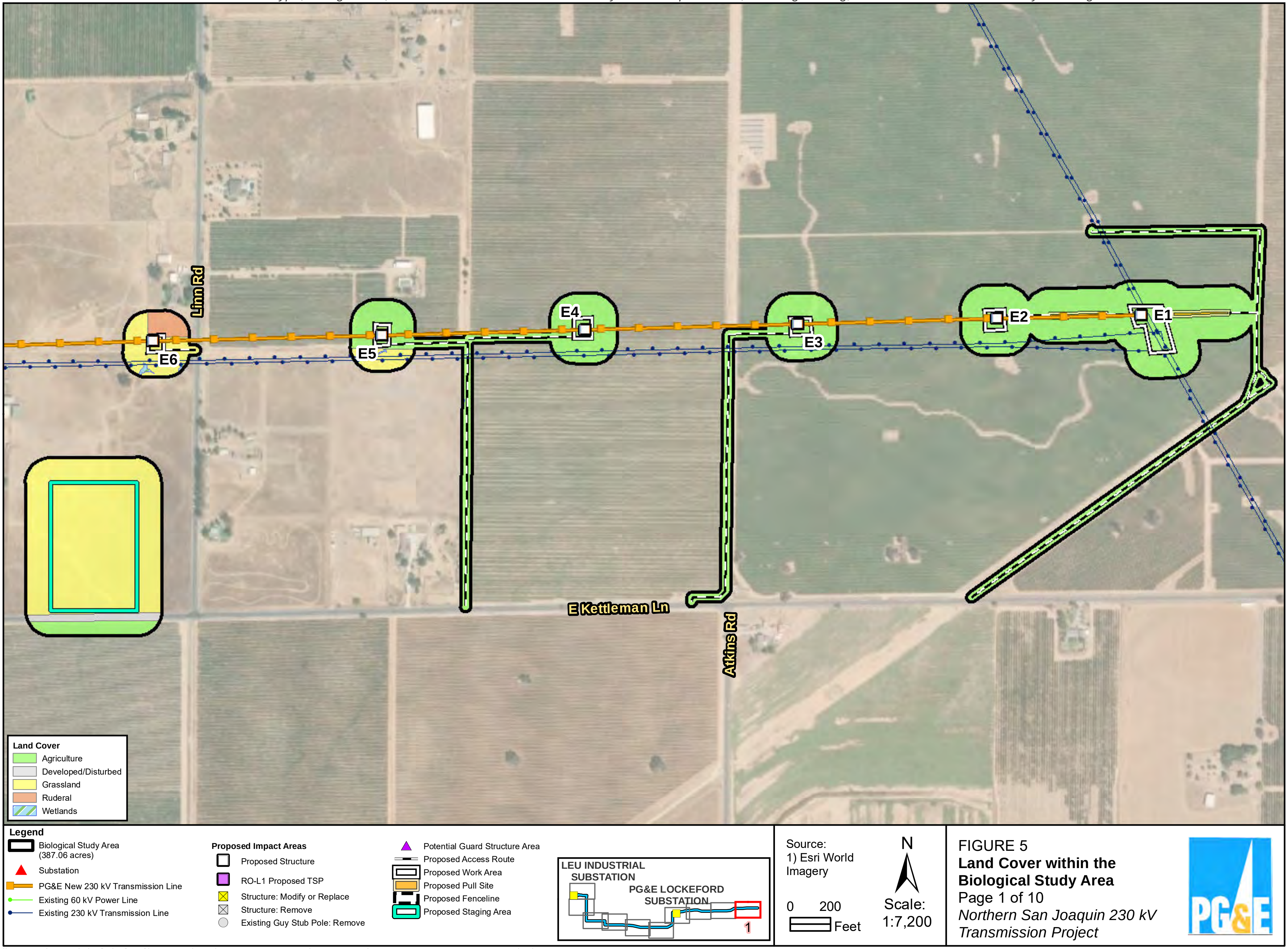

FIGURE 5
Land Cover within the Biological Study Area
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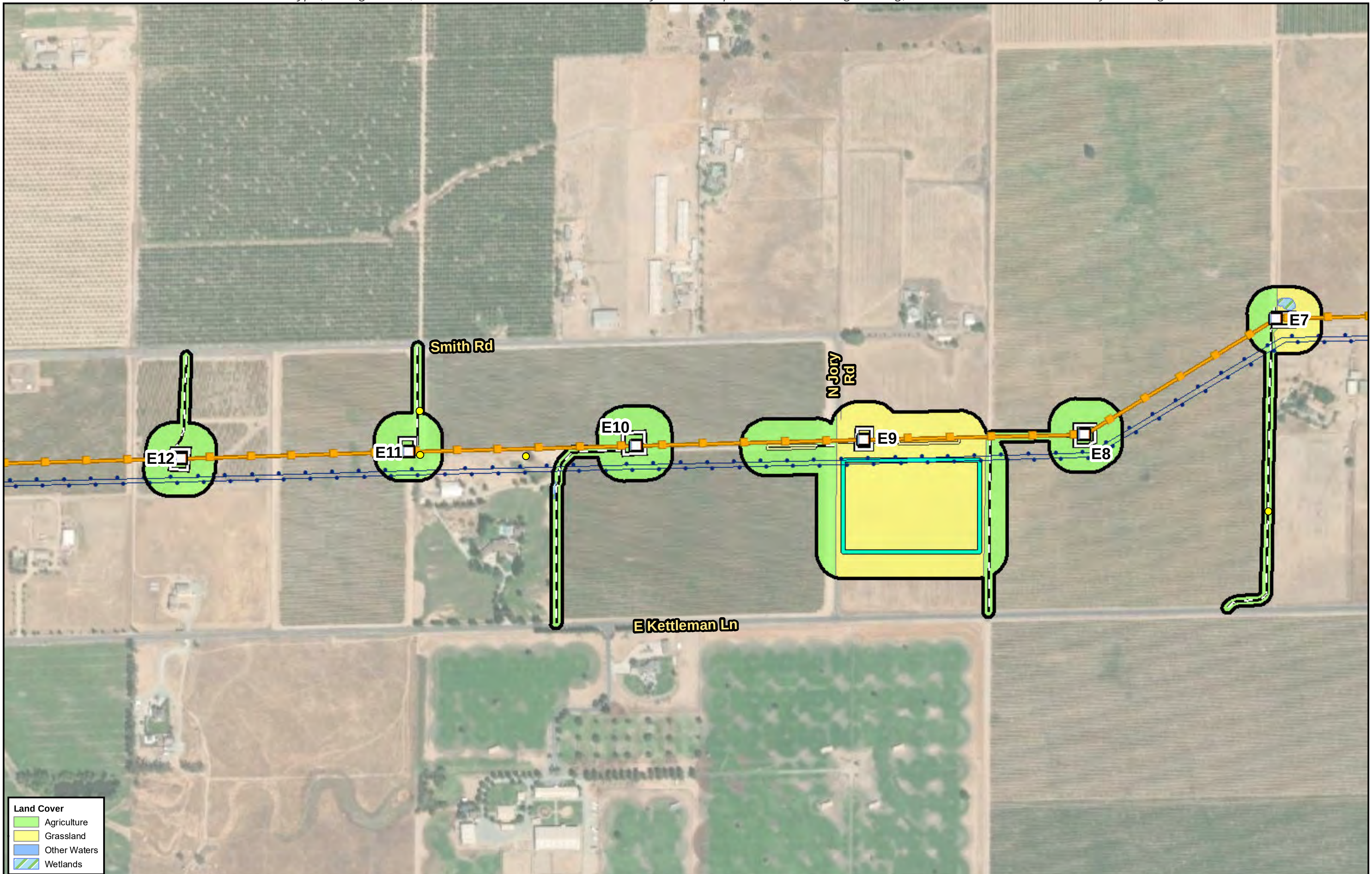

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

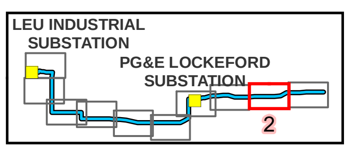

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FIGURE 5
Land Cover within the Biological Study Area
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Northern San Joaquin 230 kV Transmission Project

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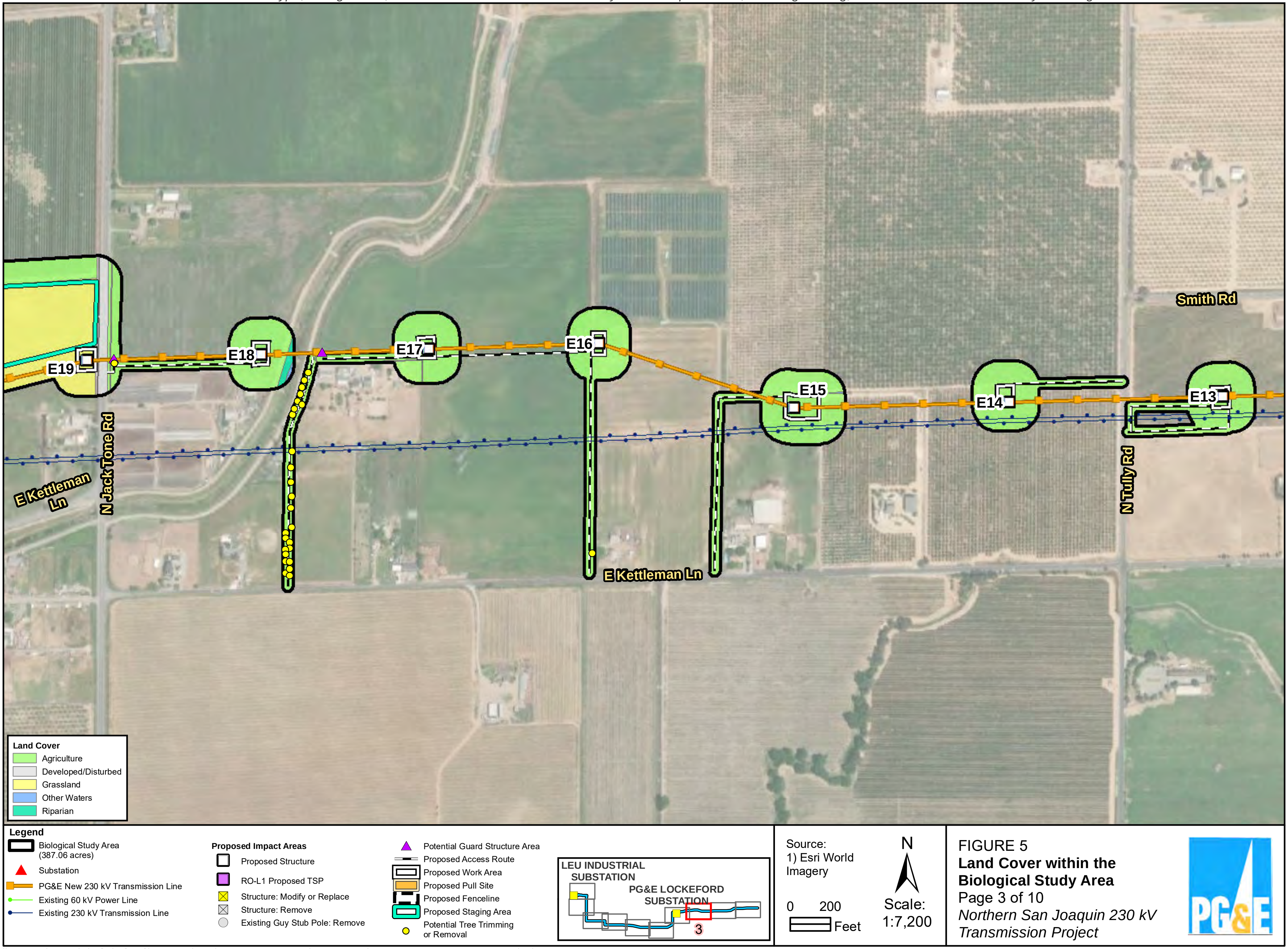

FIGURE 5
Land Cover within the Biological Study Area
Page 3 of 10
Northern San Joaquin 230 kV Transmission Project

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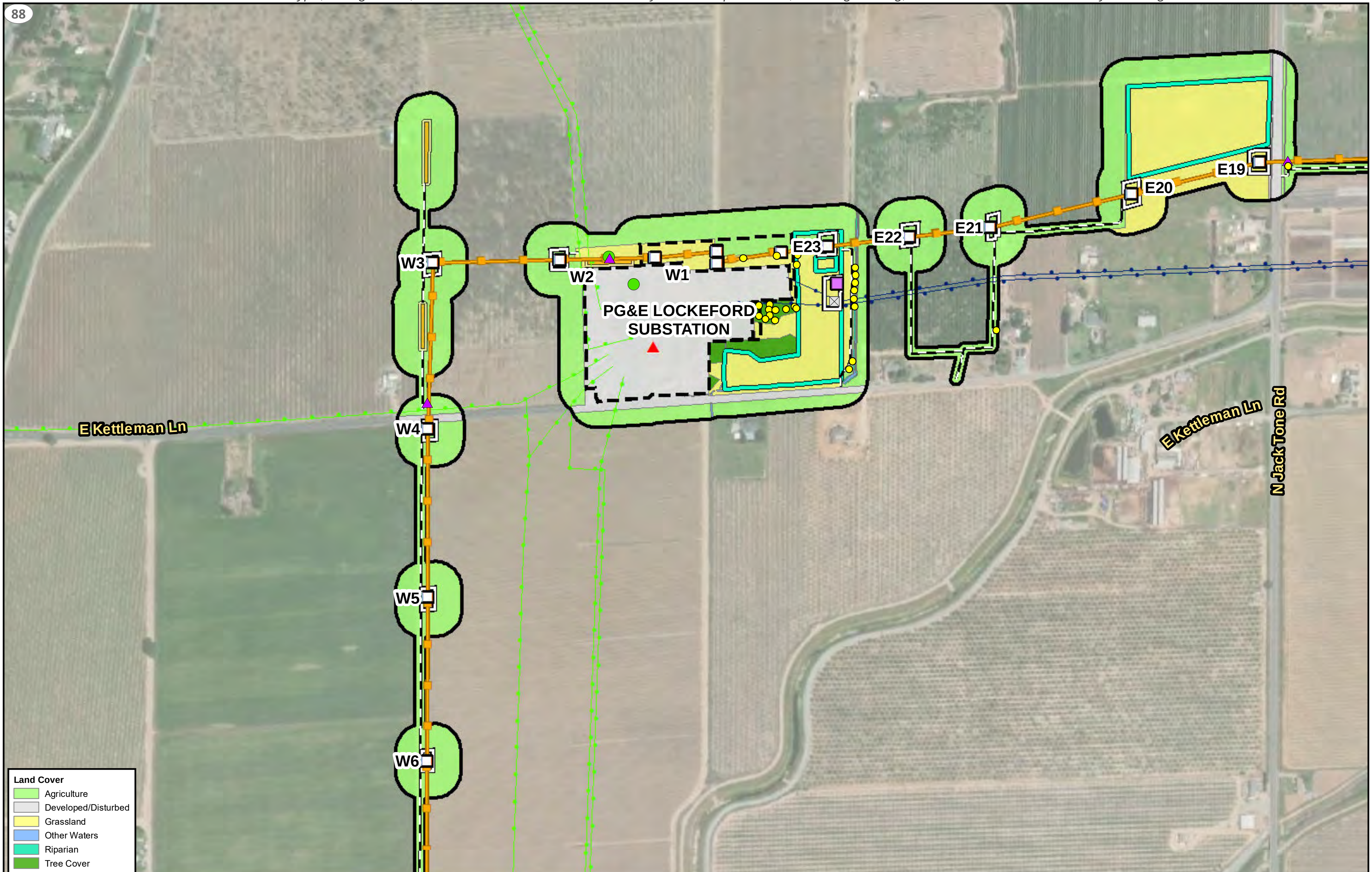

Legend

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- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal
- Elderberry Shrubs

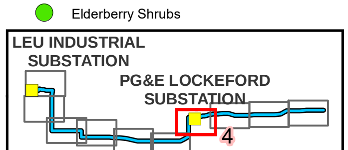

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FIGURE 5
Land Cover within the Biological Study Area
Page 4 of 10
Northern San Joaquin 230 kV Transmission Project

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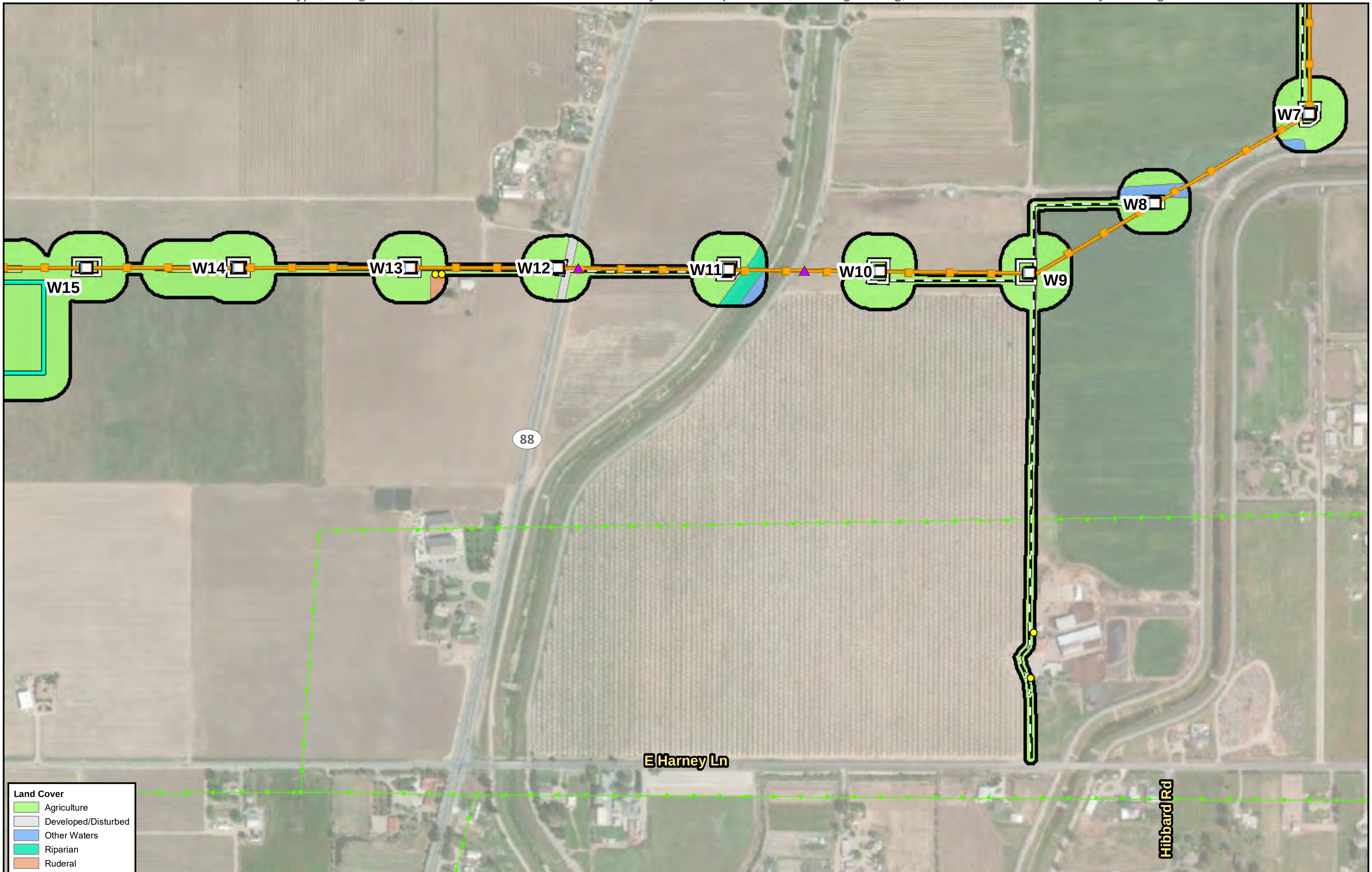

Legend

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Potential Tree Trimming or Removal

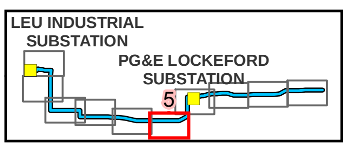

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FIGURE 5
Land Cover within the Biological Study Area
Page 5 of 10
Northern San Joaquin 230 kV Transmission Project

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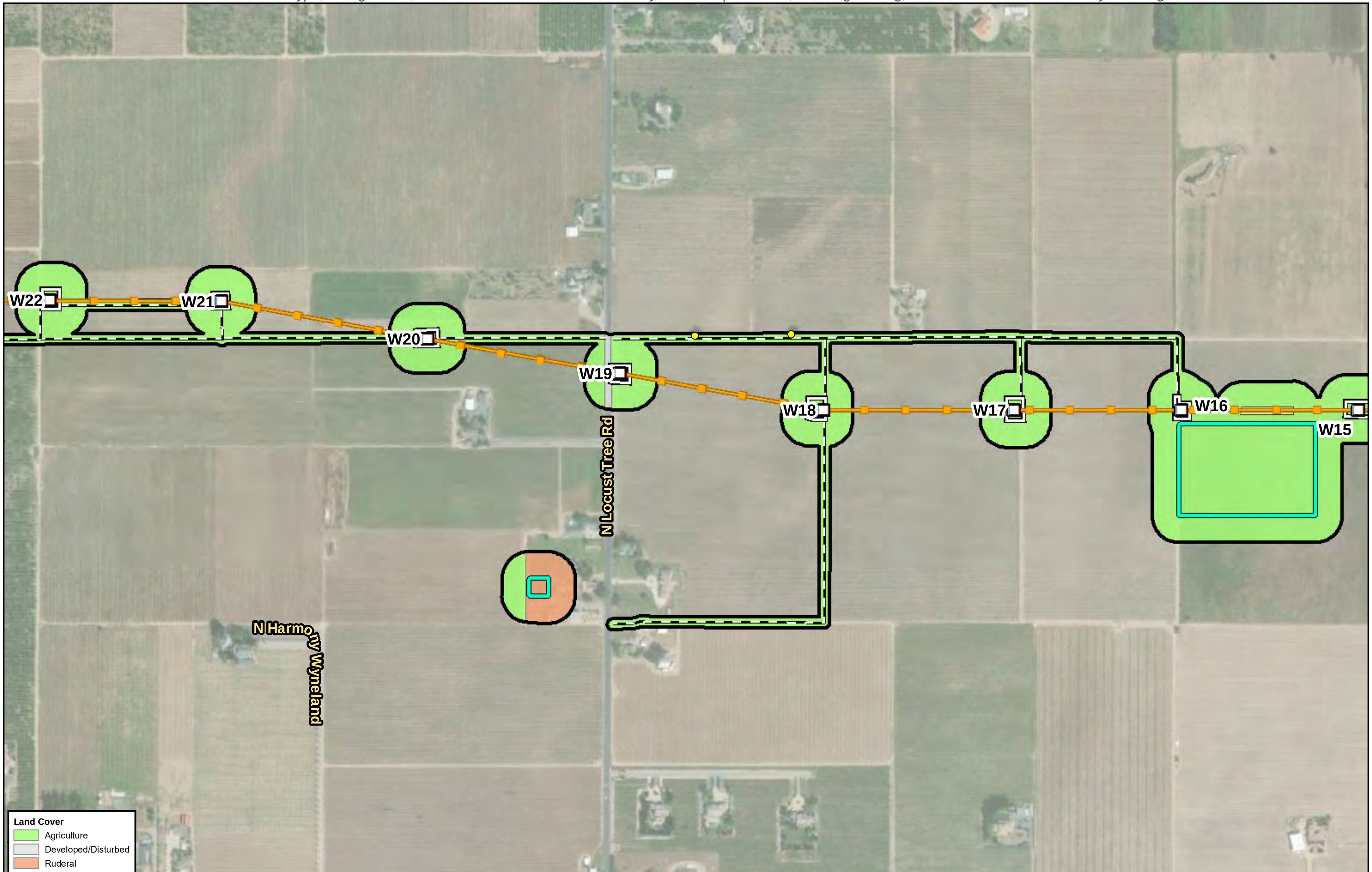

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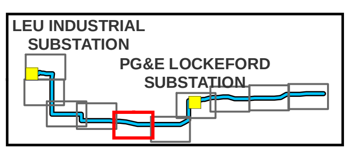

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FIGURE 5
Land Cover within the Biological Study Area
Page 6 of 10
Northern San Joaquin 230 kV Transmission Project

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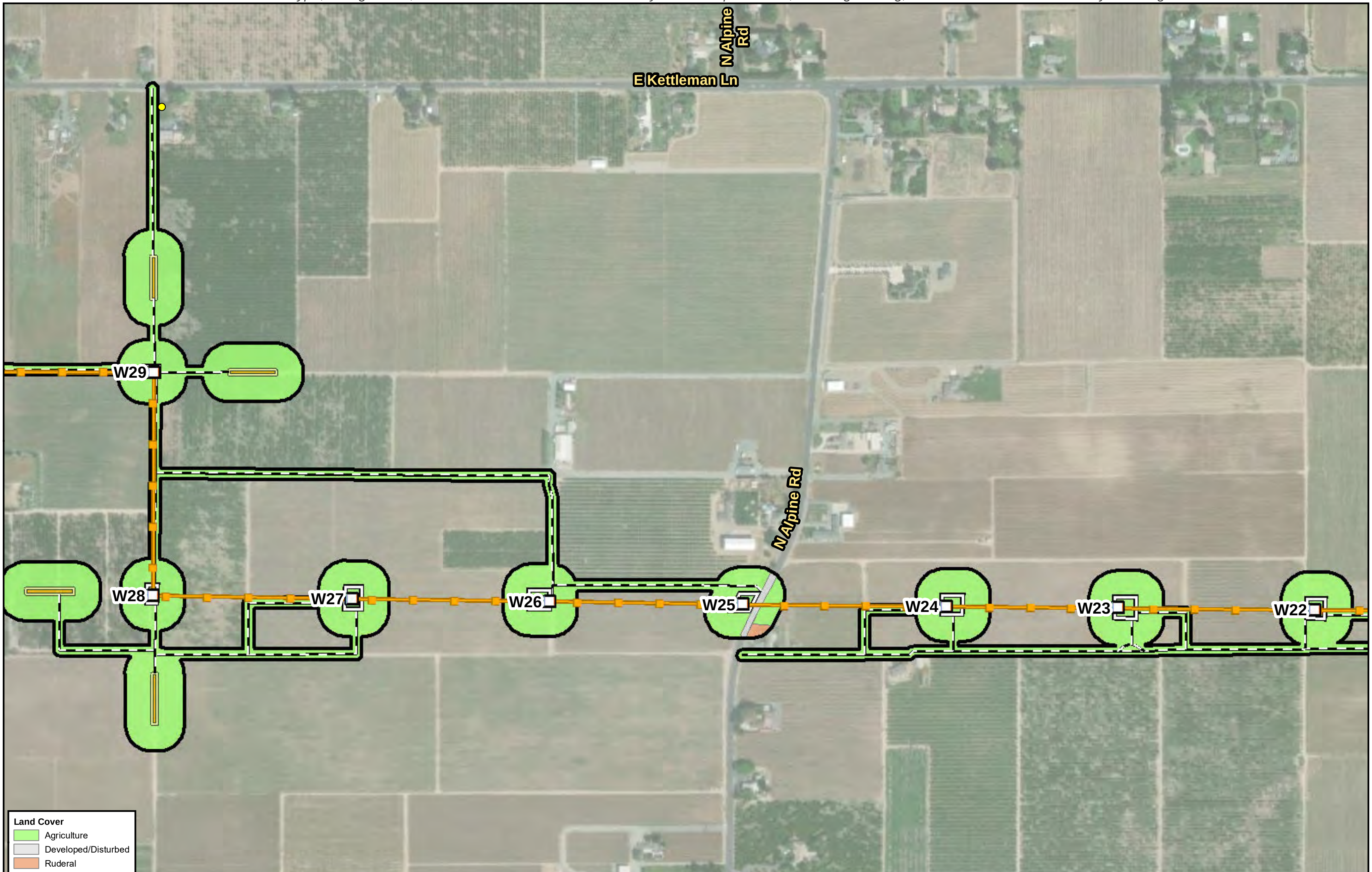

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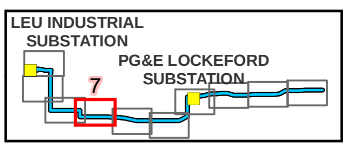

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FIGURE 5
Land Cover within the Biological Study Area
Page 7 of 10
Northern San Joaquin 230 kV Transmission Project

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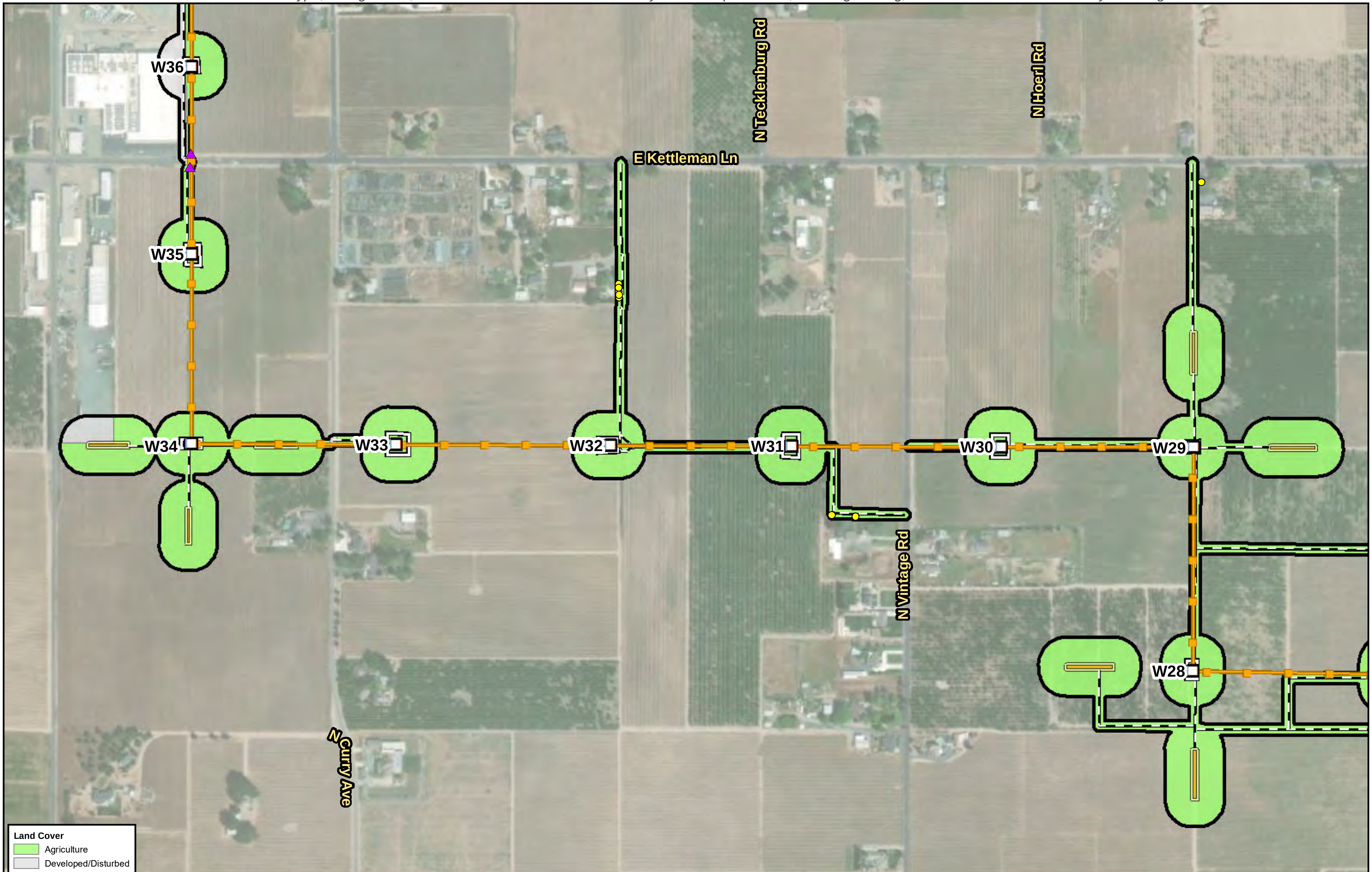

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FIGURE 5
Land Cover within the Biological Study Area
Page 8 of 10
Northern San Joaquin 230 kV Transmission Project

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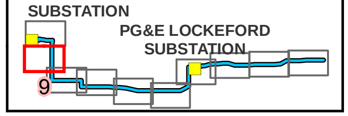

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FIGURE 5
Land Cover within the Biological Study Area
Page 9 of 10
Northern San Joaquin 230 kV Transmission Project

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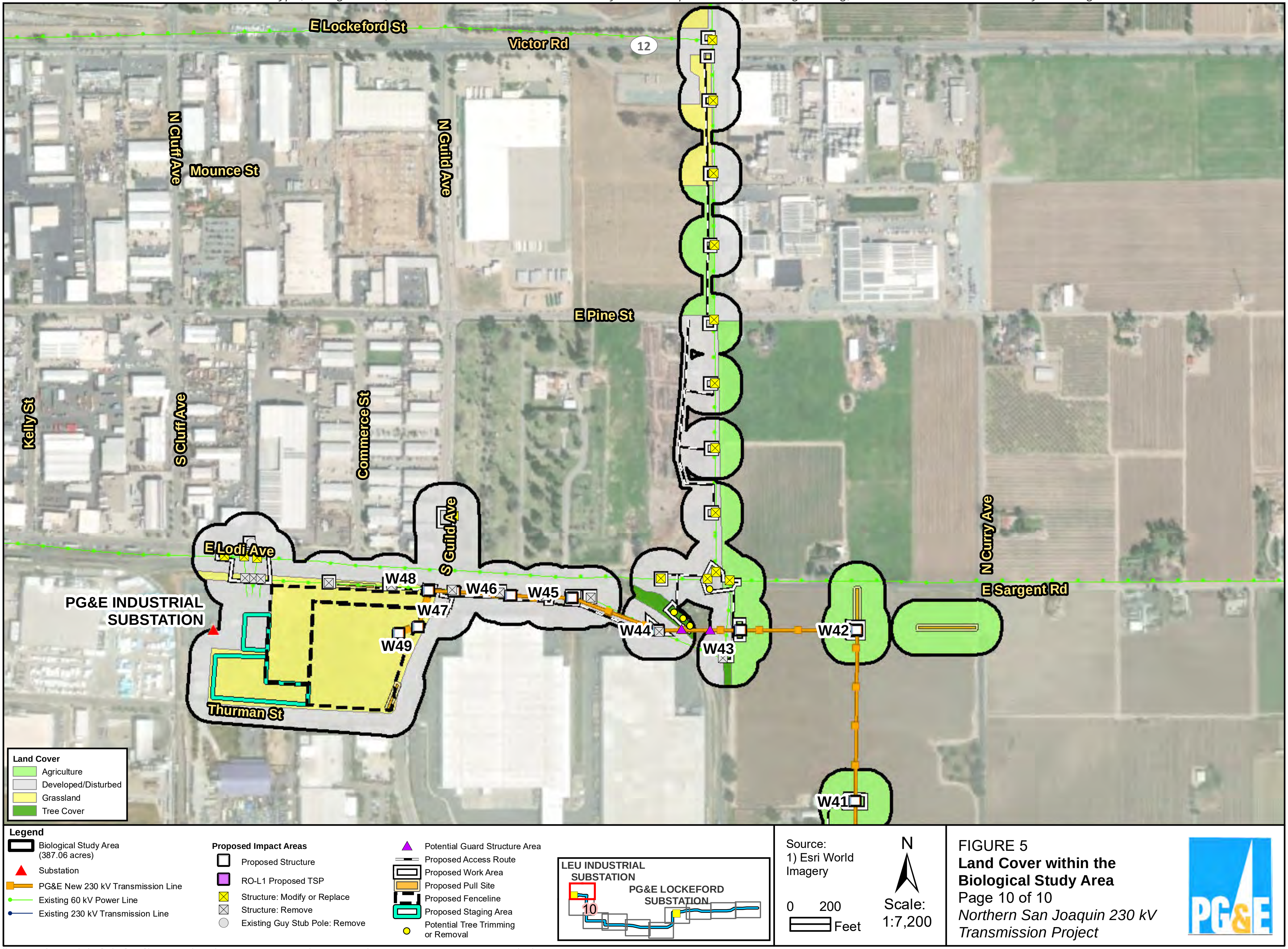

FIGURE 5
Land Cover within the Biological Study Area
Page 10 of 10
Northern San Joaquin 230 kV Transmission Project

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Appendix A
Special-Status Plants with the Potential to Occur in the Biological Study Area

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table A-1. Special-status Plant Species Identified in the Records Searches and their Potential to Occur in the Biological Study Area

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Agrostis hendersonii	Henderson's bent grass	-	-	3.2	Valley and foothill grassland (mesic) and vernal pools.	Apr-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Arctostaphylos myrtifolia	Ione manzanita	T	-	1B.2	Chaparral and cismontane woodland.	Nov-Mar	Absent. No suitable habitat is present within the BSA.
Astragalus tener var. *tener*	alkali milk vetch	-	-	1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands. In annual grassland or in playas or vernal pools.	Mar-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA, as do alkali flats. There is one historic occurrence in Stockton, but the BSA does not have alkali resources or vernal pools for this species to grow (Calflora 2022). This species was not observed during the seasonally appropriate botanical surveys.
Atriplex cordulata var. *cordulata*	heartscale	-	-	1B.2	Saline soils, Alkaline scrub, Chenopod scrub, meadows and seeps, valley and foothill grassland.	Apr-Oct	Unlikely to occur. Scrubs are not present in the BSA, and although there are historic occurrences in the Stockton West quadrangle (Calflora 2022), suitable habitat has predominantly been converted to agricultural development. Additionally, saline soils suitable for this species are not present in the BSA. This species was not observed during the seasonally appropriate botanical surveys.
Azolla microphylla	Mexican mosquito fern	-	-	4.2	Marshes and swamps (ponds, slow water).	Aug	Absent. Marshes and swamps are not present in the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Blepharizonia plumosa	big tarplant	-	-	1B.1	Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas.	Jul-Oct	Unlikely to occur. Calflora search results indicate a confirmed range within the BSA and one occurrence in the Stockton west quadrangle (Calflora 2022). However, suitable habitat such as slopes and burned areas are not present. Additionally, increasing agricultural development and urbanization has severely limited suitable habitat of this species. This species was not observed during the seasonally appropriate botanical surveys.
Brasenia schreberi	watershield	-	-	2B.3	Marshes and swamps (freshwater). This plant is strictly aquatic.	Jun-Sep	Absent. Marshes and swamps are not present in the BSA.
Brodiaea rosea	valley brodiaea	-	-	4.2	Old alluvial terraces; silty, sandy, and gravelly loam. Valley and foothill grassland (swales) and vernal pools.	Apr-May(Jun)	Unlikely to occur. Calflora search results indicate a confirmed range within the project site area and an occurrence in the Clements quadrangle (Calflora 2022). However, suitable habitat has predominantly been converted to vineyards and orchards, which do not support habitat requirements of this species. This species was not observed during the seasonally appropriate botanical surveys.
Calycadenia hooveri	Hoover's calycadenia	-	-	1B.3	Cismontane woodland and valley and foothill grassland.	Jul-Sep	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Carex comosa	bristly sedge	-	-	2B.1	Coastal prairie, marshes and swamps (lake margins), and valley and foothill grassland.	May-Sep	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Castilleja campestris var. *succulenta*	succulent owl's-clover	T	E	1B.2	Occurs usually in wetlands, occasionally in non-wetlands. Habitat is vernal pools (often acidic). Occurs in vernal pools with a variety of characteristics including small and large pools, bowl-shaped pools and swales, shallow and deep pools, and pools with short and long inundation periods. Vegetation communities include: valley grassland, foothill grassland, freshwater wetlands, wetland-riparian.	(Mar)Apr-May	Potential to occur. Although there are no CNDDB occurrences within 5 miles of the BSA, a reconnaissance survey conducted in early December of 2019 and an aquatic resources delineation conducted in April and May of 2021 indicated the presence of wetland features in portions of the BSA that could provide suitable habitat for this species. This species was not found during the appropriately timed botanical surveys.
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	-	-	4.2	Occurs in alkaline and vernally mesic soils in seeps, valley and foothill grassland, vernal pools, and sometimes roadsides.	May-Oct	Unlikely to occur. The BSA does not have alkali resources for this species to grow and there are no CNDDB occurrences within 5 miles of the BSA. This species was not observed during the seasonally appropriate botanical surveys.
Chloropyron palmatum	palmate-bracted bird's-beak	E	E	1B.1	Occurs in alkaline soils, grows in saline-alkaline soils in seasonally flooded lowland plains and basins at elevations of less than 500 feet. Associated plant species include iodine bush (*Allenrolfea occidentalis*), alkali heath (*Frankenia salina*), Great Valley gum plant (*Grindelia camporum*), and Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*). Vegetation communities include: chenopod scrub, valley grassland, foothill grassland.	May-Oct	Absent. No suitable habitat is present within the BSA.
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	-	-	2B.1	Marshes and swamps (brackish, coastal, freshwater).	Jul-Sep	Absent. No marshes or swamps are present within the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Delphinium recurvatum	recurved larkspur	-	-	1B.2	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbrush or valley chenopod scrub.	Mar-Jun	Absent. Calflora search results indicate a possible range within the BSA and an occurrence in the Stockton East quadrangle (Calflora 2022). However, no suitable habitat or a confirmed range overlap is present.
Downingia pusilla	dwarf downingia	-	-	2B.2	Occurs in wetlands. Habitat is vernal pools (no acidic preference) and wet ditches. Vegetation communities include: foothill woodland, valley grassland, freshwater wetlands, wetland-riparian.	Mar-May	Unlikely to occur. Calflora search results indicate a possible range within the project site area, an occurrence in the Stockton East quadrangle, and the possible occurrence of suitable habitat. However, there are no CNDDB occurrences within 5 miles of the BSA. This species was not observed during the seasonally appropriate botanical surveys.
Eryngium pinnatisectum	Tuolumne button-celery	-	-	1B.2	Cismontane woodland, lower montane coniferous forest, and vernal pools.	May-Aug	Absent. No suitable habitat is present within the BSA.
Eryngium racemosum	Delta button-celery	-	E	1B.1	Riparian scrub. Seasonally inundated floodplains on clay.	Jun-Oct	Absent. Riparian scrub and floodplains do not exist in the BSA.
Extriplex joaquinana	San Joaquin spearscale	-	-	1B.2	Alkaline soils, chenopod scrub. meadows and seeps, playas, valley and foothill grassland.	Apr-Oct	Unlikely to occur. There is only marginally suitable habitat present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Gratiola heterosepala	Boggs Lake hedge-hyssop	-	E	1B.2	Found predominately growing in clay soils, marshes and swamps (lake margins). Vernal pools.	Apr-Aug	Absent. Marshes and swamps do not occur in the BSA. Additionally, the closest extant populations of this species occur in Solano and Sacramento counties (Calflora 2022).
Hesperevax caulescens	hogwallow starfish	-	-	4.2	Valley and foothill grassland (mesic clay) and vernal pools (shallow)	Mar-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Hibiscus lasiocarpos var. *occidentalis*	wooly rose-mallow	-	-	1B.2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks and low peat islands in sloughs; can also occur on riprap and levees.	Jun-Sep	Absent. Marshes and swamps are not present in the BSA. Additionally, this species was not observed during the seasonally appropriate botanical surveys.
Horkelia parryi	Parry's horkelia	-	-	1B.2	Chaparral and cismontane woodland.	Apr-Sep	Absent. No suitable habitat is present within the BSA.
Juncus leiospermus var. *ahartii*	Ahart's dwarf rush	-	-	1B.2	Valley and foothill grassland (mesic).	Mar-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Lasthenia ferrisiae	Ferris' goldfields	-	-	4.2	Vernal pools (alkaline, clay).	Feb-May	Absent. No suitable habitat is present within the BSA.
Lathyrus jepsonii var. *jepsonii*	delta tule pea	-	-	1B.2	Found in freshwater and brackish marshes; most often in ditches and along levees near Napa. Often found with *Typha*, *Aster lentus*, *Rosa californica*, *Juncus* spp., *Scripus* spp., etc. Usually on marsh and slough edges.	May-Jul	Absent. The closest recorded observations of this species occur in western Lodi and Stockton (Calflora 2022); however, suitable habitat such as marshland sloughs are not present in the BSA.
Legenere limosa	legenere	-	-	1B.1	Occurs below elevations of 610 meters in vernal pools and wetlands. Vegetation communities include: valley grassland, freshwater wetlands, wetland-riparian.	Apr-Jun	Unlikely to occur. There is only marginally suitable seasonal wetland habitat present in the BSA. There are no CNDDDB occurrences within 5 miles of the BSA. This species was not observed during the seasonally appropriate botanical surveys.
Lilaeopsis masonii	Mason's lilaeopsis	-	R	1B.1	Found in freshwater and brackish marshes and in riparian scrub habitats; found along the margins of Napa River	Apr-Nov	Absent. This species grows predominantly along the margins of Napa River (Calflora 2022).
Limosella australis	Delta mudwort	-	-	2B.1	Marshes and swamps (brackish, freshwater) and riparian scrub.	May-Aug	Absent. No suitable habitat is present within the BSA.

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Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Navarretia myersii ssp. *myersii*	pincushion navarretia	-	-	1B.1	Vernal pools. Clay soils within non-native grassland.	Apr-May	Absent. This species predominantly occurs in the foothill grasslands of the Sierra Nevada (Calflora 2022).
Navarretia paradoxiclara	Patterson's navarretia	-	-	1B.3	Meadows and seeps.	May-Jun(Jul)	Absent. No suitable habitat is present within the BSA.
Orcuttia viscida	Sacramento Orcutt grass	E	E	1B.2	Occurs in wetlands. Habitat is vernal pools (often acidic). Vegetation communities include: valley grassland, freshwater wetlands, wetland-riparian.	Apr-Jul(Sep)	Absent. The closest extant populations occur in Placer, Sacramento, and El Dorado Counties outside of the BSA (Calflora 2022).
Ranunculus lobbii	Lobb's aquatic buttercup	-	-	4.2	Cismontane woodland, north Coast coniferous forest, valley and foothill grassland, and vernal pools.	Feb-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Sagittaria sanfordii	Sanford's arrowhead	-	-	1B.2	Occurs in wetlands, marshes and swamps (assorted shallow freshwater). Vegetation communities include freshwater wetlands, wetland-riparian.	May-Oct(Nov)	Potential to occur. Marginally suitable habitat is present in the BSA adjacent to aquatic resources such as creeks, canals, and ditches. There is one CNDDB occurrence within 5 miles of the BSA. This species was not found during appropriately timed botanical surveys.
Scutellaria galericulata	marsh skullcap	-	-	2B.2	Lower montane coniferous forest, meadows and seeps (mesic), and marshes and swamps.	Jun-Sep	Absent. No suitable habitat is present within the BSA.
Scutellaria lateriflora	side-flowering skullcap	-	-	2B.2	Meadows and seeps (mesic) and marshes and swamps.	Jul-Sep	Absent. No suitable habitat is present within the BSA.
Symphyotrichum lentum	Suisun marsh aster	-	-	1B.2	Found in brackish and freshwater marshes and swamps. Most often seen along sloughs with *Phragmites, Scripus, Rubus, Typha*, etc.	May-Nov	Unlikely to occur. Calflora search results indicate occurrences in the Stockton West, Stockton East, and Lodi South quadrangles (Calflora 2022). However, marshes and swamps are not present in the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Trifolium hydrophilum	saline clover	-	-	1B.2	Occurs in marshes and swamps, vernal pools and valley and foothill grassland. Mesic, alkaline sites.	Apr-Jun	Absent. Most recent observations of this species are within the Suisun and San Pablo bays (Calflora 2022). Suitable habitat is not considered present in the BSA.
Tuctoria greenei	Greene's Tuctoria	E	R	1B.1	Vernal pools.	May-Jul(Sep)	Absent. This species has recorded occurrences in Stockton and Farmington in 1936 (Calflora 2022). However, this species is considered extirpated from the BSA because of increased agricultural development and urbanization.

[a]STATUS CODES

Federal Designations:
E = Federally Endangered
T = Federally Threatened

State Designations:

E = State Endangered
R = State Rare

CNPS Rare Plant Rank:

1B = Rare, threatened, or endangered in California and elsewhere
2B = Rare, threatened, or endangered in California, but more common elsewhere
3 = More information is needed
4 = Limited distribution

Threat Rank:

- 0.1 Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
- 0.2 Fairly threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)
- 0.3 Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

Appendix B
List of Plant Species Observed in the Biological Study Area During Surveys

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table B-1. Plant Species Observed in the BSA During Surveys

Family	Scientific Name	Common Name	Native or Naturalized	Cal-IPC Rank
GYMNOSPERMS				
PINACEAE				
	Pinus radiata	Monterey pine	Native	
EUDICOTS				
ADOXACEAE				
	Sambucus nigra	black elderberry	Native	
APIACEAE				
	Foeniculum vulgare	fennel	Naturalized	Moderate
ALISMATACEAE				
	Sagittaria montevidensis	giant arrowhead	Native	
ARACEAE				
	Arum italicum	Italian lords and ladies	Naturalized	
	Lemna minor	smaller duckweed	Native	
	Wolffia sp.	duckweed	Native	
ASTERACEAE				
	Achyrachaena mollis	blow-wives	Native	
	Centaurea solstitialis	yellow star thistle	Naturalized	High
	Centromadia fitchii	spikeweed	Native	
	Cichorium intybus	chicory	Naturalized	
	Delairea odorata	cape ivy	Naturalized	High
	Erigeron bonariensis	flax-leaved horseweed	Naturalized	
	Erigeron canadensis	Canada horseweed	Native	
	Heterotheca grandiflora	telegraph weed	Native	
	Hypochaeris glabra	smooth cat's-ear	Naturalized	Limited
	Hypochaeris radicata	rough cat's-ear	Naturalized	Moderate
	Lactuca serriola	prickly lettuce	Naturalized	
	Leontodon saxatilis	hairy hawkbit	Naturalized	
	Logfia gallica	narrowleaf cottonrose	Naturalized	
	Matricaria discoidea	pineapple weed	Native	
	Pseudognaphalium luteoalbum	Jersey cudweed	Naturalized	
	Silybum marianum	milk thistle	Naturalized	Limited
	Sonchus asper	spiny snow thistle	Naturalized	
	Bignonia violacea	violet trumpet vine	Naturalized	
BORAGINACEAE				
	Amsinckia menziesii	fiddleneck	Native	
	Plagiobothrys canescens	valley popcornflower	Native	

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Family	Scientific Name	Common Name	Native or Naturalized	Cal-IPC Rank
BRASSICACEAE				
	Brassica nigra	black mustard	Naturalized	Moderate
	Capsella bursa-pastoris	Shepherd's purse	Naturalized	
	Lepidium nitidum	shining pepperweed	Native	
	Nasturtium officinale	watercress	Native	
	Raphanus sativus	radish	Naturalized	Limited
CAPRIFOLIACEAE				
	Lonicera japonica	Japanese honeysuckle	Naturalized	
CARYOPHYLLACEAE				
	Spergula arvensis	corn spurrey	Naturalized	
	Spergularia rubra	red sand-spurrey	Naturalized	
	Stellaria media	common chickweed	Naturalized	
CHENOPODIACEAE				
	Chenopodium album	Lamb's quarters	Naturalized	
	Salsola australis	Russian thistle	Naturalized	
CONVOLVULACEAE				
	Convolvulus arvensis	field bindweed	Naturalized	
EUPHORBIACEAE				
	Croton setiger	turkey-mullein	Native	
	Euphorbia maculata	spotted spurge	Naturalized	
FABACEAE				
	Acmispon americanus	American bird's foot trefoil	Native	
	Lupinus polyphyllus	bog lupine	Native	
	Medicago polymorpha	California burclover	Naturalized	Limited
	Trifolium dubium	little hop clover	Naturalized	
	Trifolium hirtum	rose clover	Naturalized	Limited
	Trifolium repens	white clover	Naturalized	
	Vicia villosa	hairy vetch	Naturalized	
FAGACEAE				
	Quercus engelmannii	Engelmann oak	Native	
	Quercus lobata	valley oak	Native	
GERANIACEAE				
	Erodium botrys	broadleaf filaree	Naturalized	
	Erodium moschatum	Musky stork's bill	Naturalized	
	Geranium dissectum	cutleaf geranium	Naturalized	Limited
JUGLANDACEAE				
	Juglans nigra	black walnut	Naturalized	

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Family	Scientific Name	Common Name	Native or Naturalized	Cal-IPC Rank
LAMIACEAE				
	Mentha pulegium	pennyroyal	Naturalized	Moderate
	Trichostema lanceolatum	vinegarweed	Native	
LYTHRACEAE				
	Lythrum hyssopifolia	hyssop loosestrife	Naturalized	Moderate
MALVACEAE				
	Malva parviflora	Cheeseweed mallow	Naturalized	
MONTIACEAE				
	Calandrinia menziesii	red maids	Native	
	Claytonia parviflora	miner's lettuce	Native	
MORACEAE				
	Morus alba	mulberry	Naturalized	
MYRSINACEAE				
	Lysimachia arvensis	scarlet pimpernel	Naturalized	
MYRTACEAE				
	Eucalyptus globulus	blue gum	Naturalized	Limited
OLEACEAE				
	Ligustrum japonicum	Japanese privet	Naturalized	
	Olea europaea	olive	Naturalized	Limited
ONAGRACEAE				
	Epilobium brachycarpum	annual fireweed	Native	
PHRYMACEAE				
	Erythranthe guttata	common monkeyflower	Native	
PLANTAGINACEAE				
	Plantago lanceolata	English plantain	Naturalized	Limited
POLYGONACEAE				
	Polygonum aviculare	knotweed	Naturalized	
	Rumex crispus	curly dock	Naturalized	Limited
PORTULACACEAE				
	Portulaca oleracea	common purslane	Naturalized	
RANUNCULACEAE				
	Ranunculus sceleratus	cursed crowfoot	Native	
ROSACEAE				
	Malus floribunda	Japanese flowering crabapple	Naturalized	
	Prunus avium	sweet cherry	Naturalized	
	Rosa californica	California rose	Native	
	Rubus armeniacus	Himalayan blackberry	Naturalized	High

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Family	Scientific Name	Common Name	Native or Naturalized	Cal-IPC Rank
RUBIACEAE				
	Galium aparine	common bedstraw	Native	
RUTACEAE				
	Geijera parviflora	wilga	Naturalized	
SALICACEAE				
	Salix babylonica	weeping willow	Naturalized	
	Salix lasiolepis	arroyo willow	Native	
	Populus fremontii	cottonwood	Native	
SCROPHULARIACEAE				
	Buddleja davidii	butterfly bush	Naturalized	Watch
SIMAROUBACEAE				
	Ailanthus altissima	tree of heaven	Naturalized	Moderate
VERBENACEAE				
	Verbena hastata	swamp verbena	Native	
ZYGOPHYLLACEAE				
	Tribulus terrestris	puncture vine	Naturalized	Limited
MONOCOTS				
CYPERACEAE				
	Cyperus eragrostis	nutsedge	Native	
	Eleocharis macrostachya	common spikerush	Native	
	Scirpus sp.	bulrush	Native	
JUNCACEAE				
	Juncus bufonius	toad rush	Native	
	Juncus xiphioides	Iris leaved rush	Native	
POACEAE				
	Arundo donax	giant reed	Naturalized	High
	Avena barbata	slender wild oat	Naturalized	
	Avena fatua	Wild oat	Naturalized	Moderate
	Briza minor	small quaking grass	Naturalized	
	Bromus diandrus	ripgut brome	Naturalized	Moderate
	Bromus hordeaceus	soft chess	Naturalized	Limited
	Bromus madritensis	foxtail chess	Naturalized	
	Bromus tectorum	cheatgrass	Naturalized	High
	Eleusine indica	goose grass	Naturalized	
	Elymus caput-medusae	Medusa head	Naturalized	High
	Festuca bromoides	brome fescue	Naturalized	
	Festuca myuros	rat-tail fescue	Naturalized	Moderate
	Festuca perennis	rye grass	Naturalized	Moderate
	Hordeum murinum	foxtail barley	Naturalized	Moderate

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Family	Scientific Name	Common Name	Native or Naturalized	Cal-IPC Rank
	Hordeum murinum subsp. leporinum	hare barley	Naturalized	Moderate
	Phalaris lemmonii	Lemmon's canarygrass	Native	
	Poa annua	annual blue grass	Naturalized	
	Poa secunda	pine bluegrass	Native	
	Polypogon monspeliensis	rabbitsfoot grass	Naturalized	Limited
	Sorghum halepense	Johnsongrass	Naturalized	
	Triticum aestivum	common wheat	Naturalized	
THEMIDACEAE				
	Triteleia hyacinthina	white brodiaea	Native	
	Triteleia laxa	Ithuriel's spear	Native	
TYPHACEAE				
	Typha latifolia	broadleaf cattail	Native	

Notes:

* Special-status plant species

California Invasive Plant Council (Cal-IPC) Ranks:

High – These species have severe ecological impacts on physical processes. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent, but generally not severe, ecological impacts. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future.

Appendix C
Representative Site Photographs

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Photo 1. Representative photo of developed agricultural land cover in this photo depicting a vineyard underneath existing PG&E transmission lines, within the BSA, facing east; April 27, 2021.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Photo 2. *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance vegetation within a culverted ditch adjacent to access road within the BSA, facing north; April 27, 2021.

Photo 3. Representative photograph of ruderal vegetation that is common along the margins of hardscape within the BSA. Vegetation of *Bromus* (*diandrus, hordeaceus*) – *Brachypodium distachyon* herbaceous semi-natural Alliance and *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance can be observed in the background behind the fence. Facing southwest; May 11, 2021.

Photo 4. Bear Creek where it passes through the BSA, depicting a mixture of *Schoenoplectus* (*acutus, californicus*) Herbaceous Alliance (hardstem and California bulrush marshes), *Juncus* (*oxymeris, xiphioides*) Provisional Herbaceous Alliance (Iris-leaf rush seeps) vegetation facing northeast; April 28, 2021.

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Photo 5. Representative photograph of vegetation within the *Lolium perenne* (*Festuca perennis*) Herbaceous Semi-Natural Alliance (perennial rye grass fields) with seaside barley (*Hordeum marinum*), foxtail barley (*Hordeum murinum*), soft chess (*Bromus hordeaceus*), and *Festuca* ssp. depicted here within the BSA, facing south; April 28, 2021.

Photo 6. Representative photograph depicting a potential location for the special-status species Sanford's arrowhead (*Sagittaria sanfordii*) in the BSA. This location is on the eastern side of the existing PG&E Lockeford Substation within a drainage. No special-status species were found within the BSA during surveys. Facing south; April 28, 2021.

Appendix C2
Northern San Joaquin 230 kV Transmission Project Aquatic Resources Delineation Report

Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California

Aquatic Resources Delineation Report

Final

May 2023

Pacific Gas and Electric Company

Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California

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Acronyms and Abbreviations

°F	degrees Fahrenheit
APT	Antecedent Precipitation Tool
BSA	biological study area
CW	constructed watercourse
DD	drainage ditch
HUC	Hydrologic Unit Code
kV	kilovolt
LEU	Lodi Electric Utility
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NW	natural watercourse
NWI	National Wetland Inventory
OHWM	ordinary high water mark
PG&E	Pacific Gas and Electric Company
project	Northern San Joaquin 230 kV Transmission Project
SP	sample point
SR	State Route
SW	seasonal wetland
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service

1. Introduction

Pacific Gas and Electric Company (PG&E) proposes the Northern San Joaquin 230 kilovolt (kV) Transmission Project (project) to provide a new 230 kV transmission system in northern San Joaquin County in central California. The purpose of the project is to increase electric reliability and accommodate forecasted load growth to electrical customers in northern San Joaquin County. The project includes activities by PG&E and the City of Lodi's Electric Utility (Lodi Electrical Utility or LEU). This project description summary includes PG&E's portion of the project and LEU's portion of the project. This report references PG&E's portion of the project or LEU's portion of the project in select sections. Refer to PG&E's project Proponent's Environmental Assessment for potential impact discussion by utility.

This report presents the results of an aquatic resource delineation that was completed for the project in 2021 and was prepared following the *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports and Updated Map and Drawing Standards* for the South Pacific Division Regulatory Program, prepared by the U.S. Army Corps of Engineers (USACE), Sacramento District (USACE 2016a, 2016b). Results and conclusions presented in this report are considered preliminary, pending verification by the Sacramento USACE Regulatory Branch. The project overview, location, environmental setting, and survey methods and results are provided in the following sections.

1.1 Project Overview

The project proposes to loop PG&E's existing overhead Brighton-Bellota 230 kV transmission line through PG&E Lockeford Substation and installing a new overhead double-circuit 230 kV transmission line between PG&E Lockeford Substation and a new switching station (PG&E Thurman Switching Station) at Lodi Electric Utility (LEU) Fred M. Reid Industrial Substation (LEU Industrial Substation) in Lodi, California. LEU will construct LEU Guild Substation, a new 230/60 kV substation, between LEU Industrial Substation and the new PG&E Thurman Switching Station. At LEU Guild Substation, the new 230 kV transmission line will terminate, and transformers will step down the power to 60 kV and connect with LEU Industrial Substation. When the new 230 kV system is operating, the existing local PG&E 60 kV system will be reconfigured, including disconnecting from LEU's 60 kV system at LEU Industrial Substation. The PG&E 60 kV lines will be removed or reconfigured within their existing alignments.

PG&E will perform project-related work at four remote-end substations (Brighton, Bellota, Rio Oso, and Lodi), which are located in Folsom, Linden, Rio Oso, and Lodi, respectively, to update the system protection scheme.

The proposed project includes new or modified aboveground substations; switching station; microwave towers; Federal Communications Commission towers; and transmission, power, distribution/feeder, and telecommunication (optical ground and shield wires) lines. Belowground facilities or portions thereof include new and modified foundations, grounding grids, extended and relocated 12 kV lines, and telecommunication circuits at stations. Project activities will occur within new and existing right-of-way, along new proposed and existing access roads, and on PG&E property and City of Lodi property. Construction work areas and access roads will occur within existing, modified, or new rights-of-way, with some adjacent or nearby temporary construction work areas and access.

1.2 Project Location

The proposed project is within unincorporated areas of northeastern San Joaquin County, and partially within an industrial area of the City of Lodi (Figure 1 at the end of this report). Within the City of Lodi, the general plan land use designation and zoning is industrial with industrial and commercial business and associated railroad lines on adjacent parcels. Major geographic features in the project area include the Mokelumne River, Bear Creek, State Route (SR) 99, SR 88, and SR 12.

A biological study area (BSA) for the project was established as a 250-foot-wide buffer around the proposed power line and all potential work areas (including new proposed structure locations, staging areas, and new proposed substations) and a 50-foot-wide buffer around proposed access roads (Figure 2). The BSA encompasses approximately 387 acres.

1.3 Site Restoration

The majority of the project area is located in developed and agricultural areas that are either paved or disturbed and free of vegetation, have urban landscaping, or are croplands. Work areas, whether vegetated or not, will be restored to preconstruction conditions, except where agriculture will not be replaced to support safe operation of the new 230 kV transmission lines. Vegetated areas disturbed by the project may include limited street or landscaped areas that would be replanted per agreement with the landowner.

At the excavation locations for new structures, excavated subsoil will be kept onsite and used as backfill if suitable to be used as such. Any remaining excavated soils will be managed appropriately, off hauled, and disposed of at an appropriate offsite location.

As part of the final construction activities, PG&E will restore all disturbed areas, restore landscaping or vegetation as necessary, and clean up the job site. The LEU portion of the project will not have disturbed areas requiring landscaping or vegetation restoration. LEU will repave as appropriate and clean up their job sites.

1.4 Project Schedule

The preliminary proposed schedule indicates that construction is targeted to start in approximately July 2026 and all construction of the project is estimated to be complete by approximately April 2029. The schedule may be subject to change depending upon permitting and approval time frames. Construction is anticipated to occur 6 days per week during daylight hours. This schedule accounts for expected weather conditions for a typical fall and winter, including rain and fog. Applicable city, county, state, federal, and railroad regulations, ordinances, and restrictions will be identified and complied with prior to and during construction.

1.5 Operations and Maintenance

Existing operation and maintenance (O&M) crews for both PG&E and LEU will add their new and modified transmission lines, power lines, and stations to their existing operation and maintenance activities in the area. No changes to existing operation and maintenance crew size are anticipated as a result of this project. PG&E O&M activities will be covered by its *San Joaquin Valley Operation and Maintenance Habitat Conservation Plan* (SJVHCP). PG&E will implement SVHCP avoidance and minimization measures when conducting Inspections (O&M activity E2) and Electrical System Tower Replacement or Repair (O&M activity E6) (Jones & Stokes 2006).

2. Environmental Setting

2.1 Regional Setting

Beginning in 1992, the U.S. Forest Service has worked to develop a consistent approach to ecosystem classification and mapping at multiple geographic scales. The goal is to develop a stratification system for progressively smaller areas of increasingly uniform ecological potentials based on climate, physiography, water, soils, air, hydrology, and potential natural communities. This project is located within the Great Valley Section of the California Dry Steppe Province. The Project is within the Hardpan Terraces and Sodic Claypan Terraces subsections (Miles and Goudey 1997).

Geomorphology within the Hardpan Terraces subsection is described as very gently to gently sloping terraces and small areas of floodplain and alluvial fans along streams that cross from mountains to reach the Sacramento and San Joaquin Rivers. The Sodic Claypan Terraces are described as nearly level to gently sloping late Pleistocene and recent alluvial fans from the southern end of the northern California Coast Ranges. Alluvium within these subsections is formed from volcanic, granitic, sedimentary, and metamorphic rock sources. Fluvial erosion and deposition are the main geomorphic processes within the region (Miles and Goudey 1997).

The regional topography generally is flat with rolling hills increasing to the east. Elevation ranges from approximately 135 feet above sea level at the eastern end of the project to approximately 60 feet at the western end of the project.

2.2 Project Setting

2.2.1 Land Use

Land use in northeastern San Joaquin County is predominantly agricultural with retail wineries, as well as rural and semi-rural residential development outside of the City of Lodi, and small concentrated areas of industrial and commercial business along transportation corridors. Agriculture land use is primarily wine grapes with some fruit and nut orchards, grain fields, and cattle grazing.

2.2.2 Vegetation Types and Land Cover

The majority of upland habitat observed throughout the BSA is either hardscaped (pavement and sidewalks) or otherwise developed/landscaped, agriculture, or is disturbed habitat consisting of primarily ruderal or non-native species. Representative vegetation alliances from the *Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) are referenced and discussed in the following sections.

2.2.2.1 Wetlands

Eight depressional seasonal wetlands were delineated within the BSA along the proposed PG&E 230 kV transmission line. Vegetation within the wetlands consisted of seaside barley (*Hordeum marinum*), sparse popcornflower (*Plagiobothrys* sp.), annual hairgrass (*Deschampsia danthonioides*), spikerush (*Eleocharis* sp.), and tall flatsedge (*Cyperus eragrostis*). More details on these wetlands can be found in Section 4.2.1.

2.2.2.2 Other Waters

Other waters within the BSA include natural watercourses such as Bear Creek and Paddy Creek, constructed watercourses, and drainage and irrigation ditches. Where emergent vegetation exists, the predominant natural plant communities are *Schoenoplectus* (*acutus, californicus*) Herbaceous Alliance (hardstem and California bulrush marshes), *Juncus* (*oxymeris*, *xiphioides*) Provisional Herbaceous Alliance (irisleaf rush seeps), and *Lolium perenne* Herbaceous Semi Natural Alliance (perennial rye grass fields). Vegetation within the creeks and along the creek banks is variable, but predominantly includes species such as bulrush (*Schoenoplectus* ssp.), perennial ryegrass (*Festuca perennis* [*Lolium perenne*]), irisleaf rush (*Juncus xiphioides*), and curly dock (*Rumex crispus*). More details on these aquatic features can be found in Section 4.2.2.

2.2.2.3 Riparian

Sparse riparian vegetation occurs along the banks of Bear Creek, Paddy Creek, and a realigned tributary to Paddy Creek, where these features bisect the proposed PG&E 230 kV transmission line. In general, the riparian corridors within the BSA are narrow, confined by steep slopes, and sparsely vegetated. Riparian vegetation within the BSA consists mostly of non-native grasses, sparse willows (*Salix* ssp.) along Bear Creek and Paddy Creek, and a few small, planted oaks (*Quercus agrifolia*) and black walnut trees (*Juglans* sp.) along the realigned tributary to Paddy Creek.

2.2.2.4 Grassland

Annual grasslands occur throughout the BSA, in pastures, along roadsides, and in other undeveloped, disturbed areas. Annual grassland can most readily be classified as annual brome grasslands within the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Herbaceous Semi-Natural Alliance and *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance, and *Lolium perenne* (*Festuca perennis*) Herbaceous Semi-Natural Alliance (perennial rye grass fields). Where these alliances occur, rip-gut brome (*Bromus diandrus*), seaside barley, foxtail barley (*Hordeum murinum*), soft chess (*Bromus hordeaceus*), and perennial ryegrass are dominant or co-dominant with other non-natives such as black mustard (*Brassica nigra*), fennel (*Foeniculum vulgare*), and bristly ox-tongue (*Helminthotheca echioides*) in the herbaceous layer. Additionally, *Brassica nigra* – *Centaurea* (*solstitialis*, *melitensis*) Herbaceous Semi-Natural Alliance occurs within annual grasslands in low cover, most commonly in close proximity to roadsides and other developed areas.

2.2.2.5 Agriculture

Agricultural monocultures of almond, cherry, and peach (*Prunus* spp.), as well as walnuts (*Juglans* spp.), vineyards, and corn (*Zea mays*), were observed in the large portions of developed agricultural land throughout the BSA.

2.2.2.6 Ruderal

Ruderal habitat is common in highly disturbed areas, including along roadways, at the edges of hardscape development, and at other infrastructure areas such as levees and railroads. Ruderal habitat is characterized by a lack of vegetation or is dominated by non-native or invasive plant species such as Italian thistles (*Carduus* spp.), yellow starthistle (*Centaurea solstitialis*), black mustard, foxtail barley, filaree (*Erodium botrys*), perennial pepperweed (*Lepidium latifolium*), and stinkwort (*Dittrichia graveolens*), among others.

Brassica nigra – *Centaurea* (*solstitialis*, *melitensis*) Herbaceous Semi-Natural Alliance (upland mustards or starthistle fields) also is prevalent around the ruderal margins of the concrete hardscapes along creek banks and levees.

2.2.2.7 Developed/Disturbed

Developed areas include existing paved roadways and parking lots, railroad areas, residential, commercial, and industrial development, and areas where vegetation is regularly cleared. These areas generally lack vegetation entirely or have only scattered weedy grasses and forbs. The developed area also includes a portion of the Lodi Memorial Park and Cemetery located northeast of the intersection of East Lodi Avenue and South Guild Avenue that consists of gravestones, mowed grass, and a large stand of trees. The cemetery is bordered by a fence.

2.2.3 Geology and Soils

Soils information for the BSA was obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2022a) as well as the Official Soil Series Descriptions (NRCS 2022b). Figure 3 presents the soil types within the BSA and Table 1 presents additional information about the mapped soil series.

2.2.4 Climate and Precipitation

The regional climate is characterized by mild winters and hot, dry summers. Based on long term (1893 to 2015) data collected at the Lodi Cooperative Observer Network Station (Station 045032), the average annual rainfall is approximately 17 inches, occurring between November and March. Average monthly temperatures range from a low of 37 degrees Fahrenheit (^{o}F) in January to a high of 92^{o}F in July (WRCC 2021).

2.2.5 Hydrology

The majority of the BSA is located within the Bear Creek watershed (Hydrologic Unit Code [HUC] 1804000304) and Middle River-San Joaquin River watershed (HUC 1804000309), within the larger San Joaquin Delta watershed (HUC 18040003). The Bear Creek watershed drains approximately 81,214 acres, while the Middle River-San Joaquin River watershed drains 135,876 acres. Collectively, these watersheds drain to the San Joaquin River and then to San Pablo Bay.

Regionally, streams drain to the Sacramento or San Joaquin Rivers, or to closed basins in the San Joaquin Valley. All but the larger streams are dry during the summer. There are no lakes in the vicinity of the BSA, but temporary ponding in vernal pools on older Pleistocene terraces or on older alluvial fans was historically common (Miles and Goudey 1997). Much of the natural hydrology in the vicinity of the project has been altered by channel realignments and diversions for irrigation and other water control measures. In addition, the expansion of developed and agricultural land uses and associated grading have greatly altered the distribution and function of seasonal wetlands and swales.

The dominant hydrologic features within the BSA include intermittent Paddy Creek and perennial Bear Creek, as well as constructed irrigation canals and ditches. Surface hydrology within the BSA is influenced primarily by stormwater runoff into drainage channels, some of which then drain to larger linear features. Paddy Creek drains westward to Bear Creek, which continues flowing to the southwest. Bear Creek outlets into Pixley Slough approximately 9 miles southwest of the project BSA, which then drains to the San Joaquin River.

Table 1. Mapped Soil Series within the BSA and Vicinity

Type / Series	Texture	Landscape Position and Parent Material	Drainage and Permeability	Hydric Soil?
Acampo	Sandy loam	Acampo soils are on low fan terraces. The soils formed in alluvium derived from granite.	Moderately well drained; slow runoff; moderately rapid permeability	No
Archerdale	Very fine sandy loam	Archerdale soils are on low fan terraces and alluvial fans. The soils formed in alluvium from mixed rock sources.	Well drained; slow runoff; slow permeability	No
Bruella	Sandy loam	Bruella soils are on low terraces and fans. They formed in alluvium derived mainly from granitic rock sources.	Well and moderately well drained; slow runoff; moderately slow permeability (hard substratum phase has slow permeability below a depth of 40 inches); some areas are subject to rare flooding	No
Cometa	Sandy loam	Cometa soils are on gently sloping and undulating, slightly dissected older stream terraces. The soils formed in alluvium from granitic rock sources.	Moderately well or well drained; slow to medium runoff; very slow permeability	No
Kingdon	Fine sandy loam	Kingdon soils are on low fan terraces. The soils formed in alluvium derived mainly from granitic rock sources.	Moderately well drained; slow runoff; moderate permeability	No
Montpellier-Cometa Complex	Coarse sandy loam	Montpellier-Cometa Complex soils are on fan remnants. The soils formed from alluvium derived from granitic rock.	Well drained; high runoff	No
Rocklin	Sandy loam/ Fine sandy loam	Rocklin soils are on nearly level to rolling dissected terraces of fan remnants. The soils formed in old alluvium from granitic rock sources.	Well drained; very slow to medium runoff; moderate permeability above cemented material but very slow to slow below	No
San Joaquin	Sandy loam/ Loam	San Joaquin soils are on hummocky, nearly level to undulating terraces. They formed in alluvium from mixed but mainly granitic rock sources.	Well and moderately well drained; medium to very high runoff; very slow permeability; some areas are subject to rare or occasional flooding	No
Tokay and Tokay-Urban Land Complex	Fine sandy loam	Tokay soils are on low fan terraces. The soils formed in alluvium derived mainly from granitic rock sources.	Well drained; slow runoff; moderately rapid permeability	No
Tujunga	Loamy sand	Tujunga soils are on alluvial fans and floodplains. The soils formed in alluvium weathered from granitic sources or similar.	Somewhat excessively drained; negligible to low runoff; high saturated hydraulic conductivity; flooding is none to frequent	No

Source:
Web Soil Survey 2.0 National Cooperative Soil Survey (NRCS 2022a)

3. Methods

3.1 Prefield Investigation

General information on climate, vegetation, soils, hydrology, and existing wetlands was reviewed before the field survey. The following materials were included in this data review:

- NRCS Web Soil Survey Soil maps and descriptions (NRCS 2022a and 2022b) (Figure 3)
- United States Geological Survey (USGS) topographic quadrangle maps (Figure 1)
- USGS National Hydrography Dataset (NHD) (USGS 2022) (Figure 4)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2022) (Figure 4)
- Satellite imagery (Google Earth 2022)

3.2 Field Survey

The aquatic resource delineation survey was conducted on April 27, April 28, and May 11, 2021, by Applied Technology and Sciences wetland ecologist Russell Huddleston and Jacobs biologists Mia Marek, Kyle Brown, and Stephanie Owens. A follow-up site survey was conducted on August 11, 2022, by Mia Marek and Stephanie Owens to assess the BSA where it was expanded and survey for potentially jurisdictional aquatic resources within the additional work areas. The aquatic resource delineation was limited to the approximately 387-acre BSA. The aquatic resource delineation survey included all potentially jurisdictional aquatic features, including constructed channels, intermittent and perennial creeks, depressional wetlands, and wet ditches/swales within the BSA. Where the BSA was not safely accessible or extended outside of parcels with approved permit to enter, surveys were conducted visually from accessible areas, along with a review of aerial images, public databases, and available topographic data. Specific survey methodology for these areas is provided in the following sections.

The aquatic resource delineation survey methodology followed the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the ordinary high water mark (OHWM) *Regulatory Guidance Letter No. 05-05* (USACE 2005), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010). Wetland indicator statuses for plants were taken from *The National Wetland Plant List*, version 3.4 (USACE 2018).

The locations of wetland sample points, OHWM transects, and the boundaries of aquatic resources were mapped in the field with a global positioning system receiver with submetric accuracy. Several wetland sample points were collected to document the absence of aquatic features mapped by the NWI or NHD (sample point [SP]1x to SP5x). Geographic information system software (ArcGIS 10.5) then was used to process the collected geodata for developing aquatic resource maps. Cowardin classification codes were assigned to aquatic resources based on guidance from Cowardin et al. (1979).

An irrigation ditch that runs parallel to the access route and partially intersects the project footprint at PG&E structure W9 was observed during the aquatic resource delineation survey on August 11, 2022, at which time it was being used to irrigate a corn crop. The irrigation ditch appears to be seasonally graded and filled, along with the adjacent crop fields when not in use. The irrigation ditch was not apparent during the 2021 aquatic resource delineation surveys; however, the faint signature of the ditch is intermittently visible in aerial images going back several years (Google Earth 2022). While this ditch is presumed to be nonjurisdictional, if it is present during construction, it will be avoided. Placement of this structure will be coordinated with the landowner during final design and construction planning to ensure impacts to this ditch are avoided. The locations of two PG&E proposed structures (W13 and W25) were refined after field surveys were completed and did not impact the results of the survey. The delineation figure and results presented in this report reflect the updated pole locations.

3.2.1 Identification of Wetlands

The USACE uses the three-parameter approach (vegetation, soils, and hydrology) to determine the presence of wetlands. As a general rule, under this method, evidence of a minimum of one positive indicator for each parameter must be found (under normal circumstances and in nonproblem areas) to make a positive wetland determination. Wetland data points were collected according to USACE standards where apparent vegetation, hydrology patterns, and soil moisture gradients indicated that there is the potential for wetlands to occur. Wetland determination data forms are included in Appendix A.

3.2.2 Identification of Other Waters of the U.S.

Riverine aquatic resources were delineated based on guidance provided in USACE *Regulatory Guidance Letter 05-05* (USACE 2005) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). The following physical characteristics were considered when making OHWM determinations: (1) natural line impressed on the bank, (2) shelving, (3) changes in the character of the soil, (4) destruction of terrestrial vegetation, (5) wracking, (6) vegetation matted down, bent, or absent, (7) sediment sorting, (8) leaf litter disturbed or washed away, (9) scour, (10) deposition, (11) bed and banks, (12) water staining, and (13) changes in plant community or cover. OHWM data sheets are included in Appendix A.

4. Results

4.1 Site Conditions at the Time of the Survey

The USACE Antecedent Precipitation Tool (APT) was used to define precipitation conditions over the period of time preceding the 2021 delineation survey, and data were collected for a location at the approximate center of the project alignment. Regional precipitation in the months preceding the 2021 survey was considered to be drier than normal based on the APT data (Table 2) and the data, according to the Palmer Drought Severity Index, indicate extreme drought conditions (Dai et al. 2019). The drought conditions observed at the time of the surveys was not considered a survey limitation, as wetland indicators and indication of flow regimes (OHWM) were still apparent and discernible to the degree needed to accurately map aquatic resources.

Table 2. APT Table for Biological Survey Area: April 2021

Month	Total Observed	30th Percentile	70th Percentile	Condition[a]	Condition Weight Factor[b]	Month Weight Factor	Product[c]
February	2.44	1.58	4.35	Normal	2	1	2
March	1.15	1.71	3.12	Dry	1	2	2
April	0.00	0.82	2.02	Dry	1	3	3
Sum[d]							**7**

Source: APT tables (USACE 2022).

Note:

Data presented is in inches.

[a] If Total (Observed) is between 30th percentile and 70th percentile values, Condition = Normal; if Total (Observed) is less than 30th percentile, Condition = Dry; if Total (Observed) is more than 70th percentile, Condition = Wet.

[b] Dry = 1; Normal = 2; Wet = 3.

[c] Product = Condition Weight x Month Weight

[d] A sum of 6 to 9 is drier than normal; 10 to 14 is normal; 15 to 18 is wetter than normal.

Paddy Creek was dry at the time of the delineation, and Bear Creek had only isolated areas of standing water, with no apparent flow. The drier-than-normal conditions observed are likely the result of the drought conditions during the time of the survey. Shallow surface water was observed in some constructed irrigation channels.

4.2 Aquatic Resources

The field delineation identified a total of eight seasonal wetlands comprising approximately 0.200 acre, approximately 0.247 acre (approximately 359 linear feet) of natural watercourses (1 perennial and 1 intermittent stream), approximately 0.545 acre (approximately 2,775 linear feet) of constructed watercourses, approximately 0.127 acre (approximately 1,805 linear feet) of drainage ditches, and approximately 0.152 acre (approximately 1,654 linear feet) of irrigation ditch in the BSA. Table 3 presents an overview of the types and amounts of potential jurisdictional waters in the BSA, and descriptions of the delineated features are presented in the following paragraphs. The delineated aquatic resources are shown in Figure 5. USACE wetland and OHWM data sheets are presented in Appendix A, and representative photographs are presented in Appendix B.

4.2.1 Wetlands

A total of eight depressional seasonal wetlands were delineated within the BSA (Table 3, Figure 5). These wetlands are shallowly concave basins that may fill with water during wet winter months and are dry for the remainder of the year. All seasonal wetlands were dry at the time of the field survey. All of the basins were moderately to very degraded or disturbed as a result of adjacent land use, and none represent vernal pool habitat. Wetland data sample sheets can be found in Appendix A, and representative site photos can be found in Appendix B.

4.2.2 Other Waters

4.2.2.1 Natural Watercourses

Natural watercourses within the BSA include Bear Creek and Paddy Creek. Bear Creek was mostly dry at the time of the survey, with areas of standing water. Paddy Creek was entirely dry. Only small portions of these waters occur within the project area, totaling approximately 0.246 acre and 3 approximately 59 linear feet. OHWM data sheets can be found in Appendix A, and representative site photos can be found in Appendix B.

4.2.2.2 Constructed Watercourses

Three constructed watercourses were delineated within the BSA, including two realigned tributaries to Paddy Creek and an irrigation canal constructed in uplands. Constructed watercourses delineated within the BSA total approximately 0.545 acre and approximately 2,775 linear feet. The realigned tributaries to Paddy Creek had some standing water at the time of the survey. OHWM data sheets can be found in Appendix A, and representative site photos of the drainage ditches can be found in Appendix B.

4.2.2.3 Drainage Ditches

Seven drainage ditches were observed within the BSA and appear to flow or convey water in direct response to storm events. These features are not associated with existing streams or realigned tributaries. These drainages do not appear to convey a protracted water supply from groundwater, seepage, or other sources. Geomorphic indicators used in the delineation of drainage ditches included break in slope and debris deposits. Representative site photos of the drainage ditches can be found in Appendix B.

4.2.2.4 Irrigation Ditch

One irrigation ditch (ID-1) was observed within the BSA. The irrigation ditch is an earthen feature that appears to be maintained (excavated) annually during the growing season and is not readily apparent the remainder of the year. The irrigation ditch appears to convey flow from constructed watercourse 3 (CW-3) to cornfields (Figure 5). No indicators of active surface hydrology or of an OHWM were apparent during the 2021 aquatic resource delineation surveys. A constructed (excavated) OHWM and flowing surface water was apparent during the August 11, 2022, survey, demonstrating the seasonally excavated nature of the ditch. Similarly, the feature is only intermittently visible in historic aerial imagery (Google Earth 2022).

Table 3. Aquatic Resources Delineated within the Biological Study Area

Feature ID	Cowardin Code[a]	Latitude/[a] Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
WETLANDS						
Seasonal Wetlands						
SW-1	PEM	38.120823/ -121.101059	0.005	--	2	Seasonal wetland SW-1 is a shallow depressional seasonal wetland adjacent to a proposed access road. Wetland basin dominated by seaside barley. Facultative (FAC). Feature extends to the west outside of the BSA.
SW-2	PEM	38.121409/ -121.102745	0.045	--	2	Seasonal wetland SW-2 is a shallow seasonal wetland swale near new proposed pole E5 that appears to have been historically connected to a broader wetland-swale complex. Wetland basin is dominated by seaside barley. Feature extends to the southwest outside of the BSA.
SW-3	PEM	38.121224/ -121.105933	0.009	--	2	Seasonal wetlands SW-3, 4, 5, and 6 are all shallow seasonal wetland depressions that appear to have been historically connected hydrologically through a network of wetland-swale complexes. The wetland basins are dominated by seaside barley. Sparse popcornflower (*Plagiobothrys* sp.), a Facultative Wet (FACW) or Obligate (OBL) wetland plant, occurs within the basin centers. The wetland swale complex extends to the south and west, outside of the BSA.
SW-4	PEM	38.121315/ -121.105989	0.002	--	2	
SW-5	PEM	38.121126/ -121.106146	0.004	--	2	
SW-6	PEM	38.121216/ -121.106555	0.032	--	2	
SW-7	PEM	38.121695/ -121.110017	0.076	--	2	Seasonal wetland SW-7 is a shallow depressional seasonal wetland that was inaccessible at the time of the survey and was digitized using aerial imagery and topographic signatures. Dominant species include seaside barley and annual hairgrass (*Deschampsia danthonioides*, FACW).
SW-8	PEM	38.119253/ -121.121876	0.027	--	3	Seasonal wetland SW-8 is a shallowly depressed mesic meadow that was inaccessible at the time of the survey and was digitized using aerial imagery and topographic signatures. The wetland feature occurs adjacent to the proposed access route. The wetland is dominated by sprikerush (*Eleocharis* sp., OBL) and tall flatsedge (*Cyperus eragrostis*, FACW).
Approximate Total Wetlands			***0.200***	--		

Feature ID	Cowardin Code[a]	Latitude/[a] Longitude	Approxi-mate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
OTHER WATERS						
Natural Watercourses						
NW-1 (Paddy Creek)	PEM1Cx	38.119775/ -121.147669	0.041	129	5	Paddy Creek is an intermittent tributary to Bear Creek and was dry at the time of the survey. The creek has been diverted for irrigation along its extent. Where it passes through the BSA, the OHWM of Paddy Creek is approximately 30 feet wide, and top of bank is approximately 100 feet wide, extending outside the limits of the BSA. Tall flatsedge and stands of bulrush (*Schoenoplectus* sp.) occur within the creek channel, transitioning to non-native annual grasses above the OHWM. The channel substrate is sandy, with some soil cracking, sediment deposits, and flattened vegetation apparent, evidence of past flow events.
NW-2 (Bear Creek)	R2UBHx	38.107809/ -121.173529	0.205	230	8	Bear Creek is a perennial tributary to Pixley Slough and the San Joaquin River and was mostly dry at the time of the survey. Some areas of wetted soil and shallow ponding were observed. Where it passes through the BSA, The OHWM of Bear Creek is approximately 40 feet wide, with a top of bank approximately 100 feet wide. Stands of bulrush occur throughout the channel and transition to non-native annual grasses upslope of the OHWM. The substrate is a silty sand, with sediment/silt deposits, algae growth, and flattened vegetation apparent, evidence of past flow events.
Approximate Total Natural Watercourse			***0.247***	***359***		
Constructed Watercourses						
CW-1	R5UBFx	38.119906/ -121.146208	0.079	688	5	Constructed watercourse CW-1 is an irrigation channel constructed in uplands that drains to Paddy Creek. The feature is not mapped by the NHD or NWI. Areas of standing water were observed during the survey, approximately 6 to 12 inches deep in spots. Where it passes through the BSA, the OHWM is approximately 4 to 6 feet wide. Dominant vegetation observed along the channel banks includes tall flatsedge, curly dock, and non-native annual grasses.

Feature ID	Cowardin Code[a]	Latitude/[a] Longitude	Approxi-mate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
CW-2	R5UBFx	38.117454/ -121.158468	0.200	1,689	6	Constructed watercourse CW-2 is an intermittent, realigned tributary to Paddy Creek. The NHD identifies CW-2 as a blueline stream and the NWI identifies the feature as riverine, perennial, and excavated. Small areas of very shallow ponding were observed during the survey. The OHWM ranges from approximately 4 to 10 feet wide, and the top of bank is approximately 15 feet wide. Within the OHWM, the channel is largely devoid of vegetation, with water-stained leaves, algae, and faint wracking apparent. A sparse riparian corridor extends along the extent of the watercourse within the BSA with willow (*Salix* sp.), coast live oak (*Quercus agrifolia*), and black walnut (*Juglans* sp.). Herbaceous vegetation within the riparian corridor is dominated by tall flatsedge, cheeseweed (*Malva parviflora*), curly dock (*Rumex crispus*) and non-native annual grasses.
CW-3	R5UBFx	38.109298/ -121.166421	0.266	398	8	Constructed watercourse CW-3 is an excavated, soil-bottom irrigation channel that is connected to Paddy Creek by a mechanical release valve. The NHD identifies CW-3 as a blueline stream, and the NWI identifies the feature as riverine, perennial, and excavated. Water was present in the channel during the survey, although no flow was apparent. Where it passes through the BSA, the OHWM is approximately 25 feet wide. There is no vegetation below the OHWM. Numerous red-eared sliders (*Trachemys scripta elegans*) were observed within the channel.
Approximate Total Constructed Watercourse			***0.545***	***2,775***		
Drainage Ditches						
DD-1	R6	38.119600/ -121.150779	0.010	83	5	Drainage ditch DD-1 is an excavated roadside feature that is approximately 6 feet wide and appears to drain surface flows away from the roadside. The ditch is dominated by cattails (*Typha* sp.).
DD-2	R6	38.120523/ -121.150768	0.05	544	5	Drainage ditches DD-2 and DD-3 are excavated roadside features that appear to convey surface flows away from the road and adjacent agriculture areas. They both range from approximately 2 to 4 feet wide.
DD-3	R6	38.120382/ -121.150986	0.031	681	5	
DD-4	R6	38.119540/ -121.138236	0.009	78	4	Drainage ditch DD-4 is an approximately 5-foot-wide excavated feature that appears to drain surface flows away from the adjacent agriculture areas.

Feature ID	Cowardin Code[a]	Latitude/[a] Longitude	Approximate Area (acres)	Length (linear feet)	Figure 5 Mapbook Page	Description
DD-5	R6	38.120257/ -121.117227	0.001	52	3	Drainage ditch DD-5 is an excavated roadside ditch that appears to convey surface flow away from roadways and agricultural areas.
DD-6	R6	38.117269/ -121.159833	0.016	230	6	Drainage ditch DD-6 is an approximately 3-foot-wide excavated feature that appears to convey surface flow away from the detention pond within PG&E Lockeford Substation, draining to CW-2.
DD-7	R6	38.116884/ -121.160284	0.01	137	6	Drainage ditch DD-7 is an approximately 3-foot-wide excavated roadside feature that appears to convey surface flow away from the roadway and PG&E Lockeford Substation. The feature drains to CW-2.
Approximate Total Drainage Ditches			***0.127***	***1,805***		
Irrigation Ditches						
ID-1	R6	38.107345/ -121.169089	0.152	1,654	8	Irrigation ditch ID-1 is an earthen feature that appears to be maintained (excavated) annually during the growing season and is not readily apparent the remainder of the year. The irrigation ditch delineated within the BSA conveys flow from CW-3 to cornfields.
Approximate Total Irrigation Ditches			***0.152***	***1,654***		

[a] Cowardin, L.M., V. Carter V., F.C. Golet, E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31. Washington, D.C.

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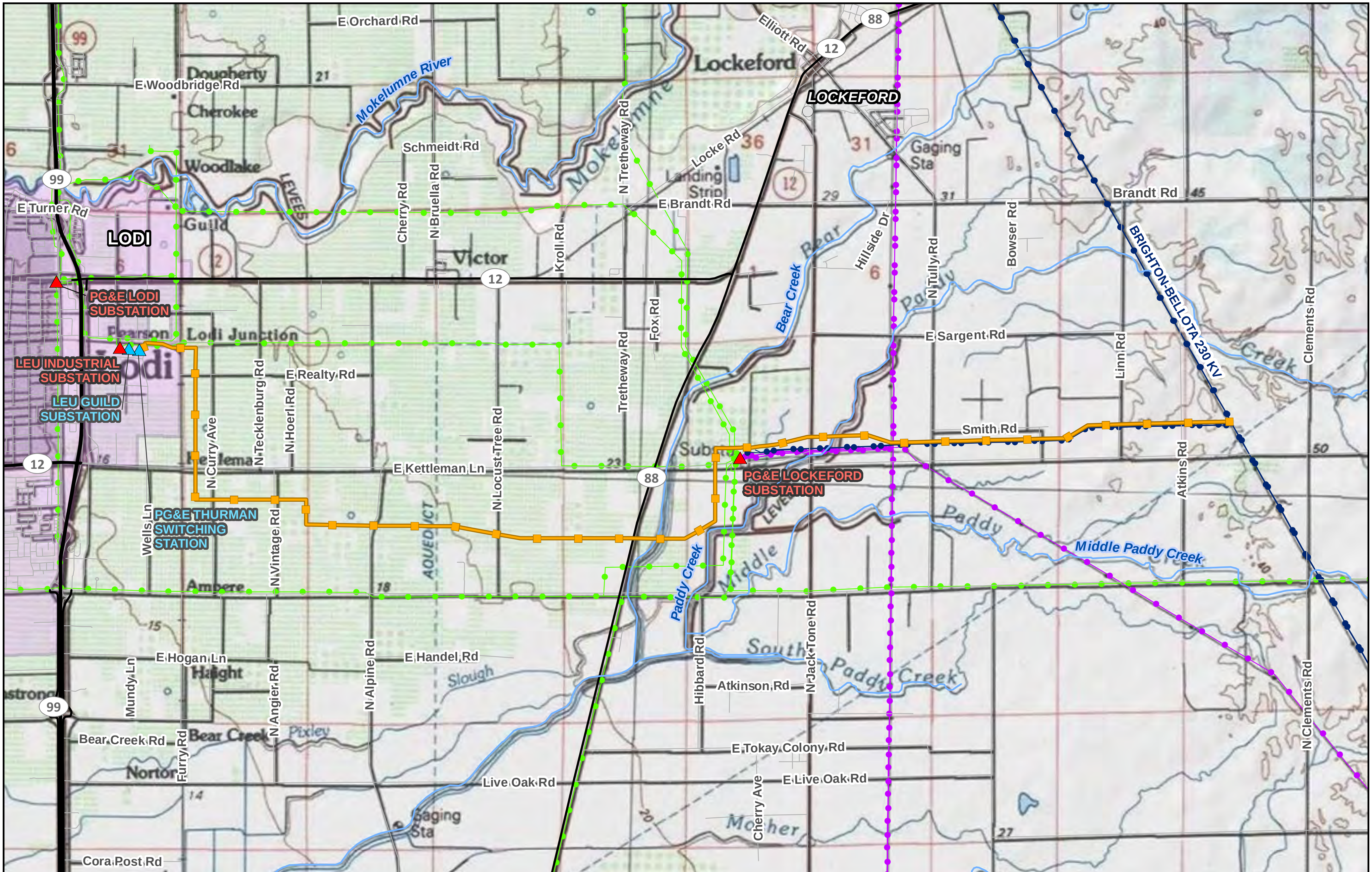
Figures



Legend

- Existing Substation
- New Substation/ Switching Station
- PG&E New 230 kV Transmission Line
- Existing PG&E 60 kV Power Line
- Existing PG&E 115 kV Transmission Line
- Existing PG&E 230 kV Transmission Line
- Major_Roads
- Local Road
- River/Stream
- City Boundary

Source:
1) Base Map Source: Esri USA Topo Maps

0 0.5 1 Miles

N

Scale: 1:65,000

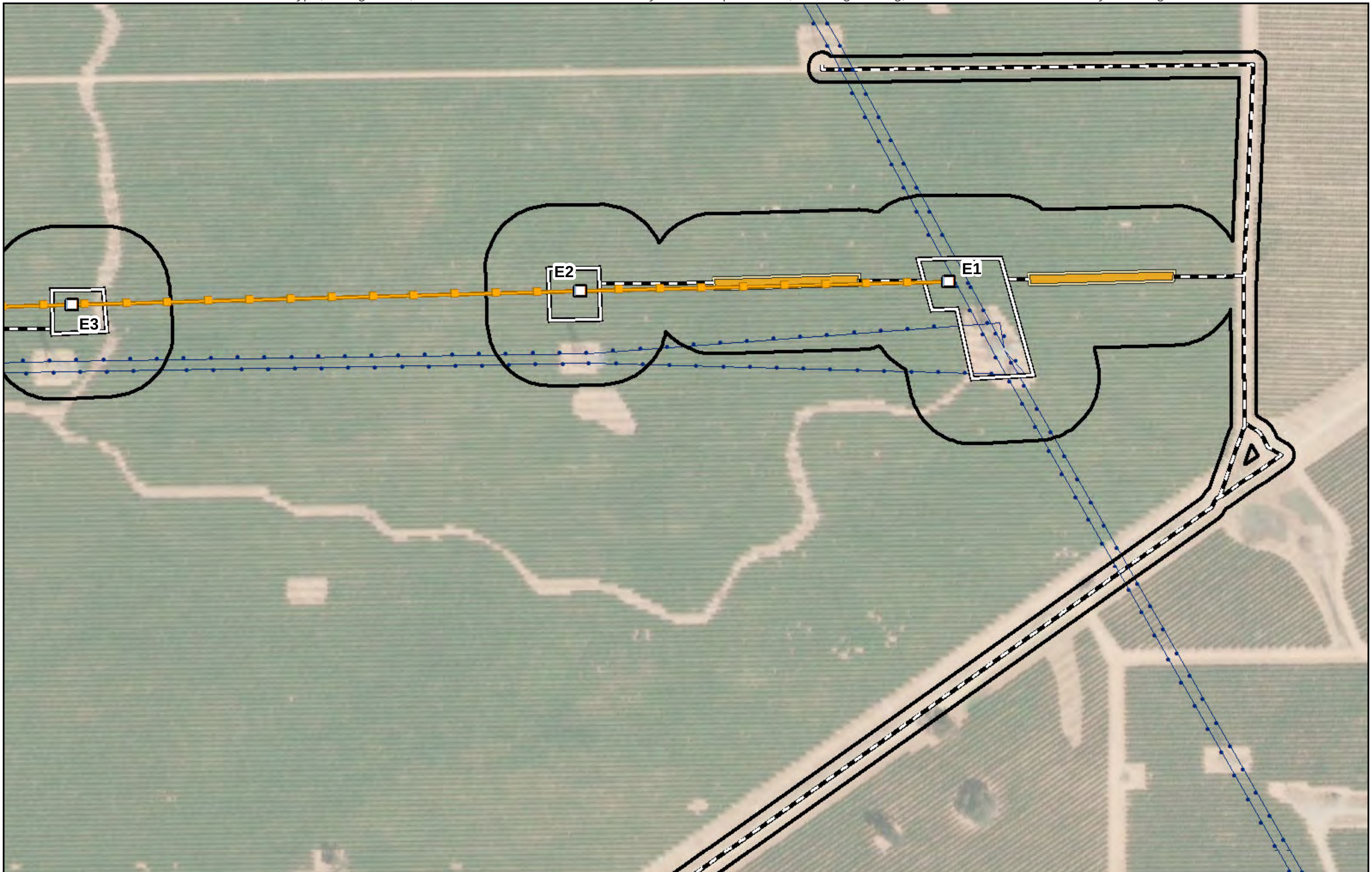
Project Location

Figure 1
Project Location
Northern San Joaquin 230 kV Transmission Project

Jacobs

\\dc1vs01\GISProj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_1_210925.mxd kgrant1 9/20/2022

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

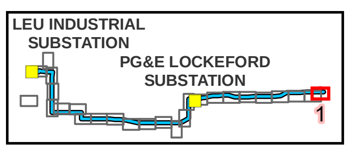


Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 1 of 26
Northern San Joaquin 230 kV Transmission Project

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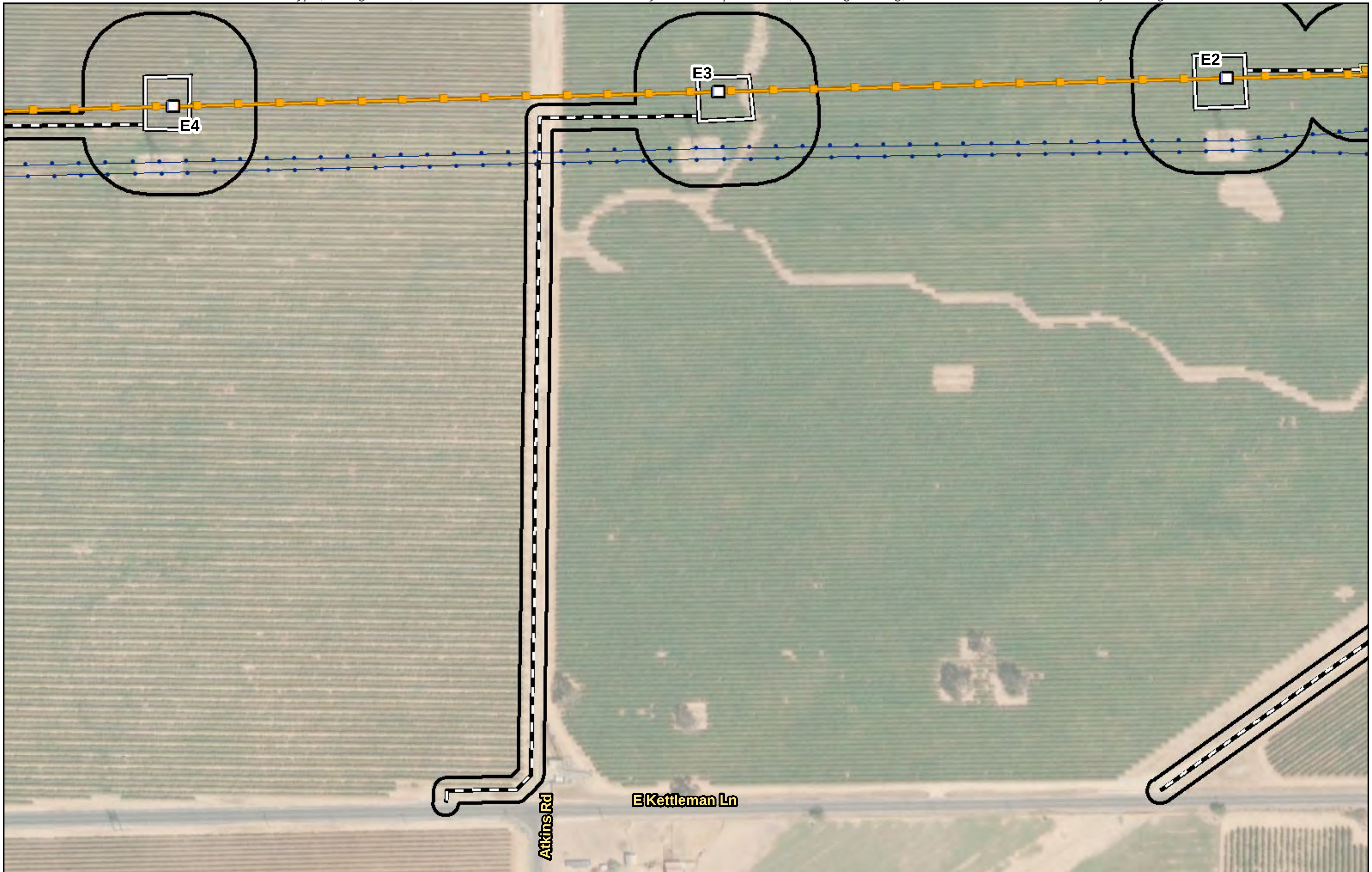
Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

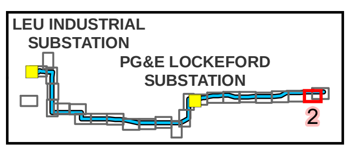


Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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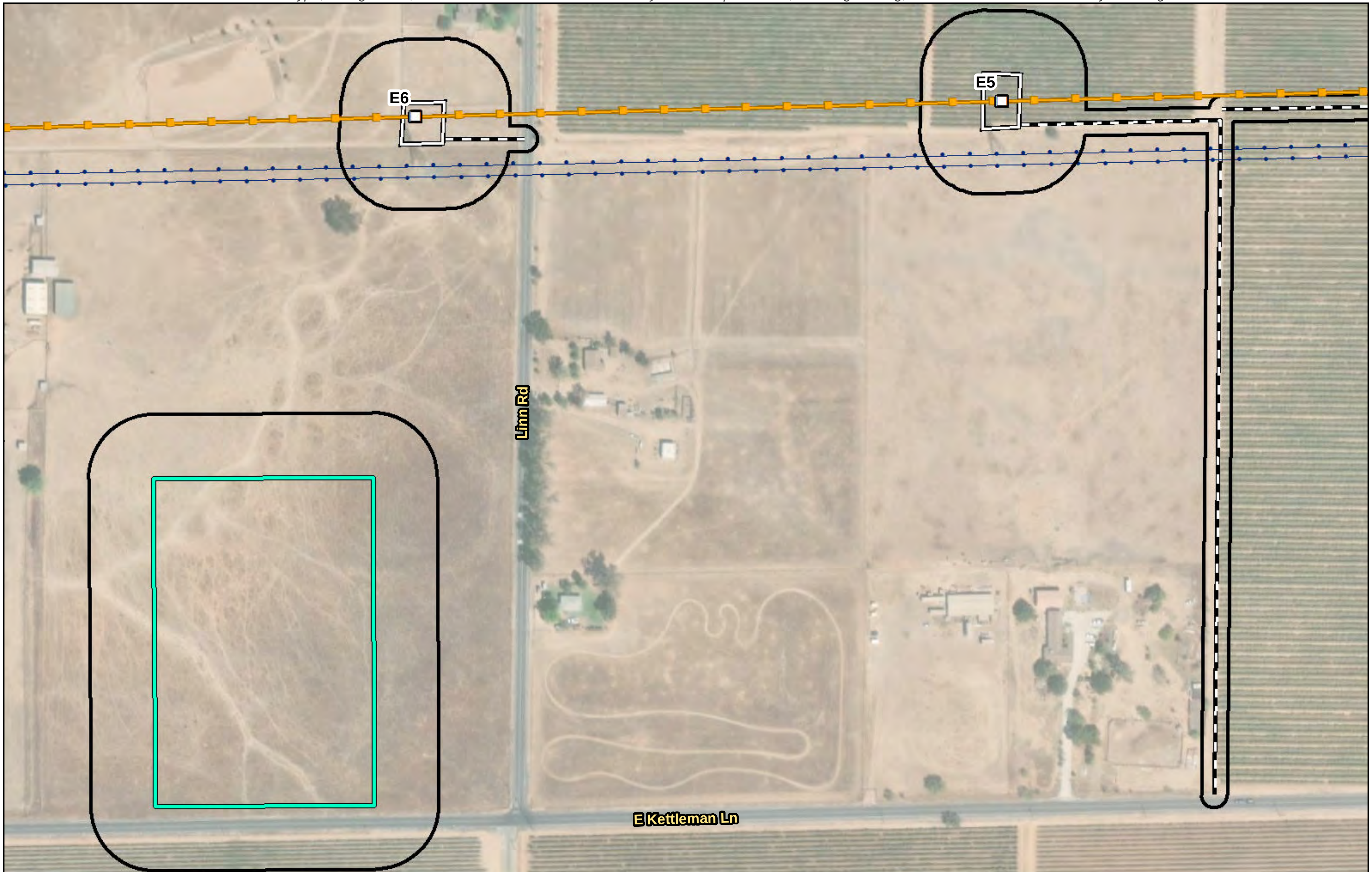
FIGURE 2
Project Elements and Biological Study Area
Page 2 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

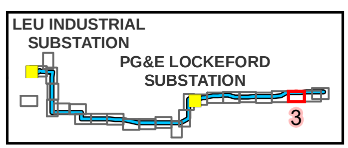


Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area



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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 3 of 26
Northern San Joaquin 230 kV Transmission Project

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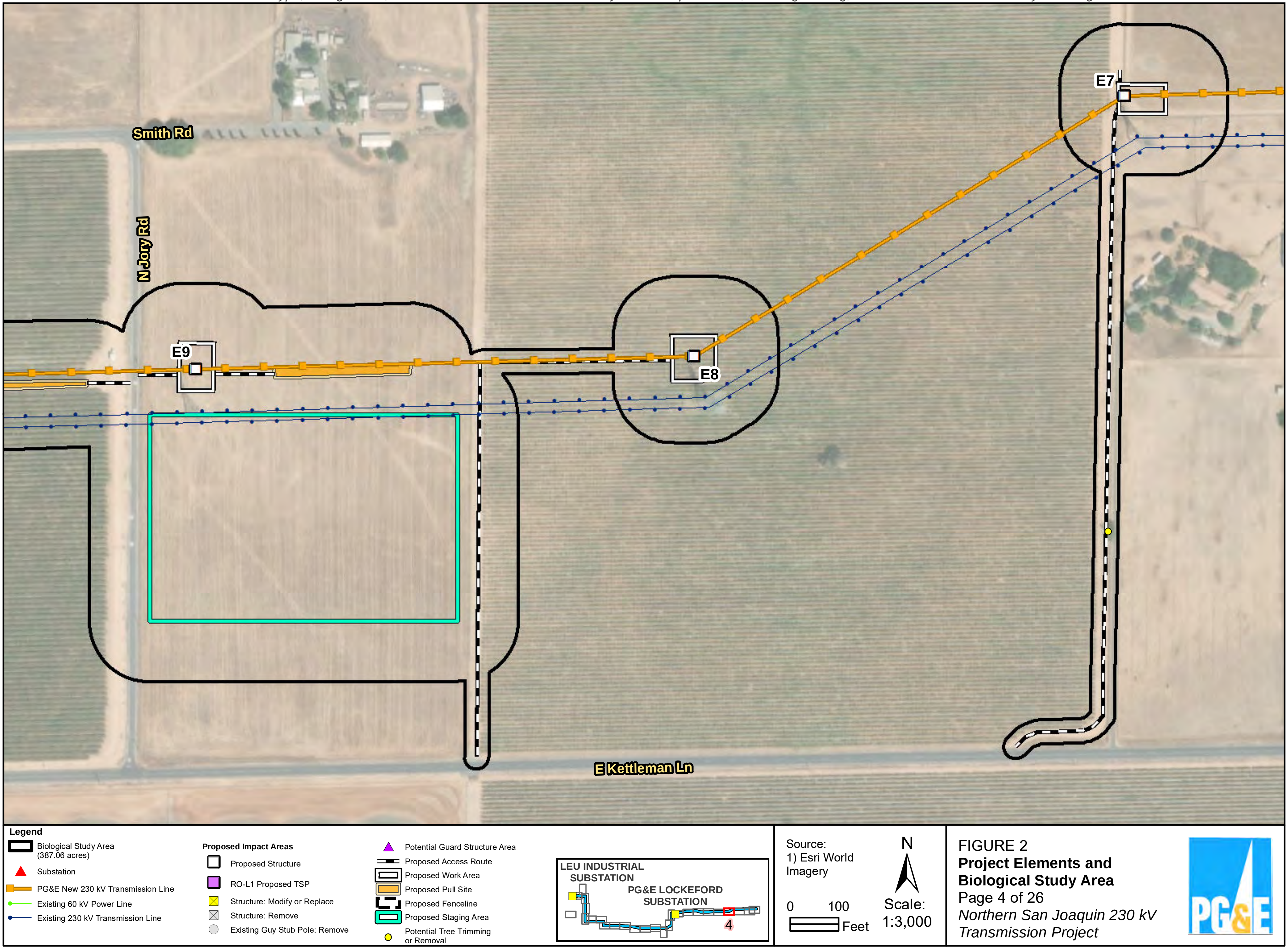

FIGURE 2
Project Elements and Biological Study Area
Page 4 of 26
Northern San Joaquin 230 kV Transmission Project

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Preliminary design and engineering for the physical, civil, and outdoor components.
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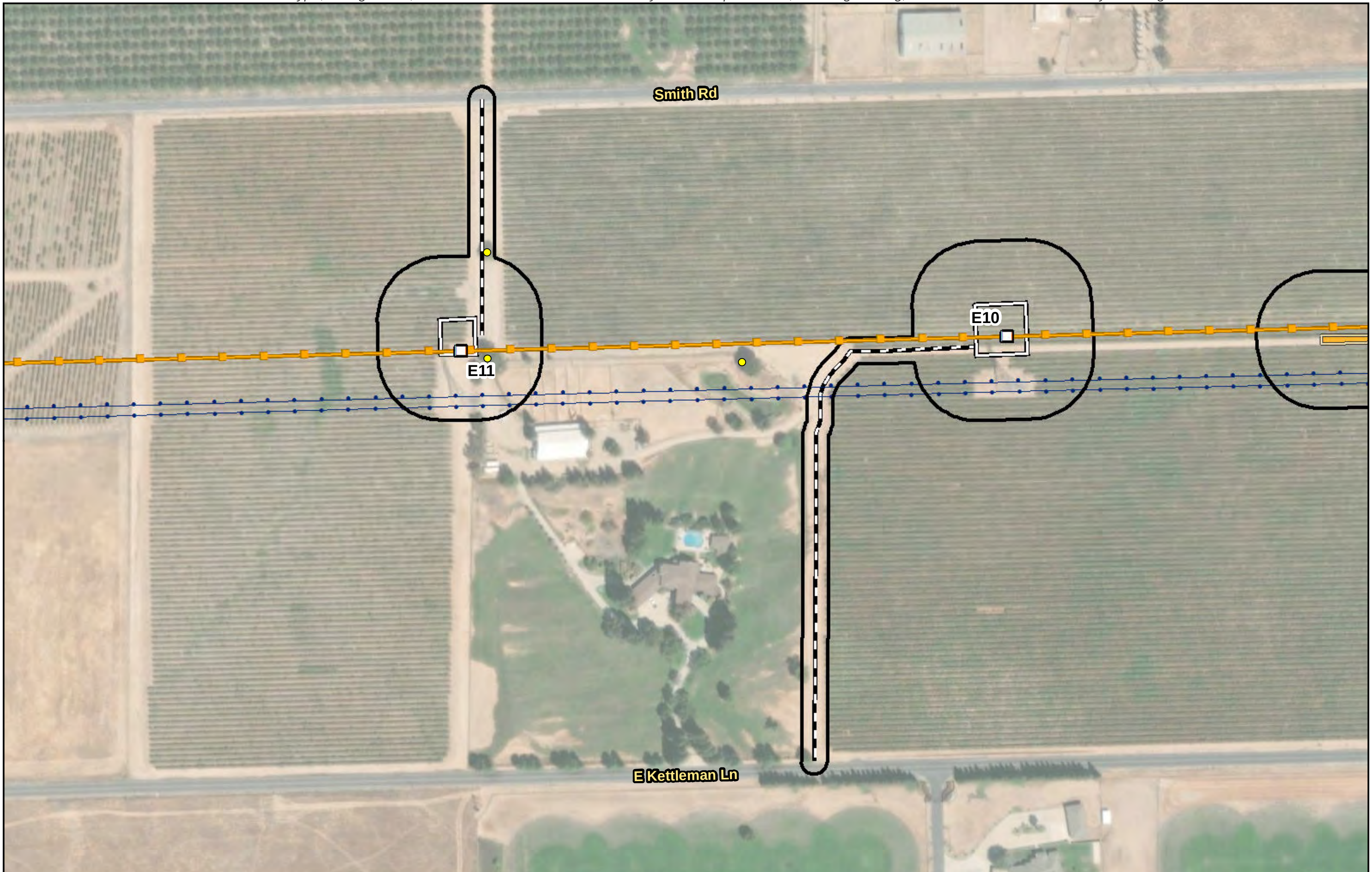
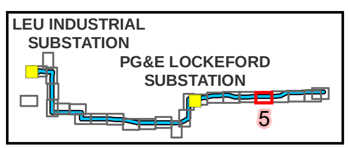


Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal



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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 5 of 26
Northern San Joaquin 230 kV Transmission Project

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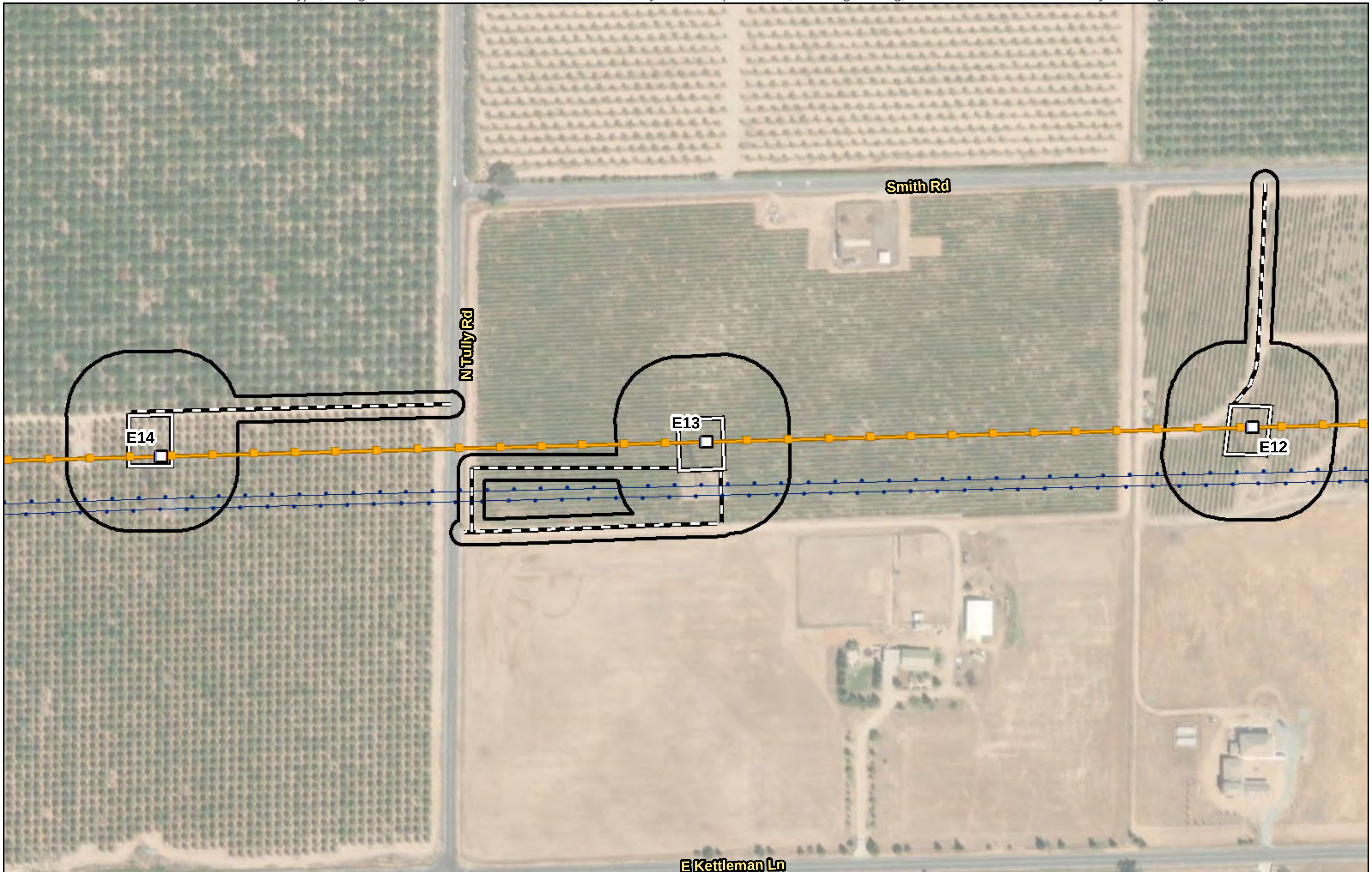

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
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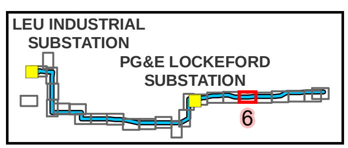

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 6 of 26
Northern San Joaquin 230 kV Transmission Project

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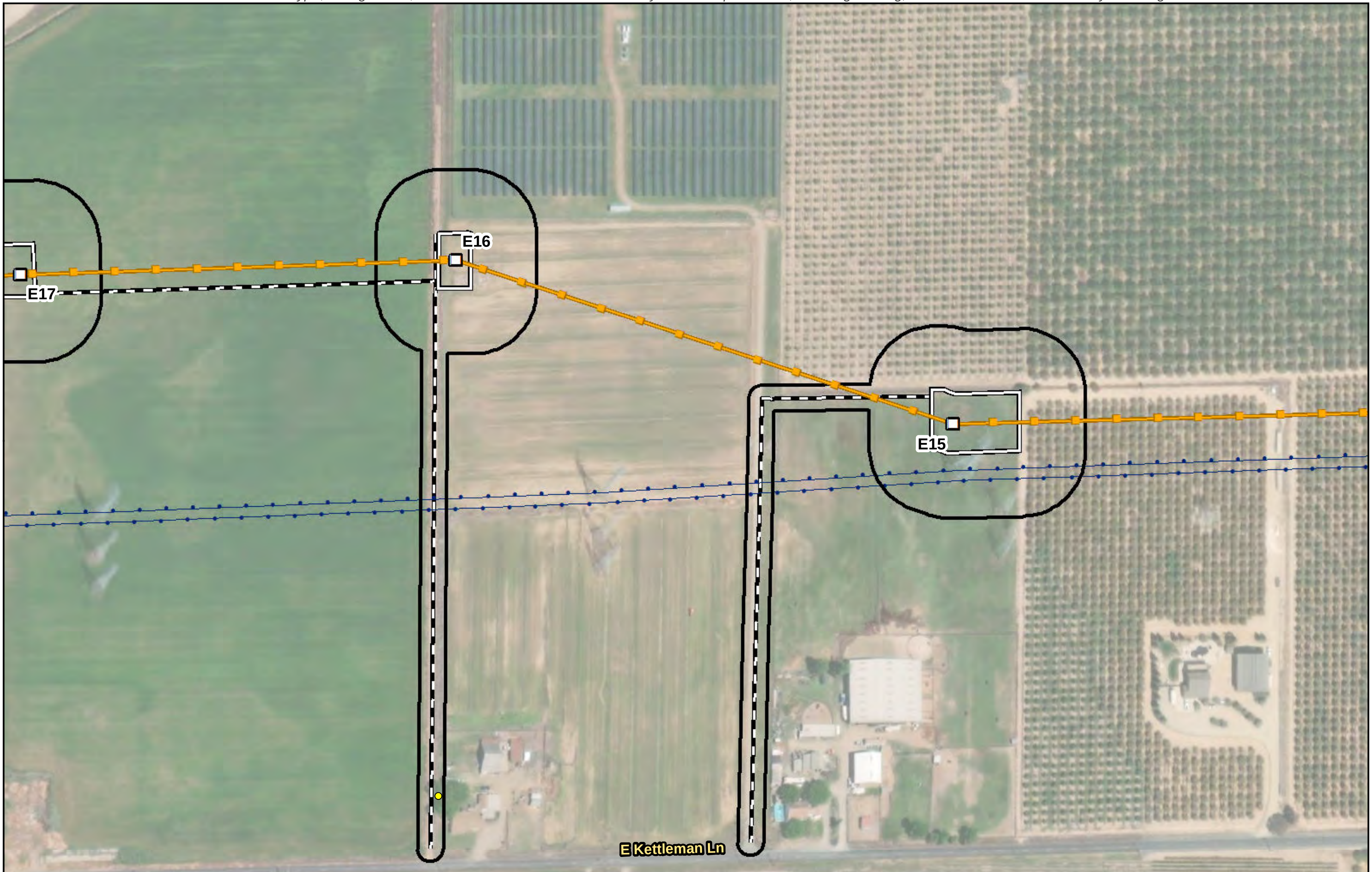

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
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Proposed Impact Areas

- Proposed Structure
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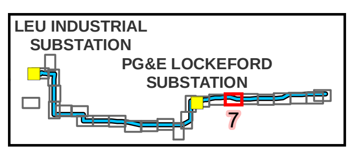
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 7 of 26
Northern San Joaquin 230 kV Transmission Project

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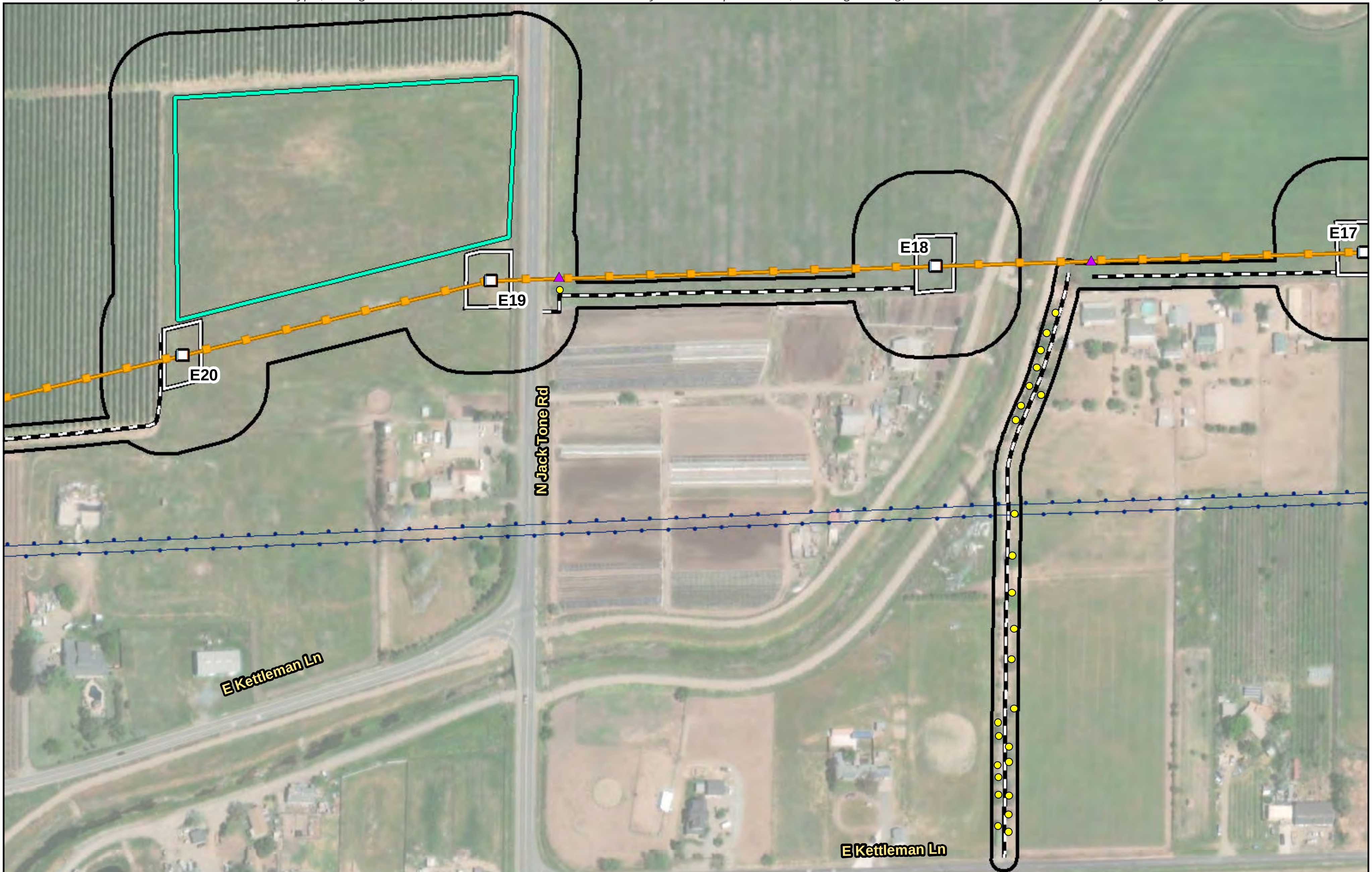

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
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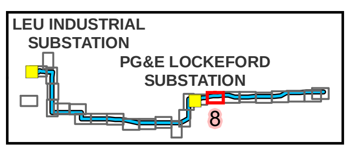

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FIGURE 2
Project Elements and Biological Study Area
Page 8 of 26
Northern San Joaquin 230 kV Transmission Project

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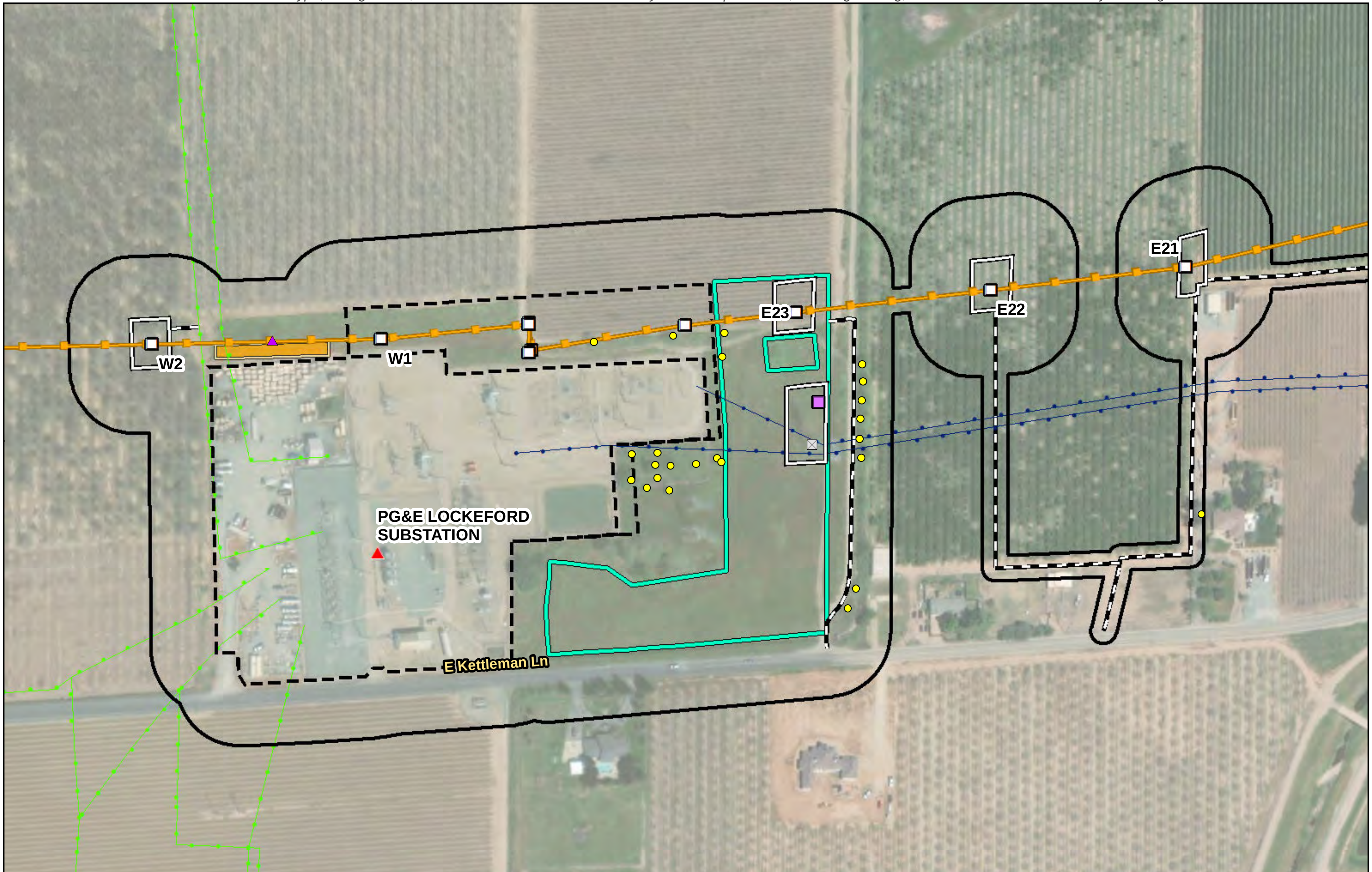

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
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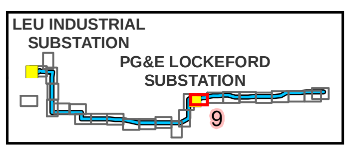

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FIGURE 2
Project Elements and Biological Study Area
Page 9 of 26
Northern San Joaquin 230 kV Transmission Project

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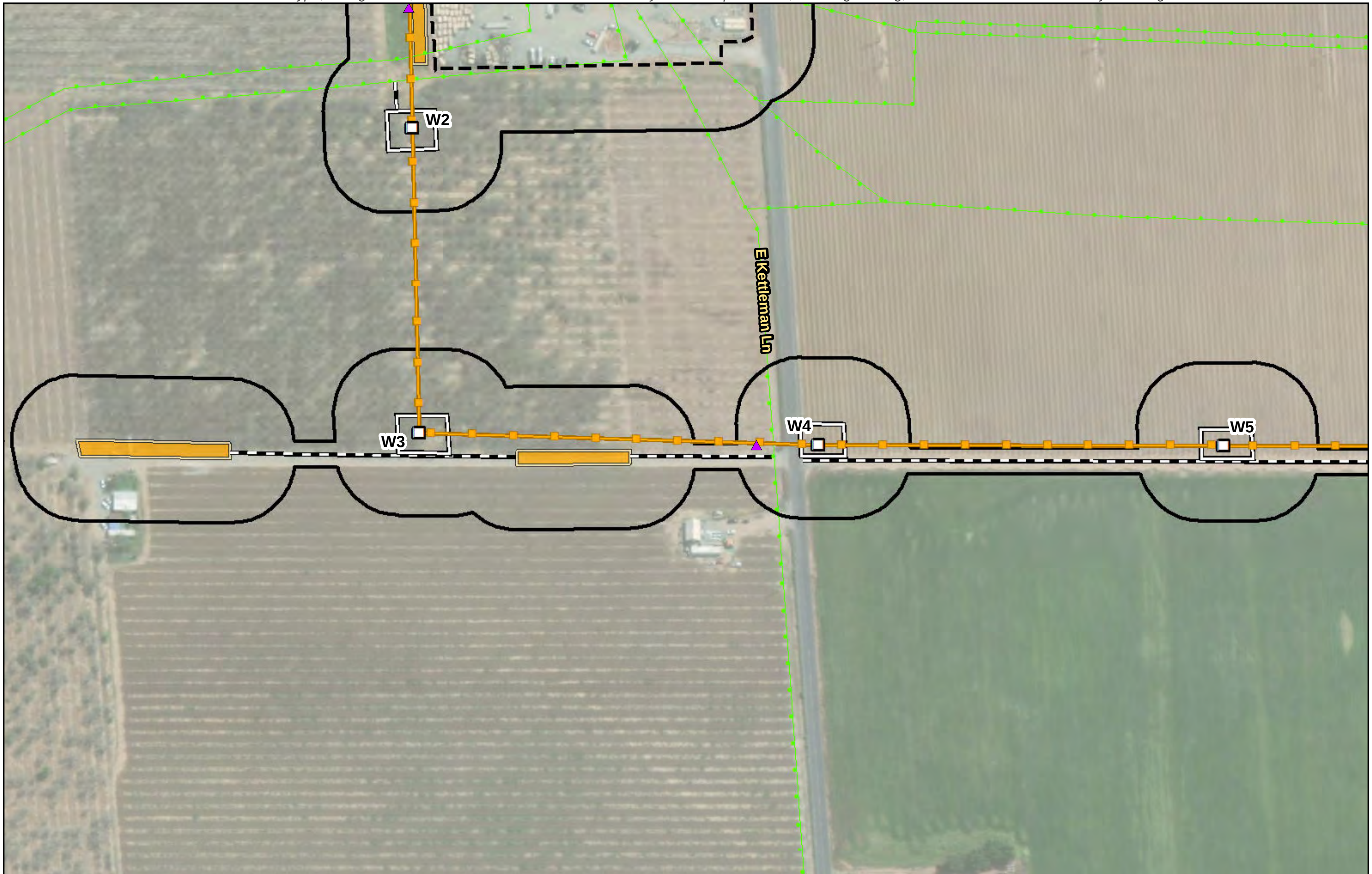

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
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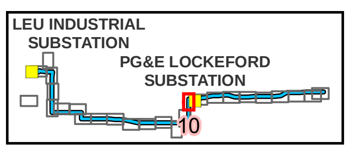
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 10 of 26
Northern San Joaquin 230 kV Transmission Project

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Preliminary design and engineering for the physical, civil, and outdoor components.
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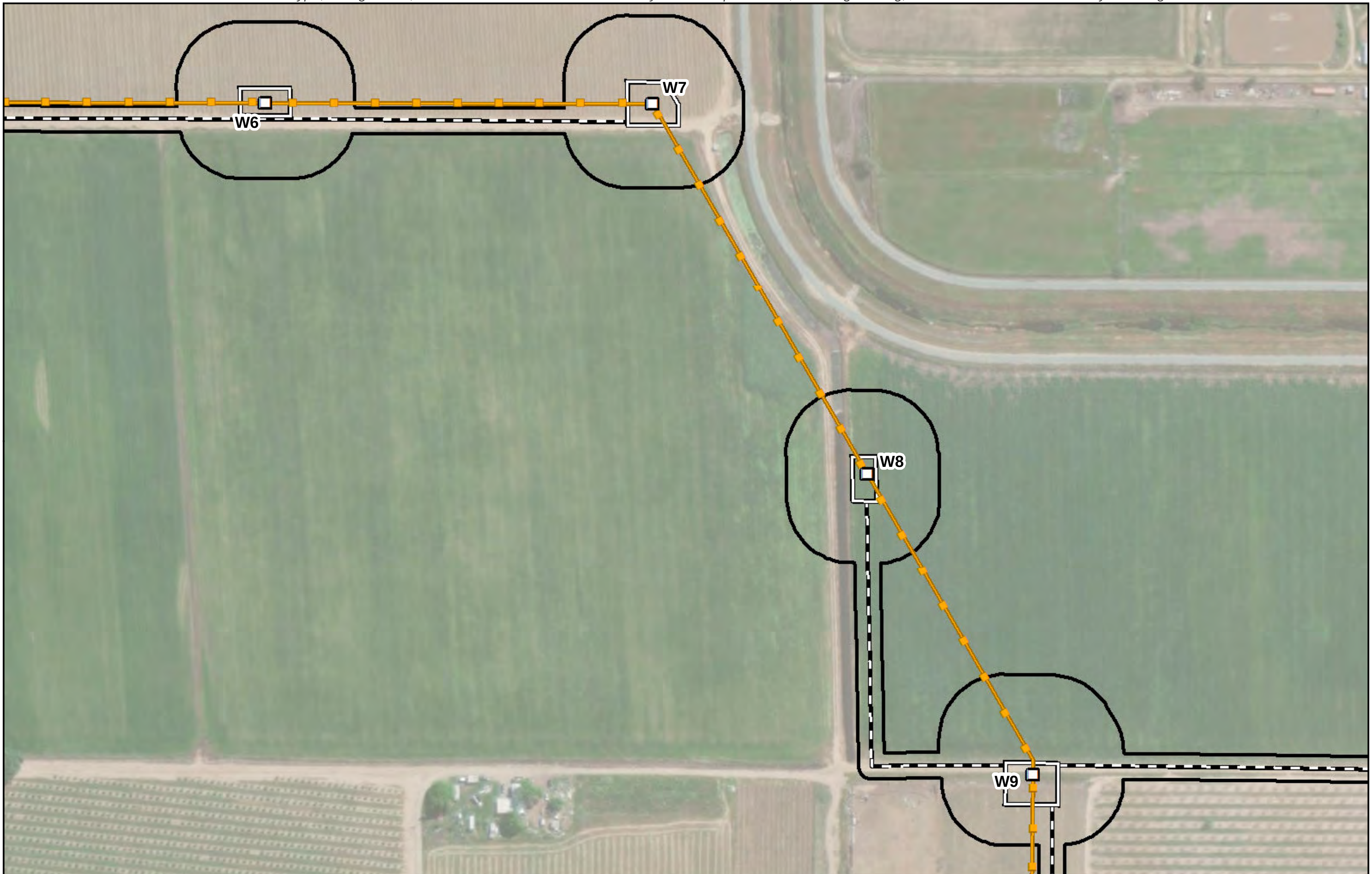

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

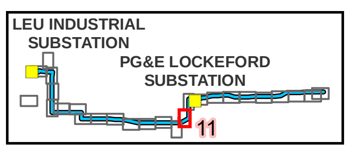

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FIGURE 2
Project Elements and Biological Study Area
Page 11 of 26
Northern San Joaquin 230 kV Transmission Project

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Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

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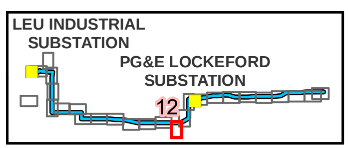
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 12 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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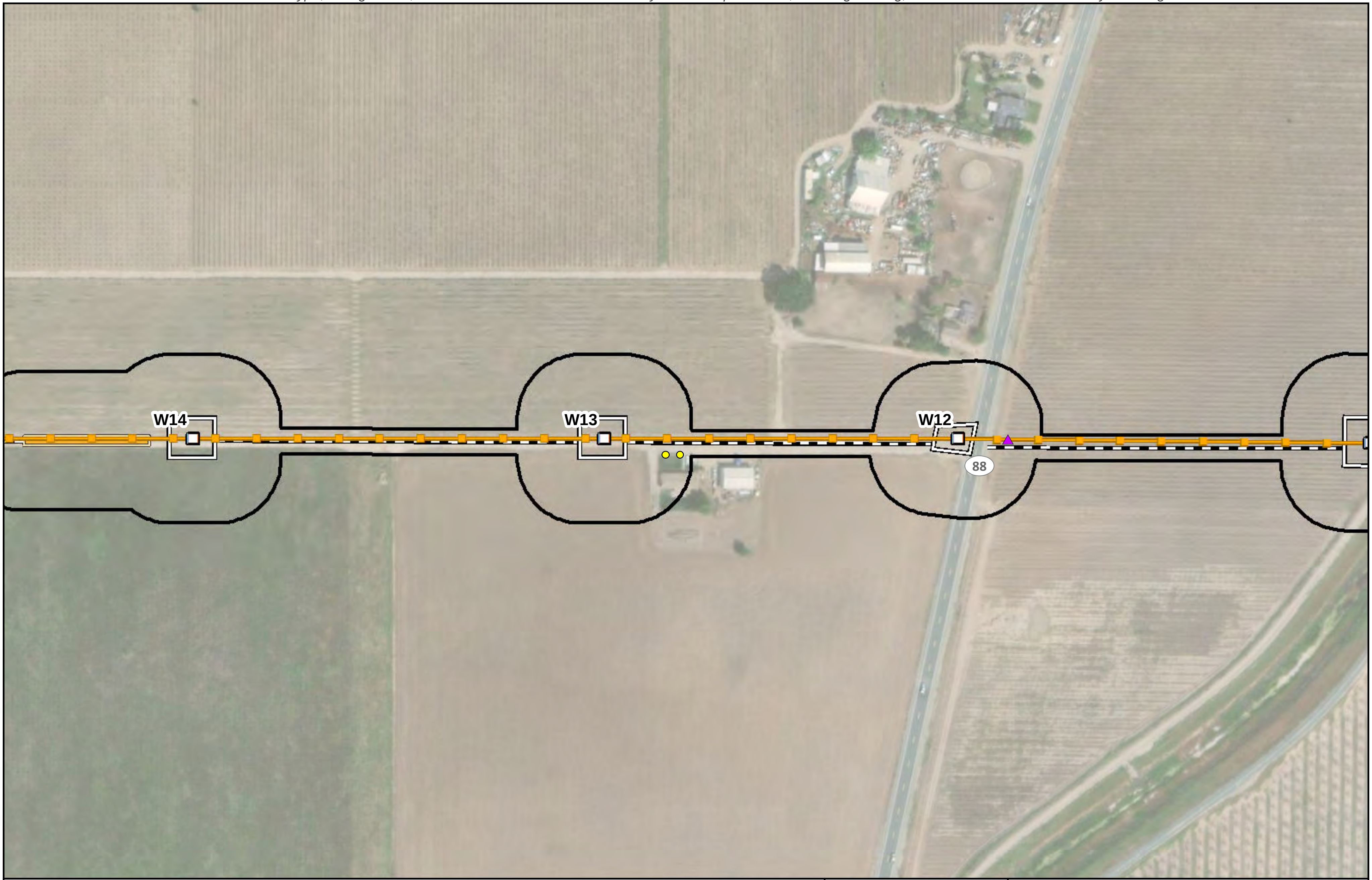

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
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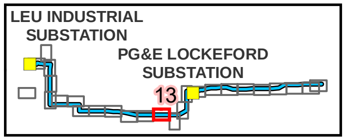
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 13 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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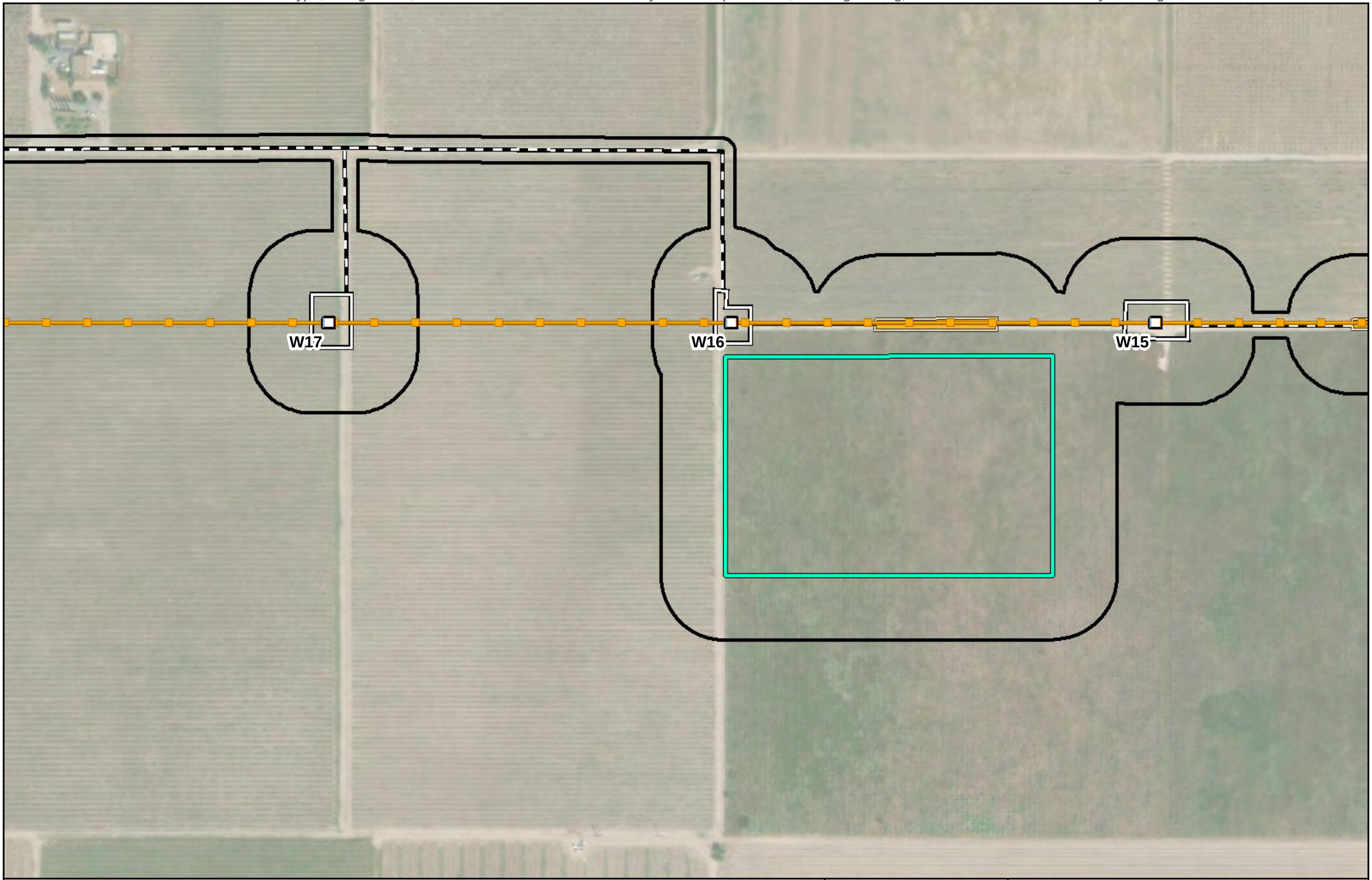

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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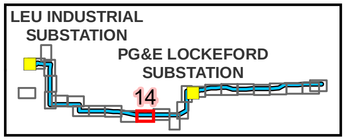

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 14 of 26
Northern San Joaquin 230 kV Transmission Project

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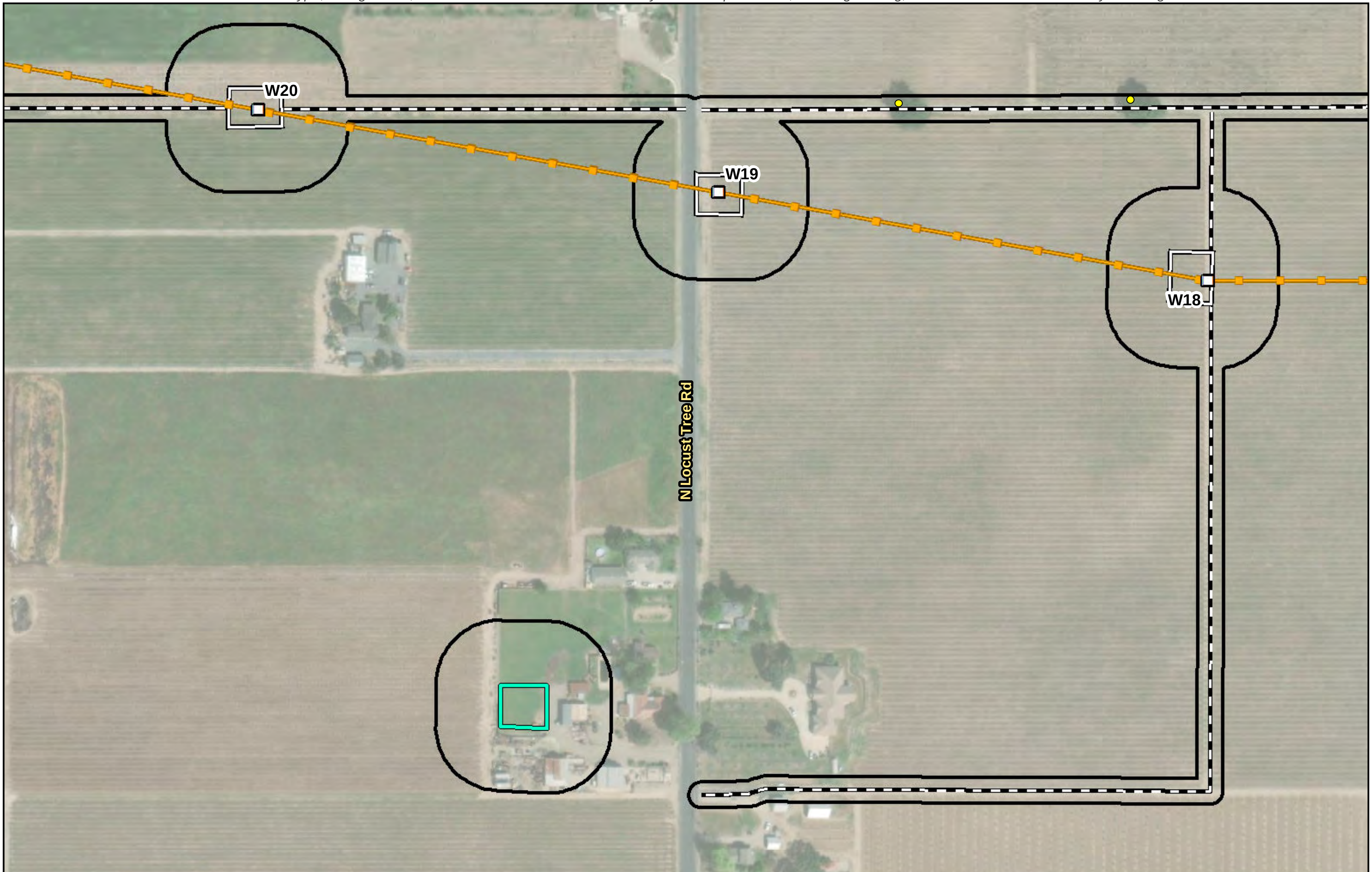

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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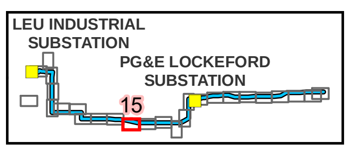

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 15 of 26
Northern San Joaquin 230 kV Transmission Project

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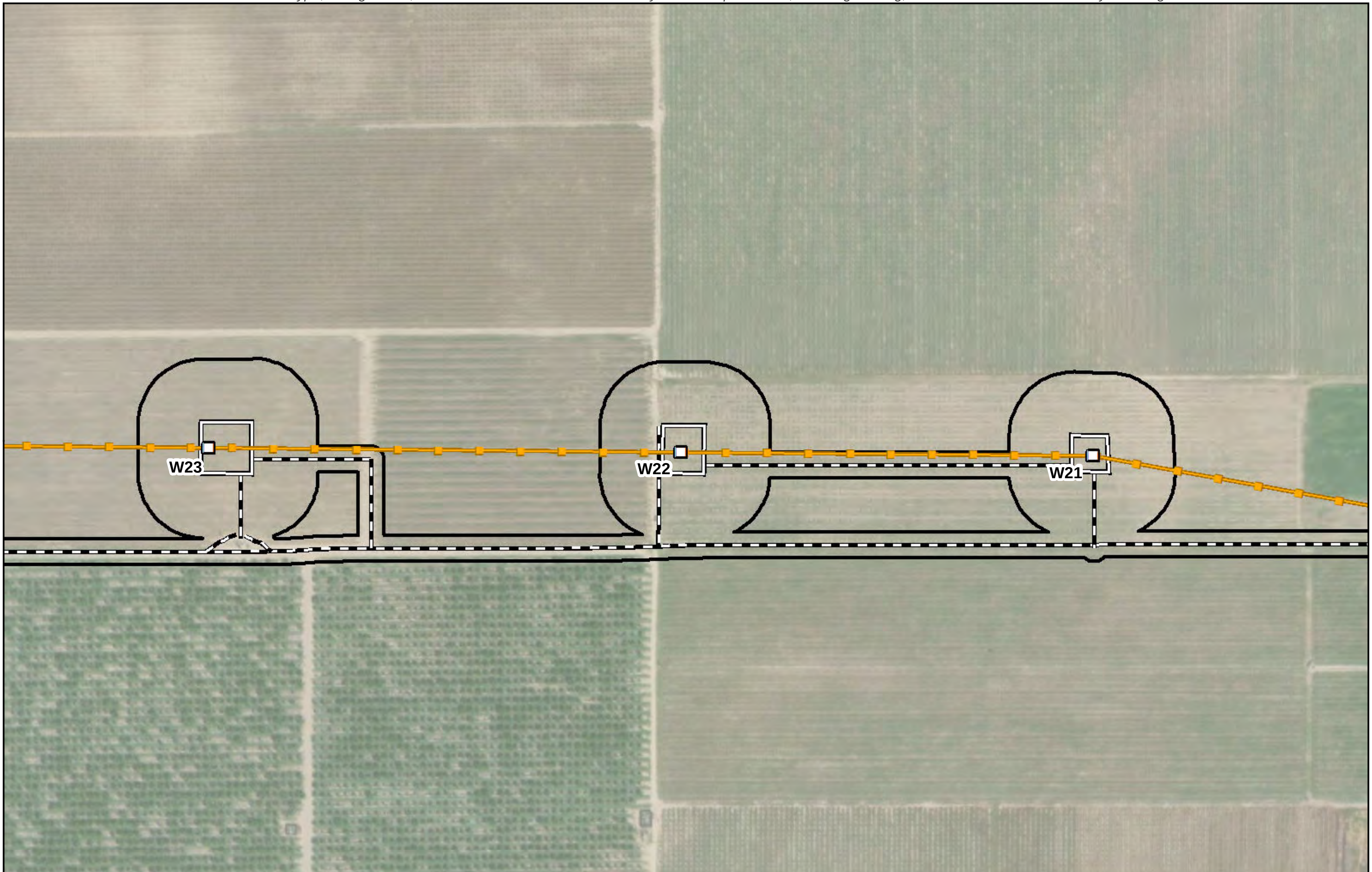

Legend

- Biological Study Area (387.06 acres)
- Substation
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- Existing 230 kV Transmission Line

Proposed Impact Areas

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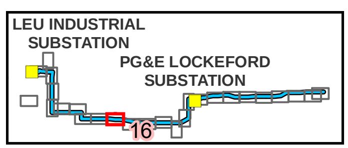

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 16 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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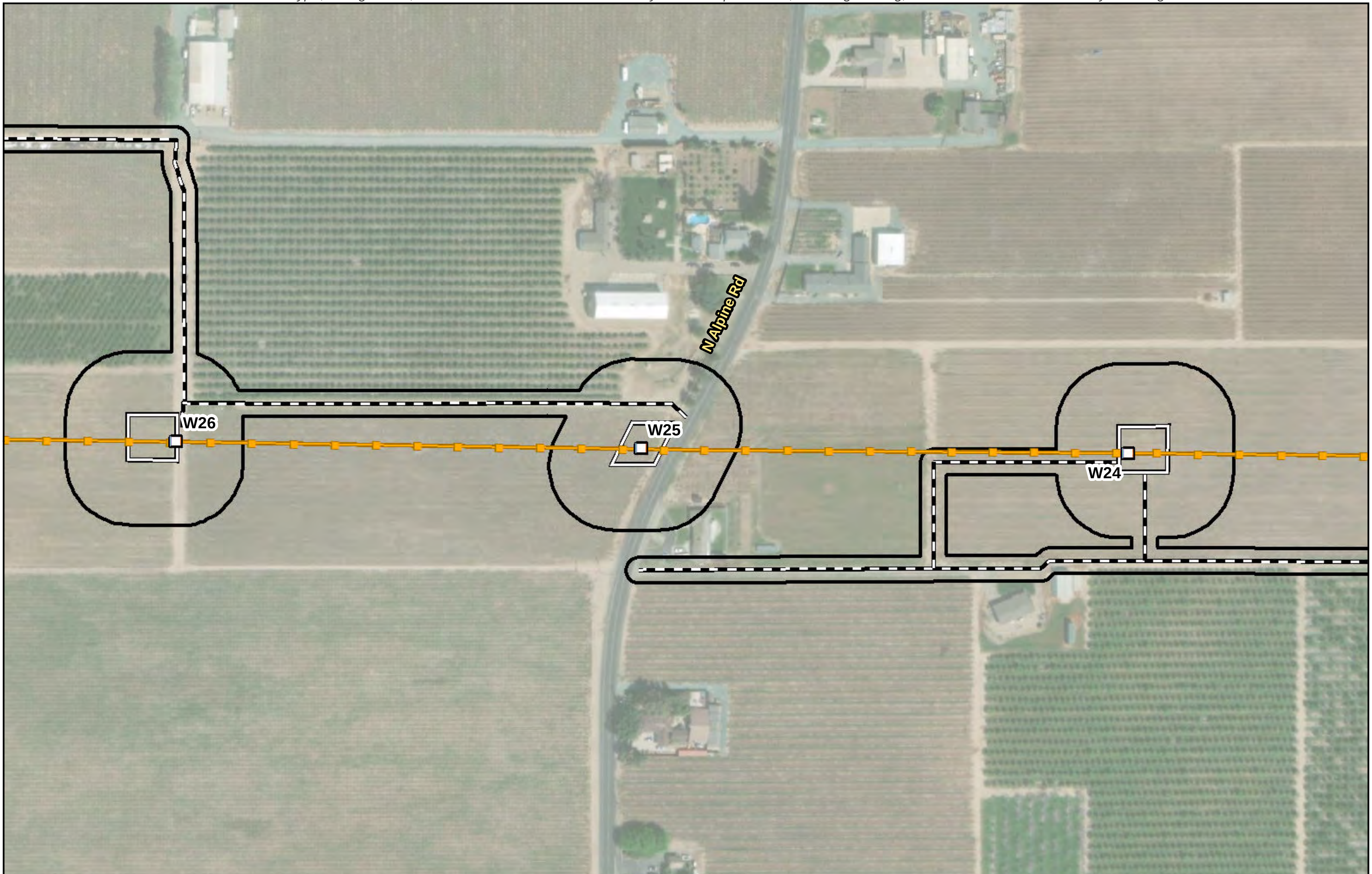

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
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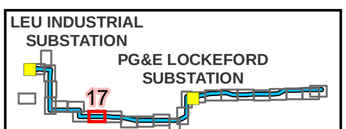

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 17 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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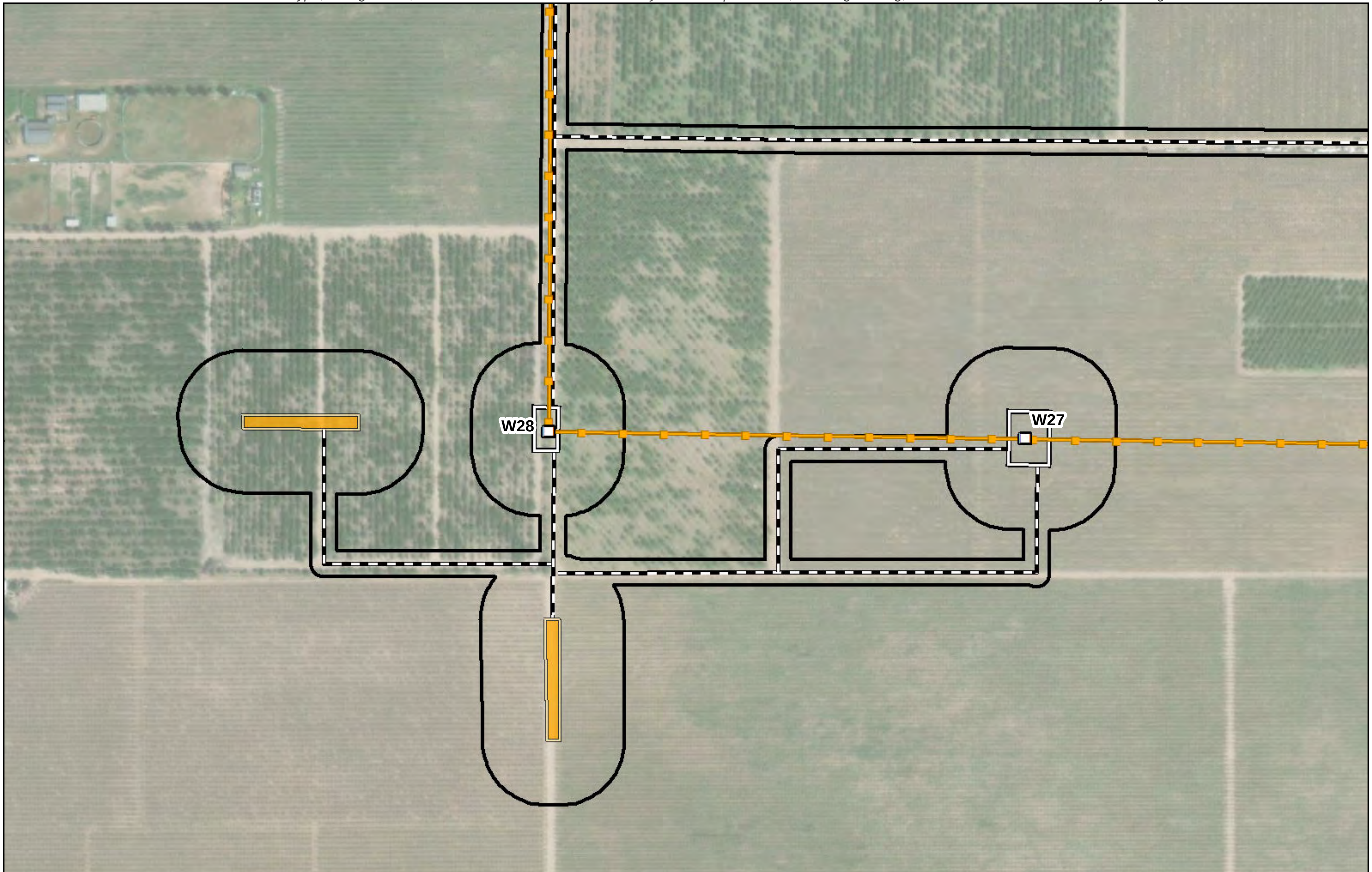

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

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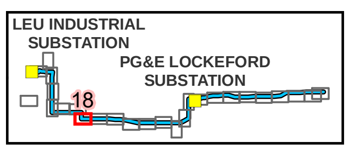

Source:
1) Esri World Imagery

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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 18 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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Preliminary design and engineering for the physical, civil, and outdoor components.
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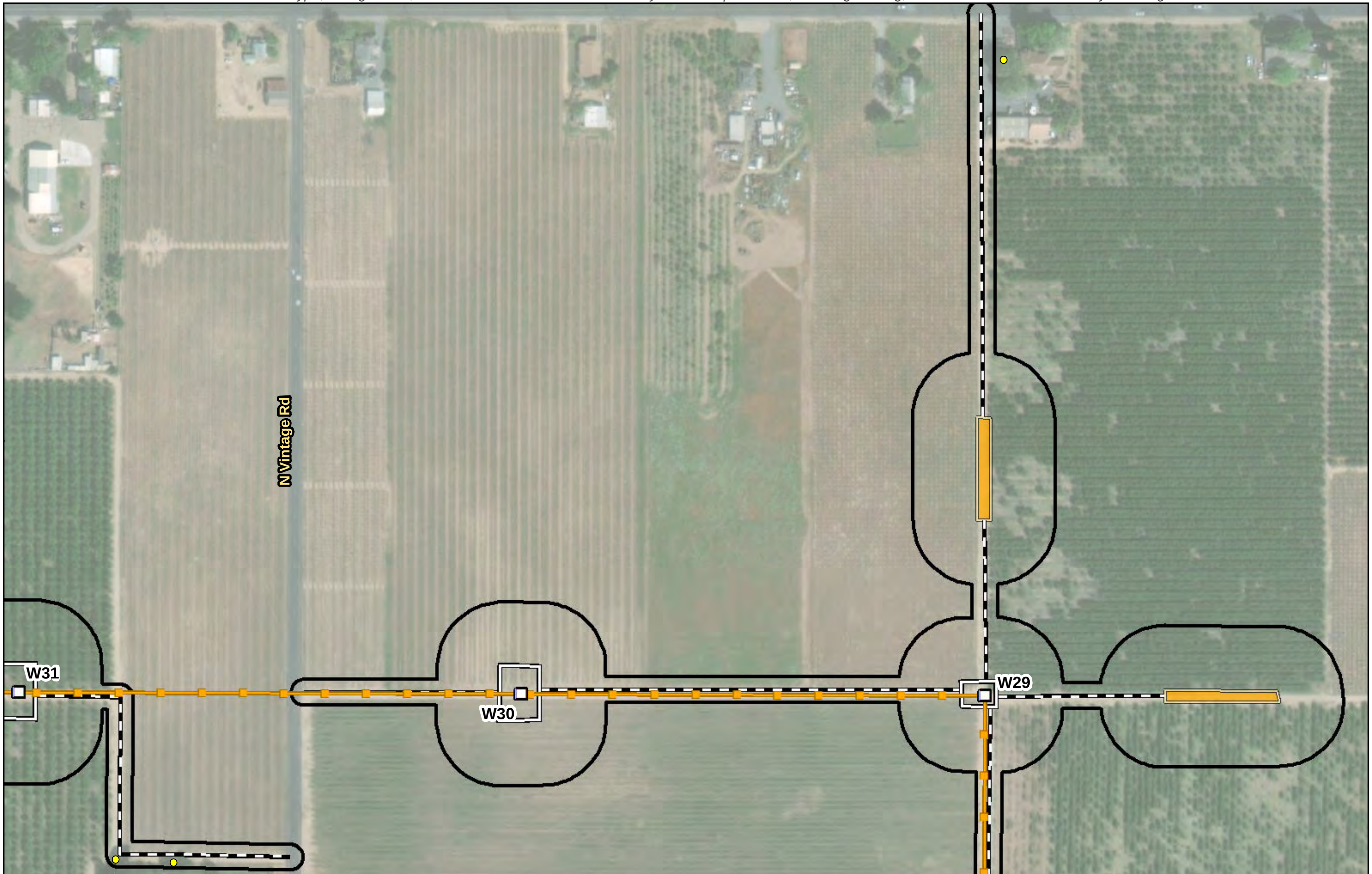

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

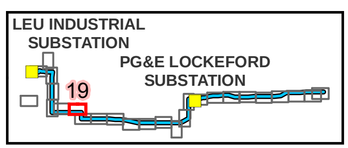

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FIGURE 2
Project Elements and Biological Study Area
Page 19 of 26
Northern San Joaquin 230 kV Transmission Project

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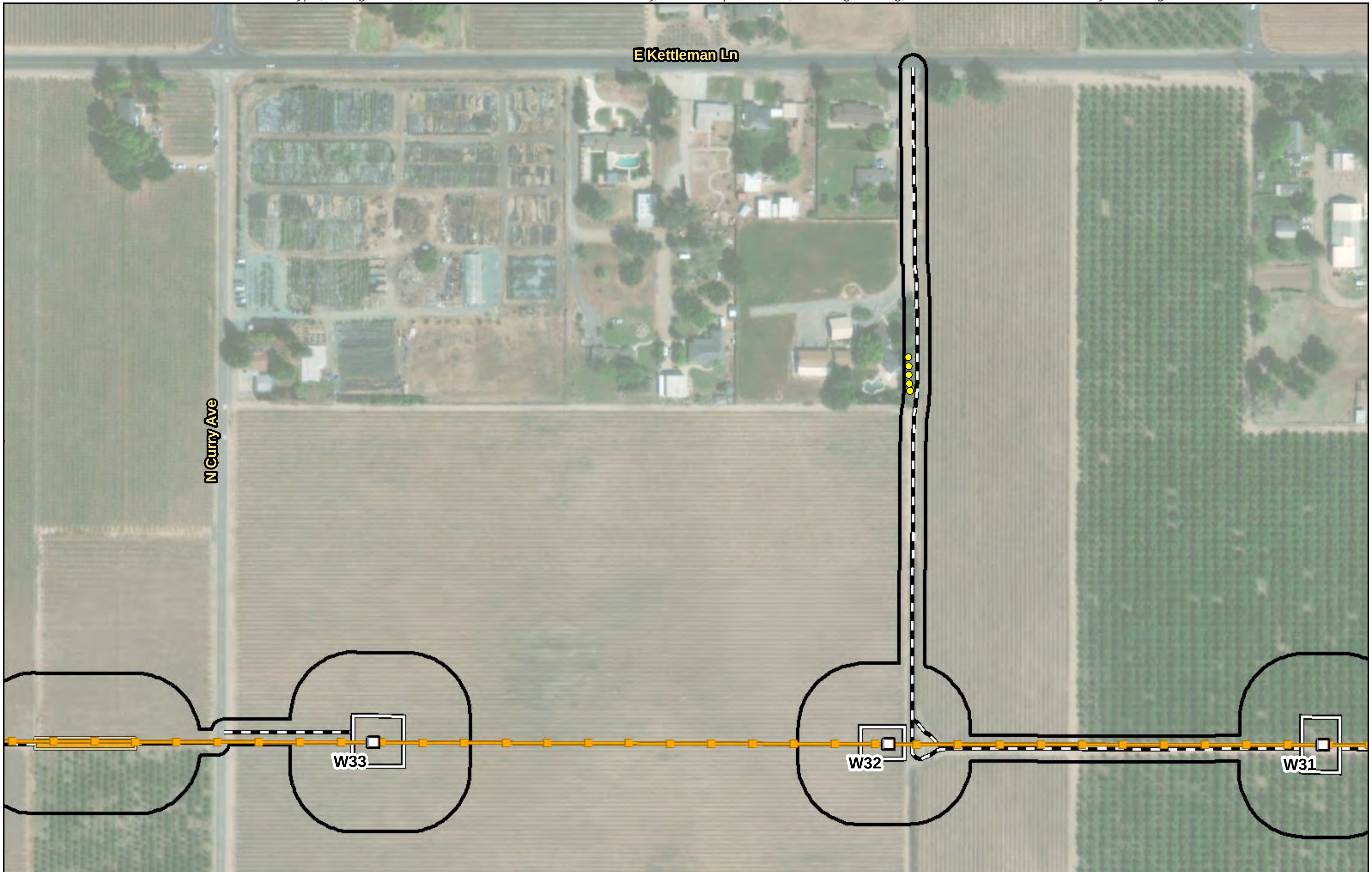

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

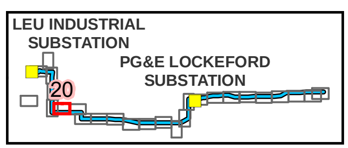

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FIGURE 2
Project Elements and Biological Study Area
Page 20 of 26
Northern San Joaquin 230 kV Transmission Project

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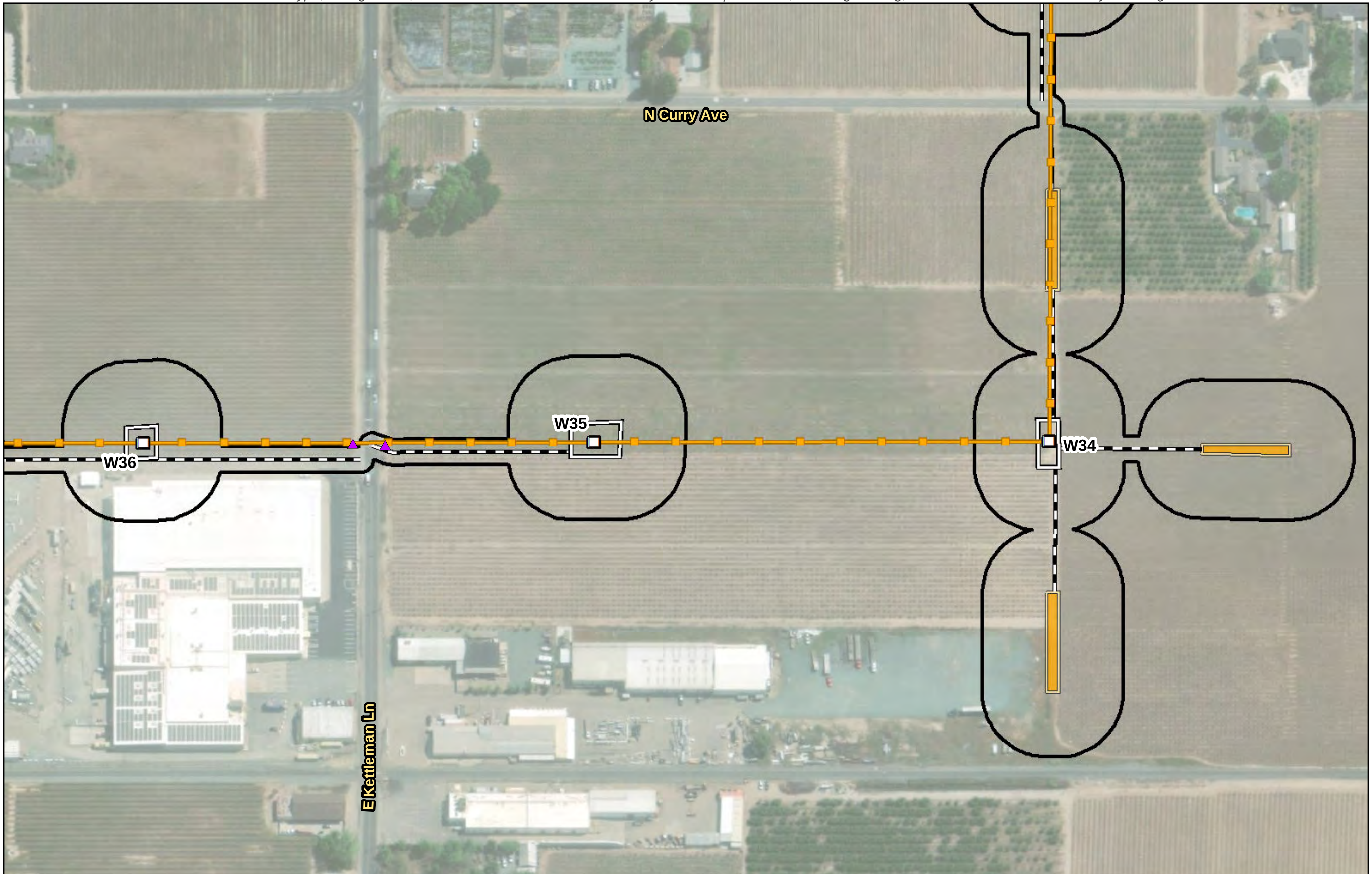

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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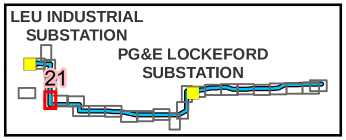
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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FIGURE 2
Project Elements and Biological Study Area
Page 21 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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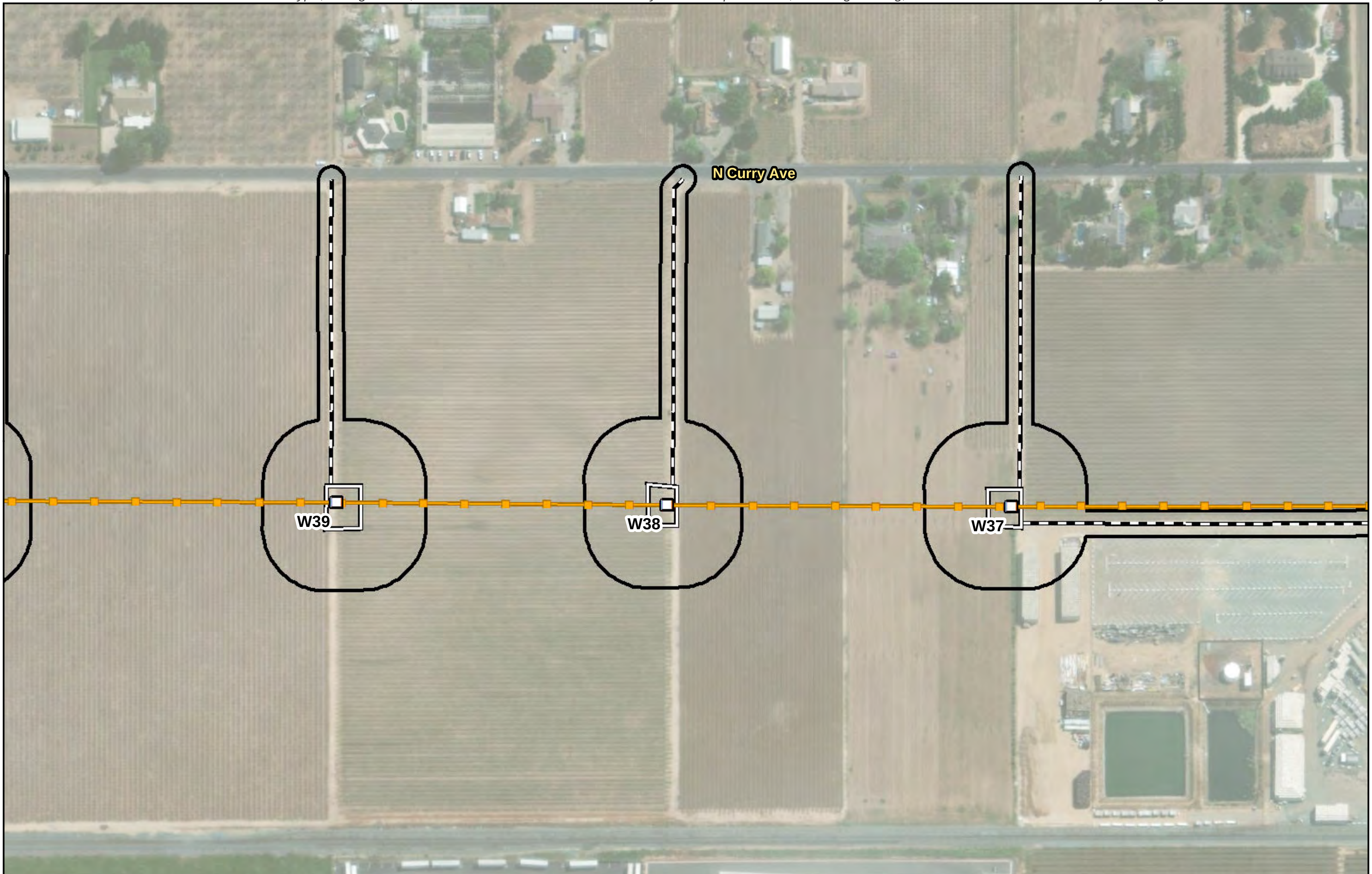

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
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- Proposed Staging Area

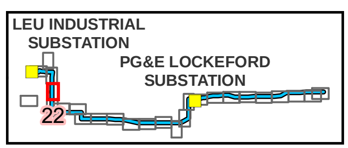

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FIGURE 2
Project Elements and Biological Study Area
Page 22 of 26
Northern San Joaquin 230 kV Transmission Project

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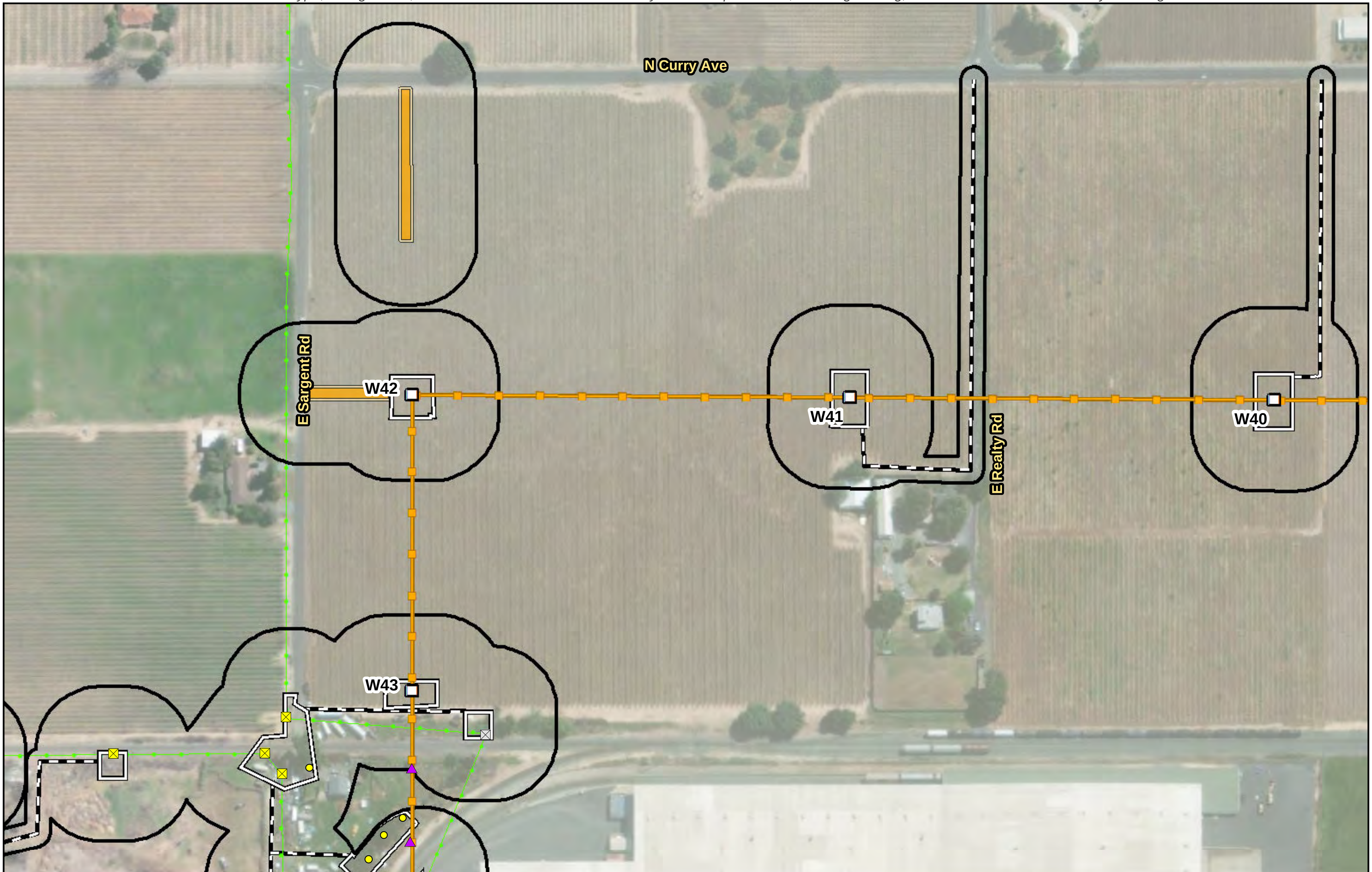

Legend

Biological Study Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal

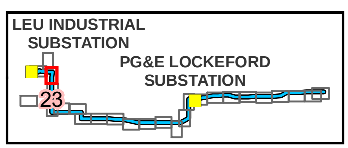

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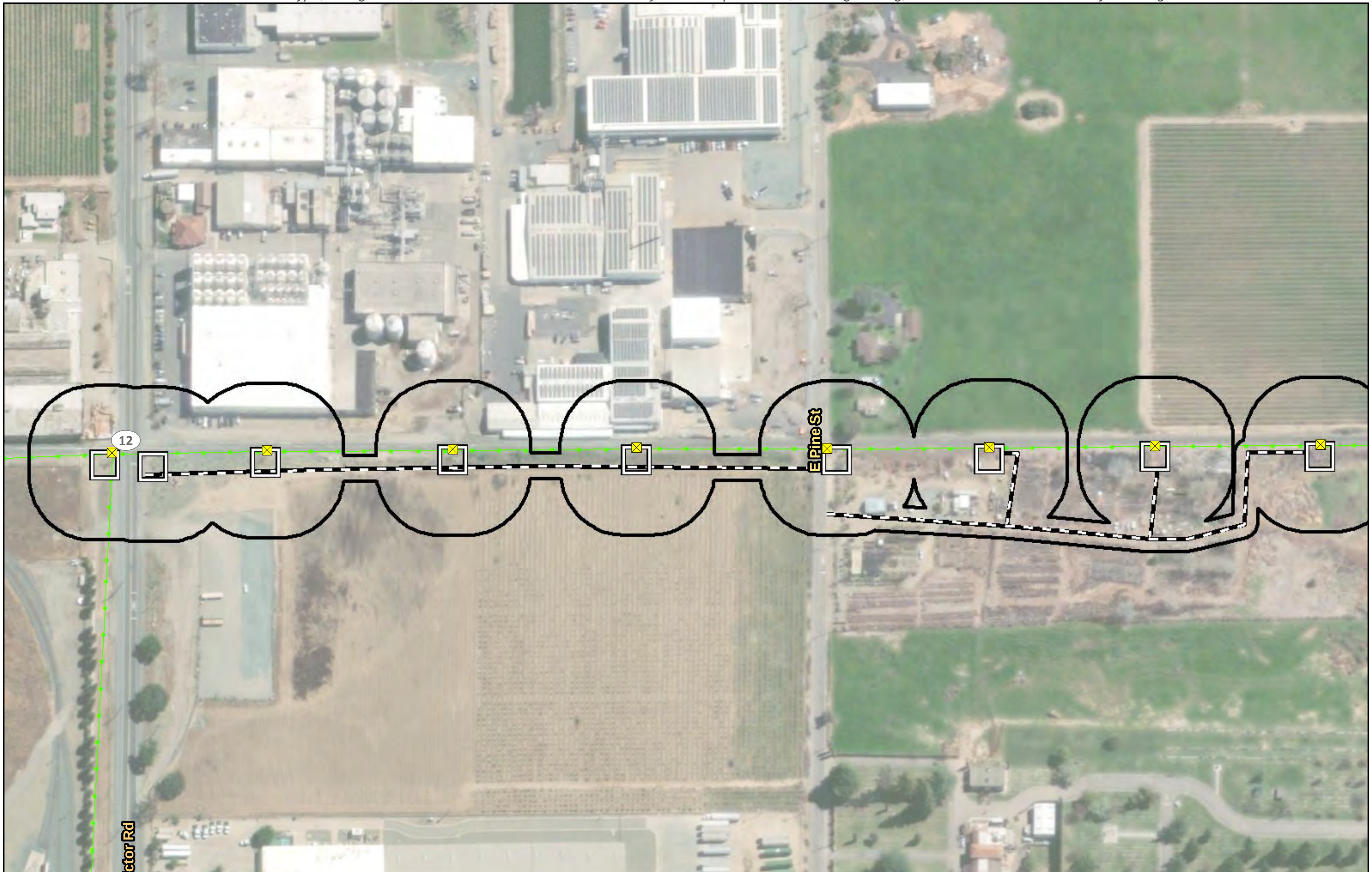
FIGURE 2
Project Elements and Biological Study Area
Page 23 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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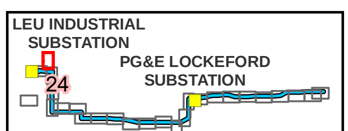
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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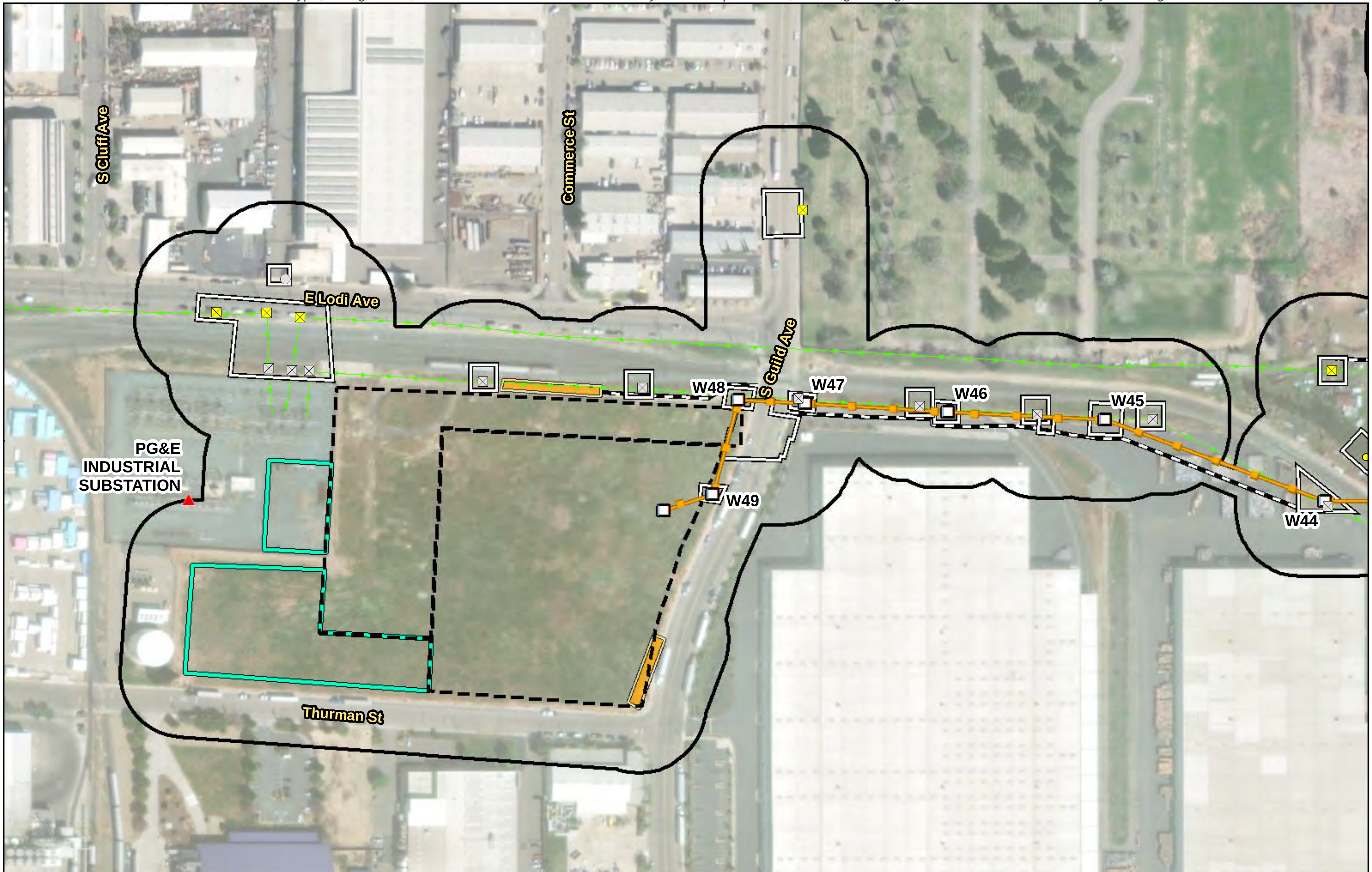
FIGURE 2
Project Elements and Biological Study Area
Page 24 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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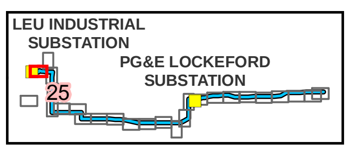
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 25 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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Preliminary design and engineering for the physical, civil, and outdoor components.
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Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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Proposed Impact Areas

- Proposed Structure
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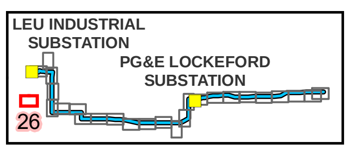
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Study Area
Page 26 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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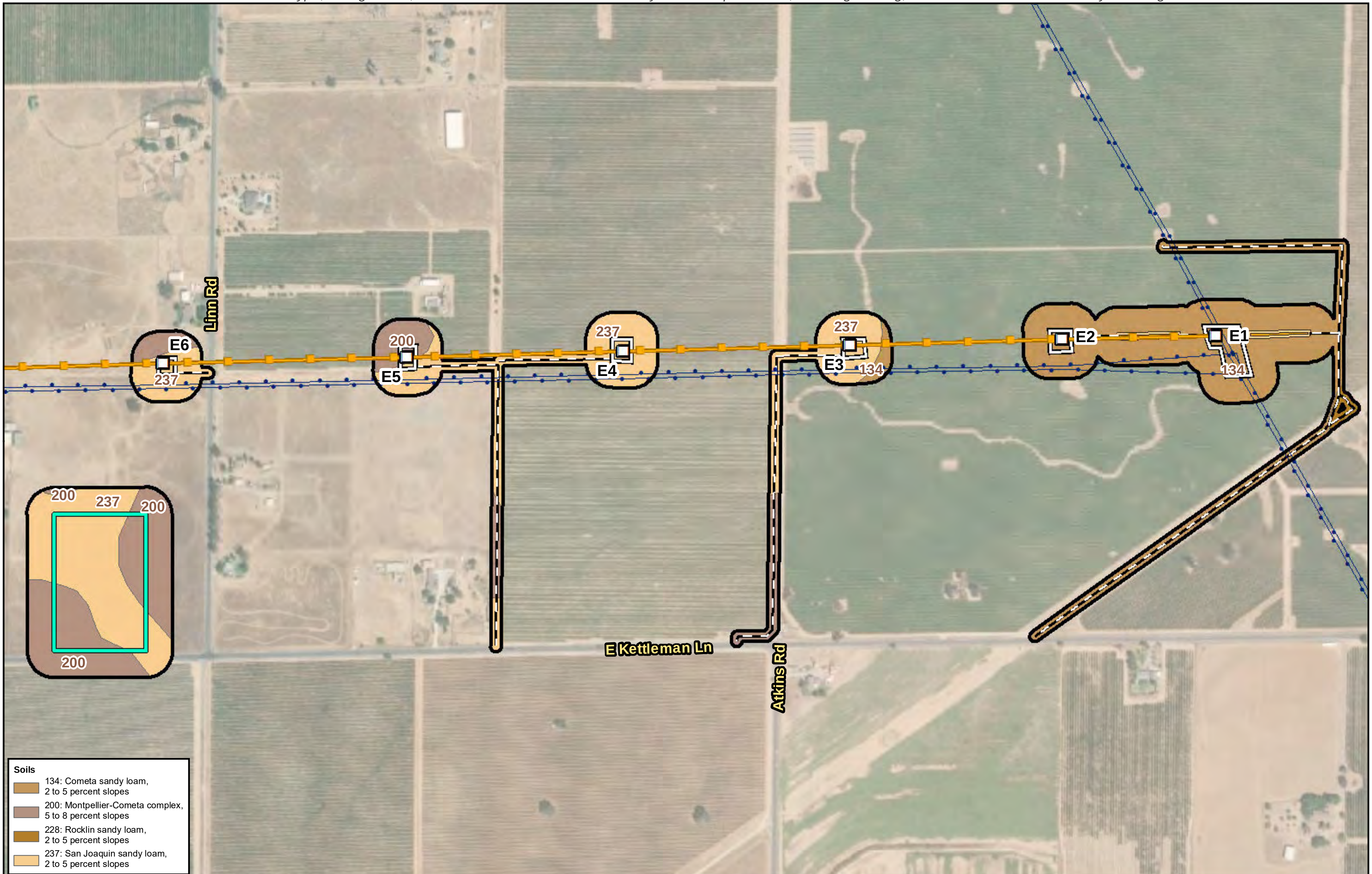

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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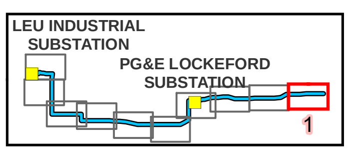

Source:
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FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 1 of 10
Northern San Joaquin 230 kV Transmission Project

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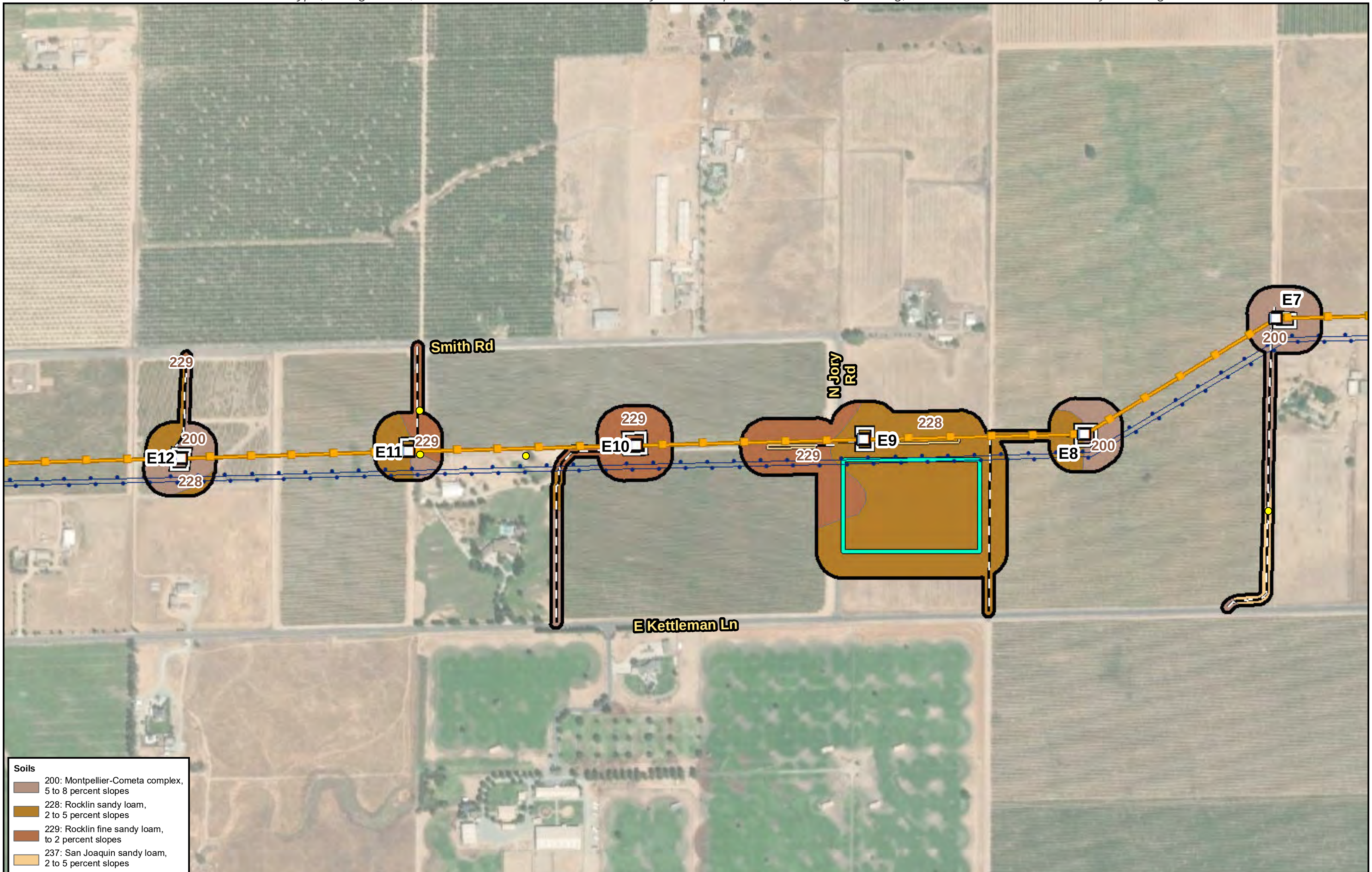

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
2

Source:
1) Esri World Imagery

0 200 Feet

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 2 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_3_230818.mxd kgrant1 8/18/2023

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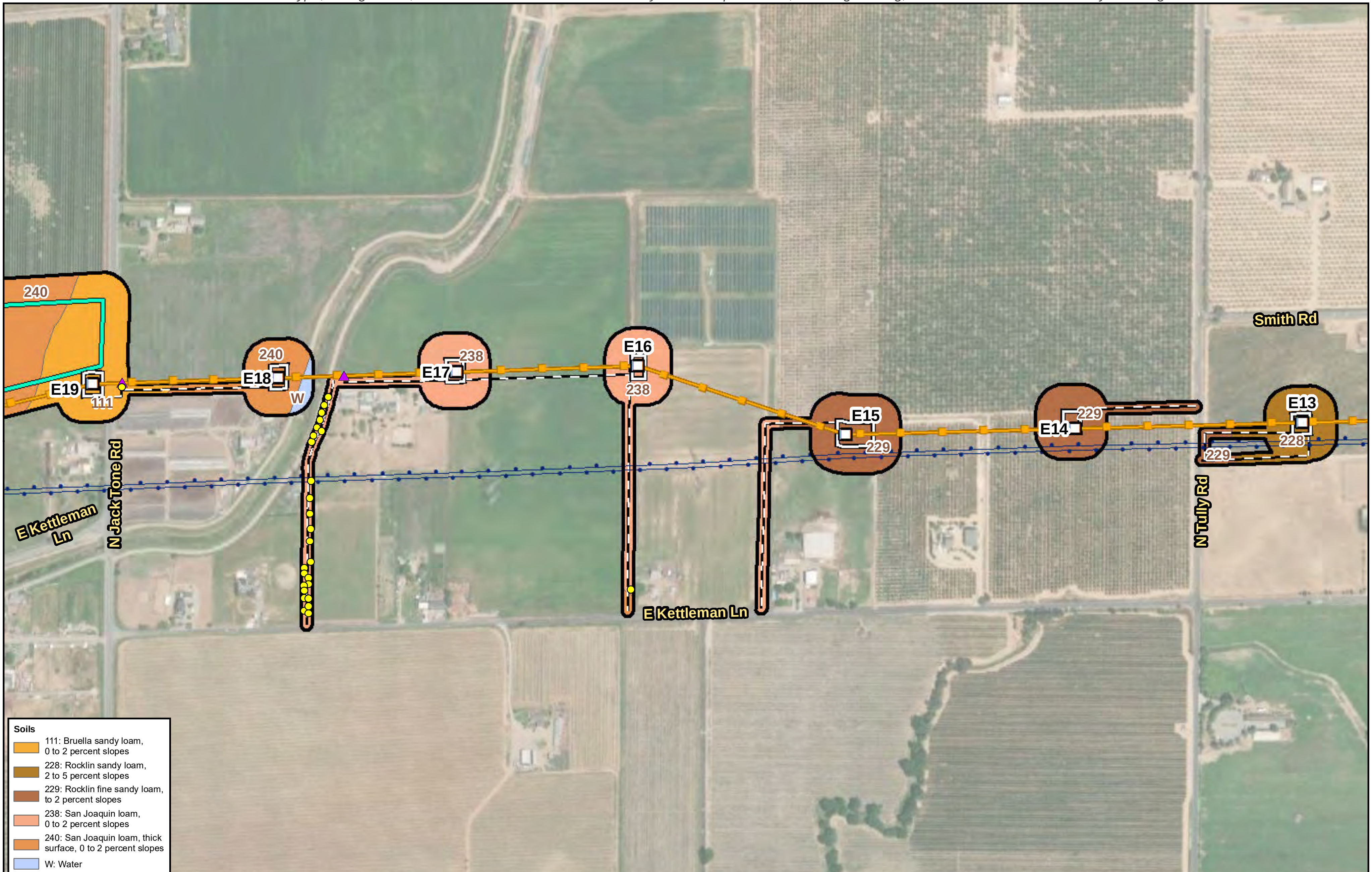

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

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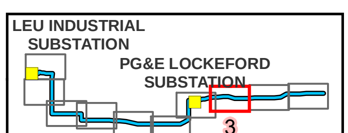

Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 3 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_3_230818.mxd kgrant1 8/18/2023

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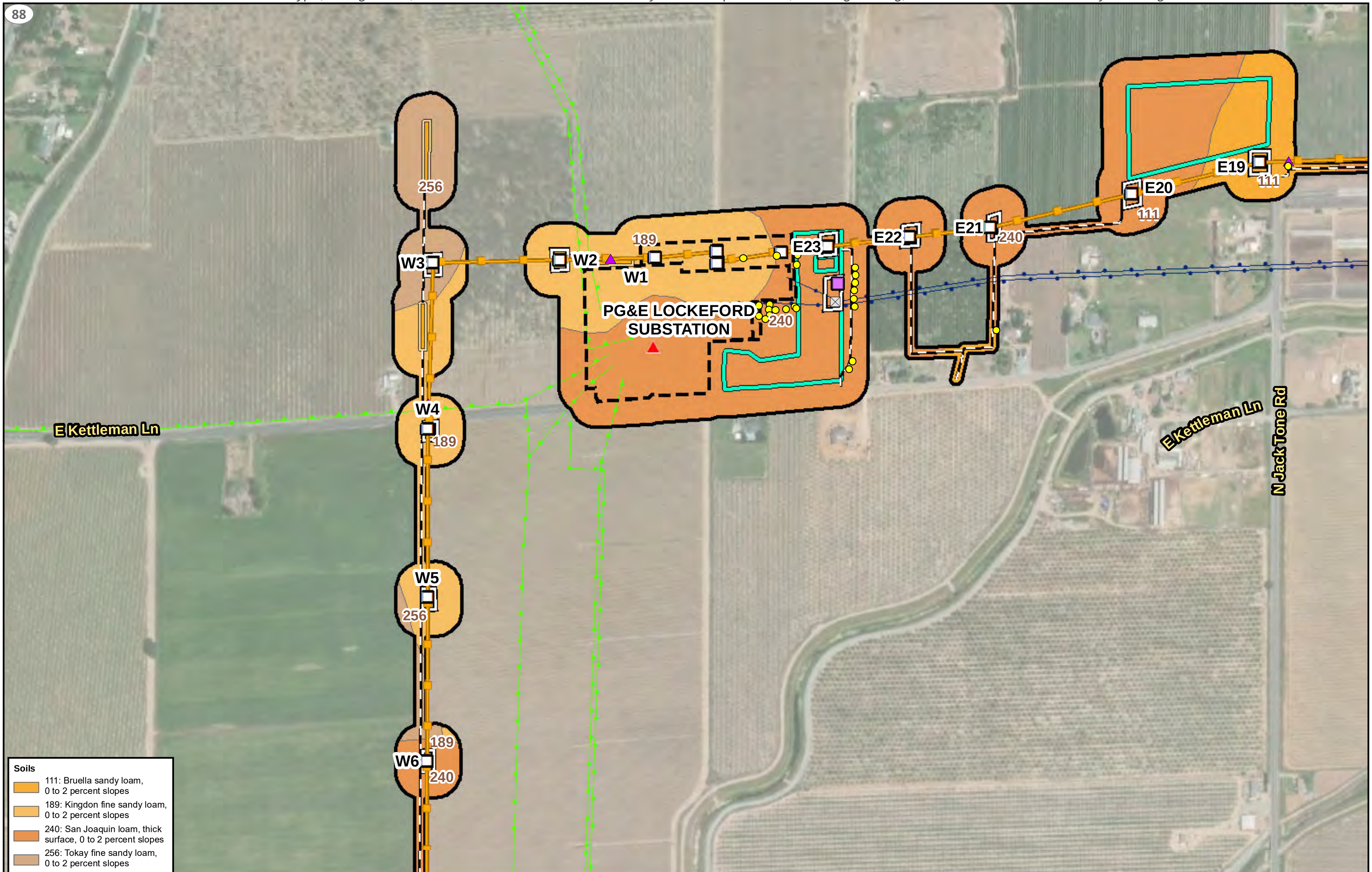

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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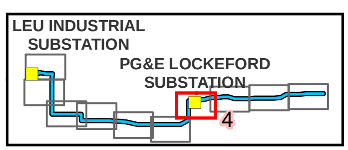

Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 4 of 10
Northern San Joaquin 230 kV Transmission Project

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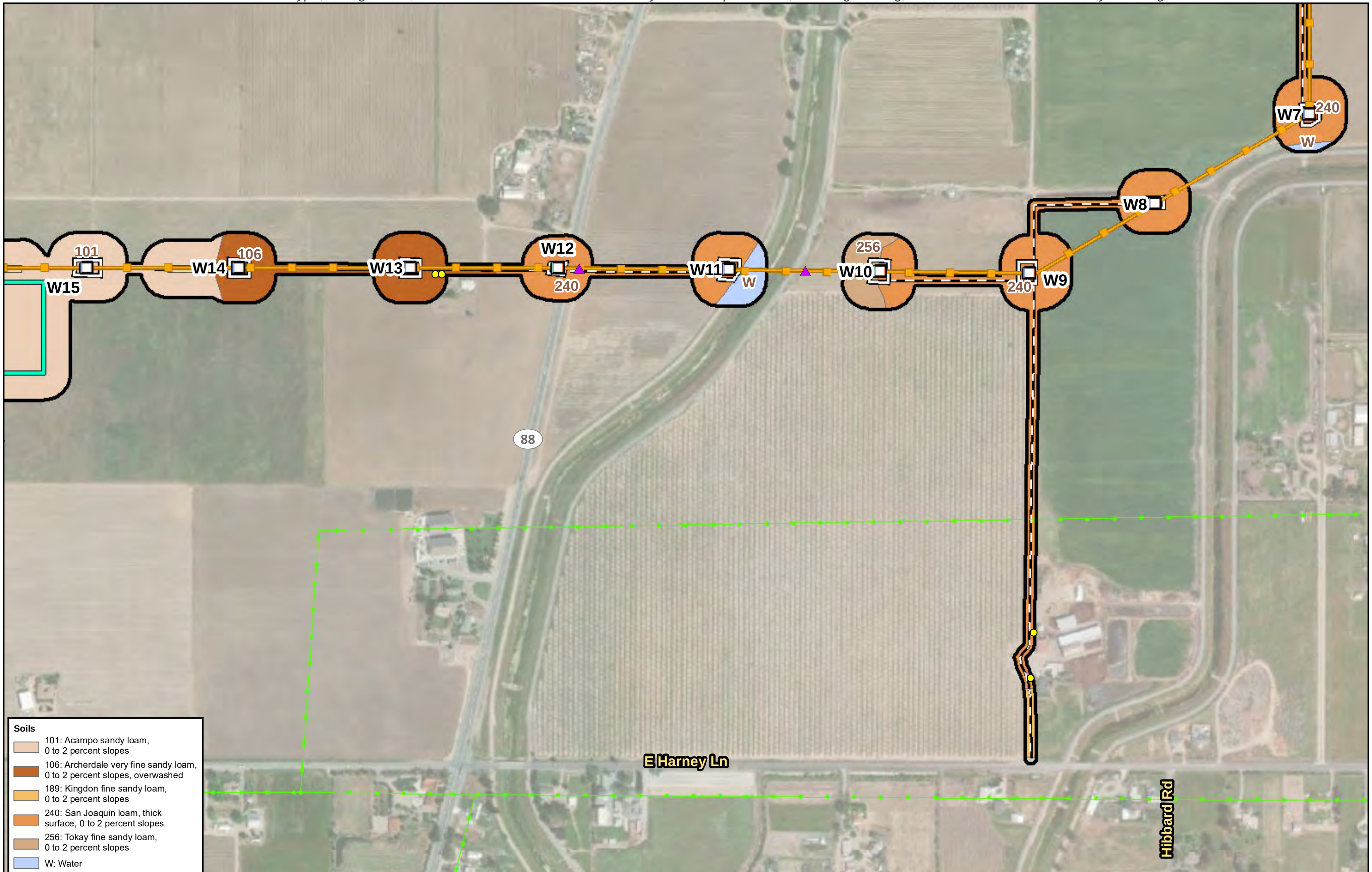

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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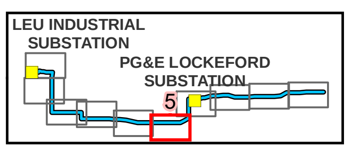

Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 5 of 10
Northern San Joaquin 230 kV Transmission Project

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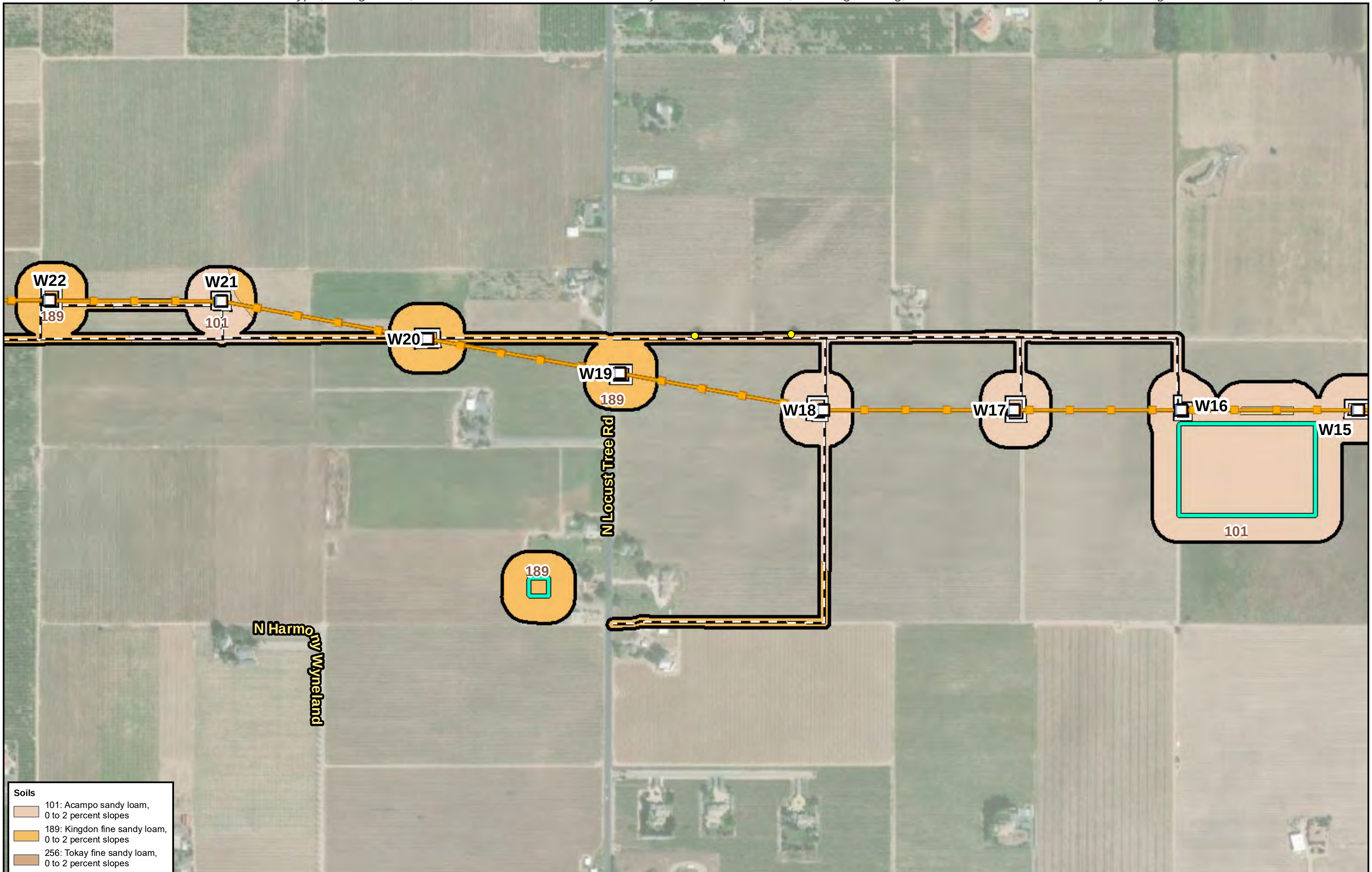

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
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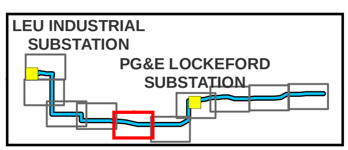

Source:
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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 6 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

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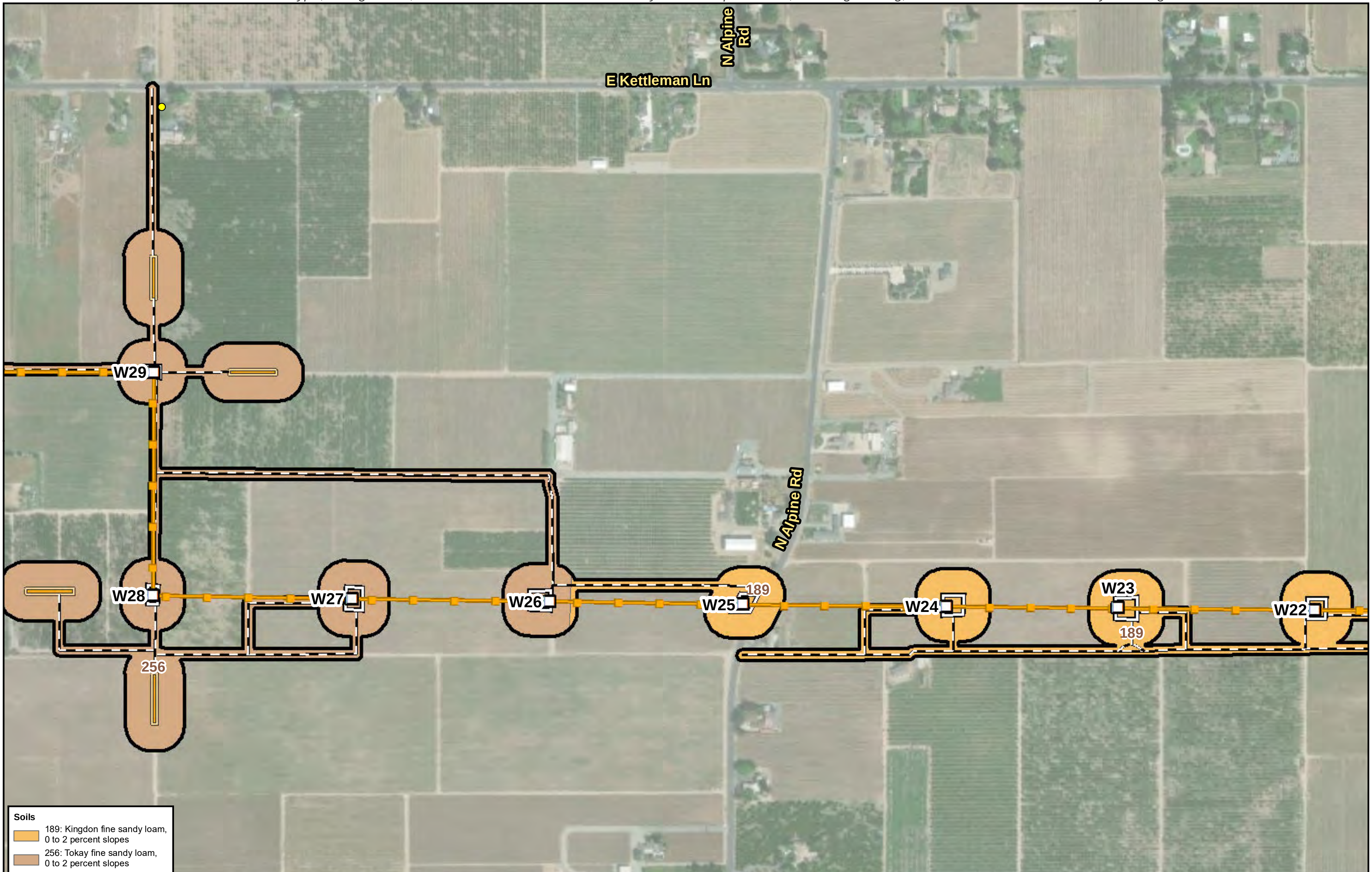

Legend

- Biological Study Area (387.06 acres)
- Substation
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- Existing 60 kV Power Line
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Proposed Impact Areas

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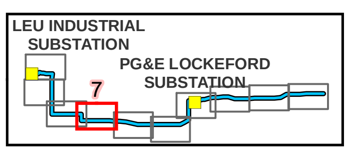
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 7 of 10
Northern San Joaquin 230 kV Transmission Project

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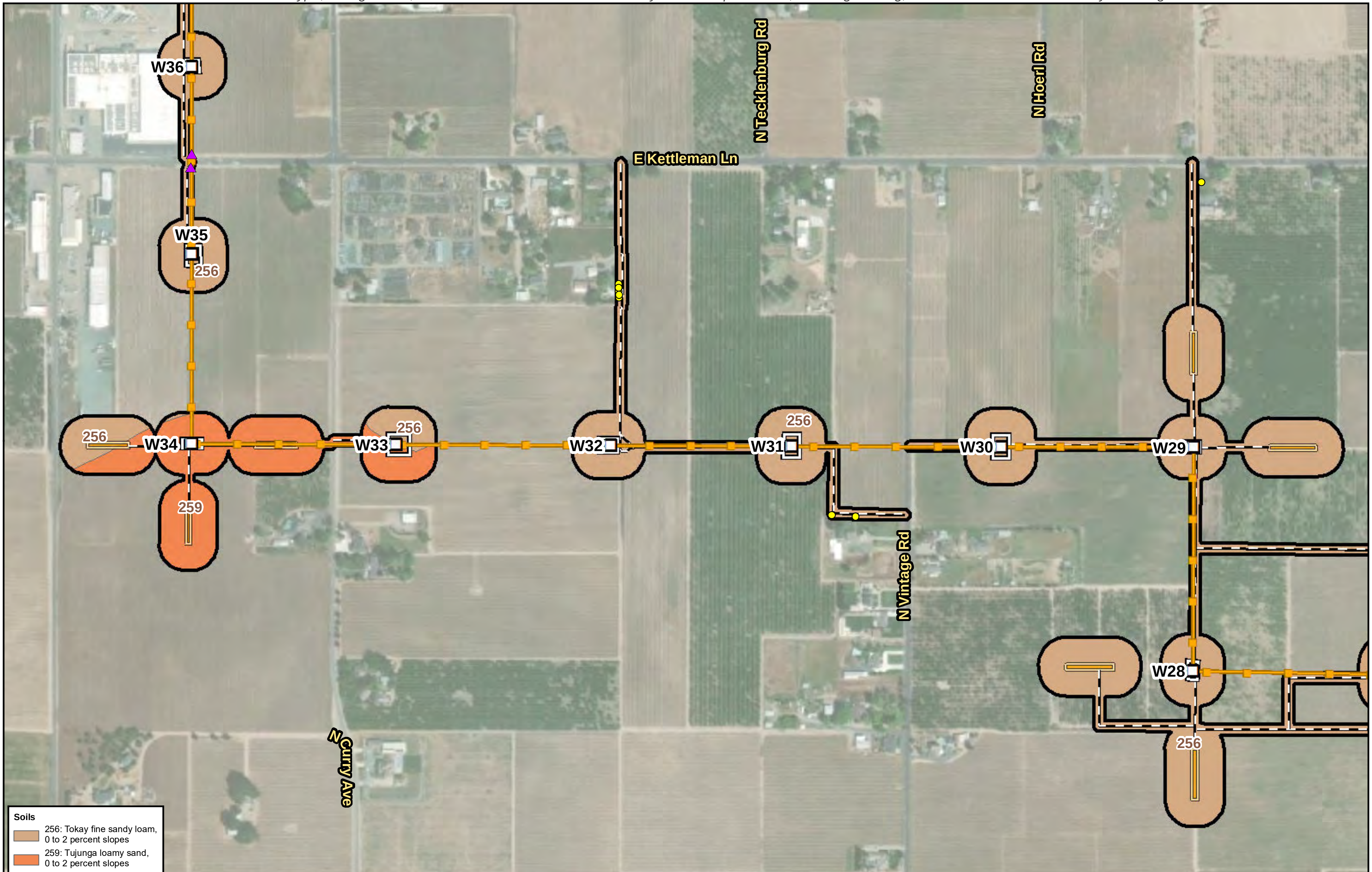

Legend

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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
8

Source:
1) Esri World Imagery

N

0 200 Feet

Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 8 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

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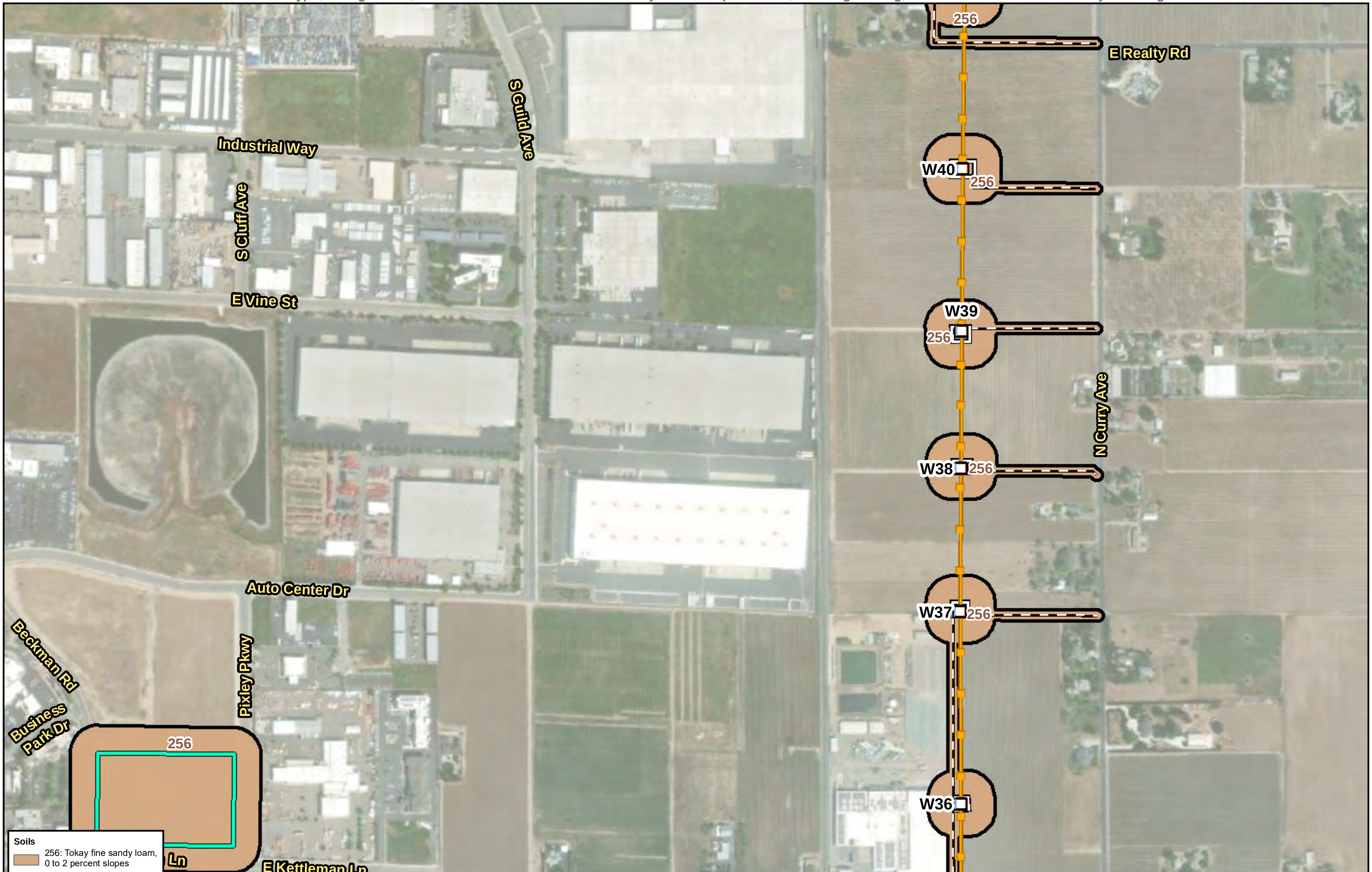

Legend
- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas
- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
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- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

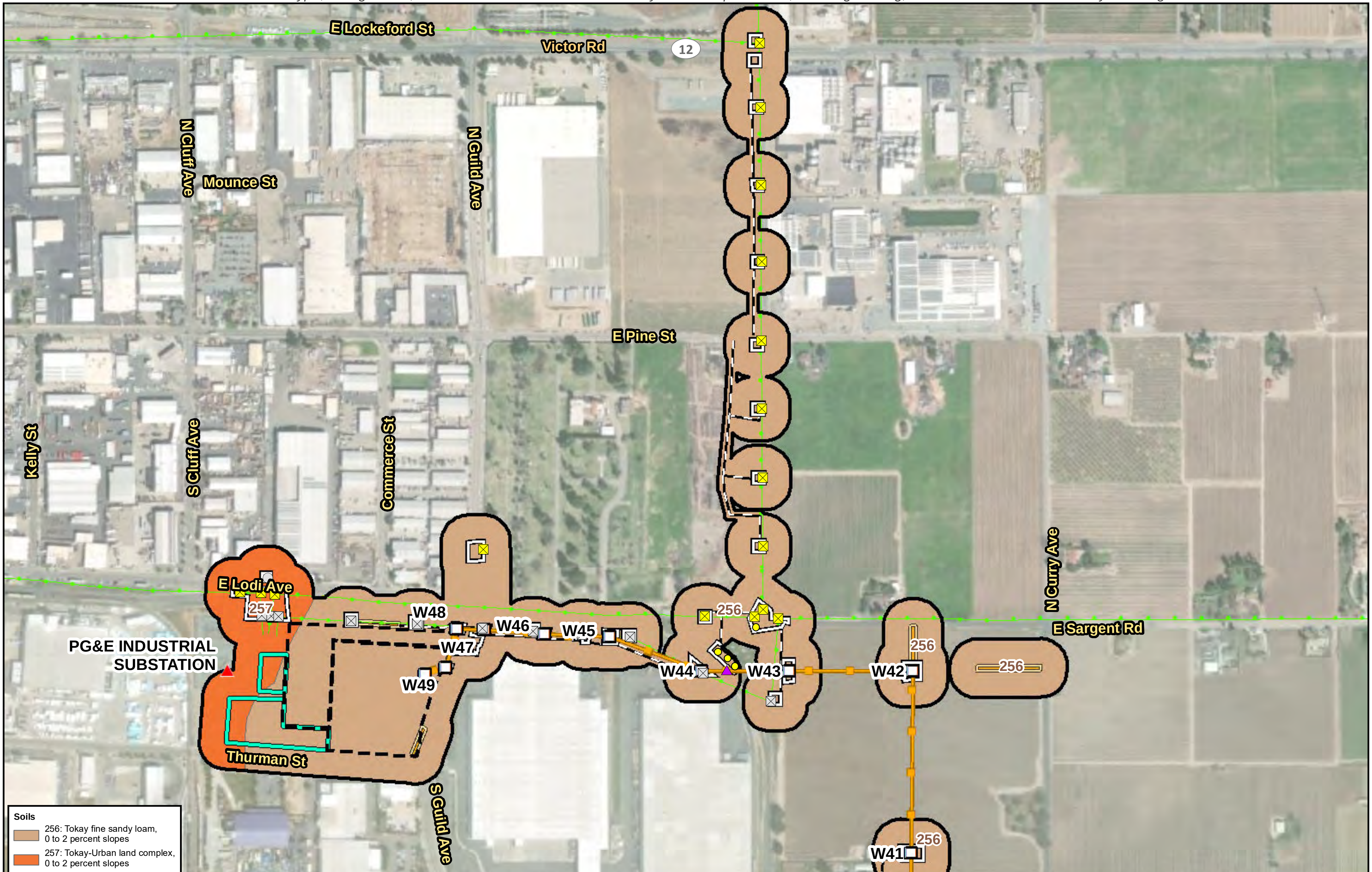
LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
9

Source:
1) Esri World Imagery

N
0 200 Feet
Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 9 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E



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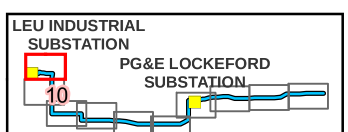

Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
NRCS Soil Series within the Biological Study Area
Page 10 of 10
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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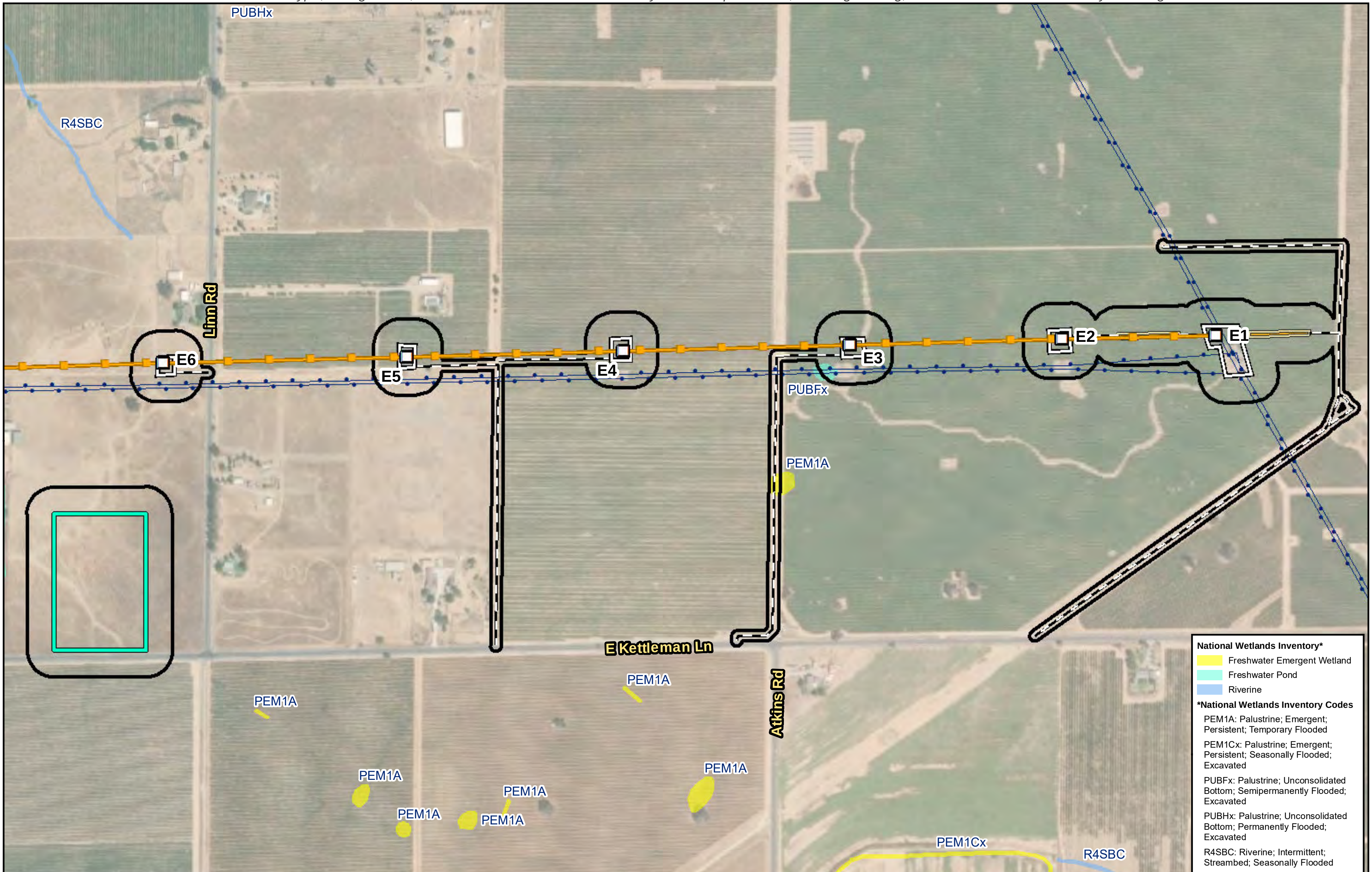

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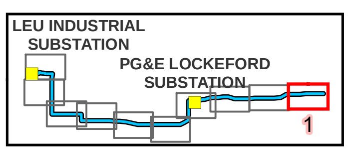

Source:
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Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 1 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

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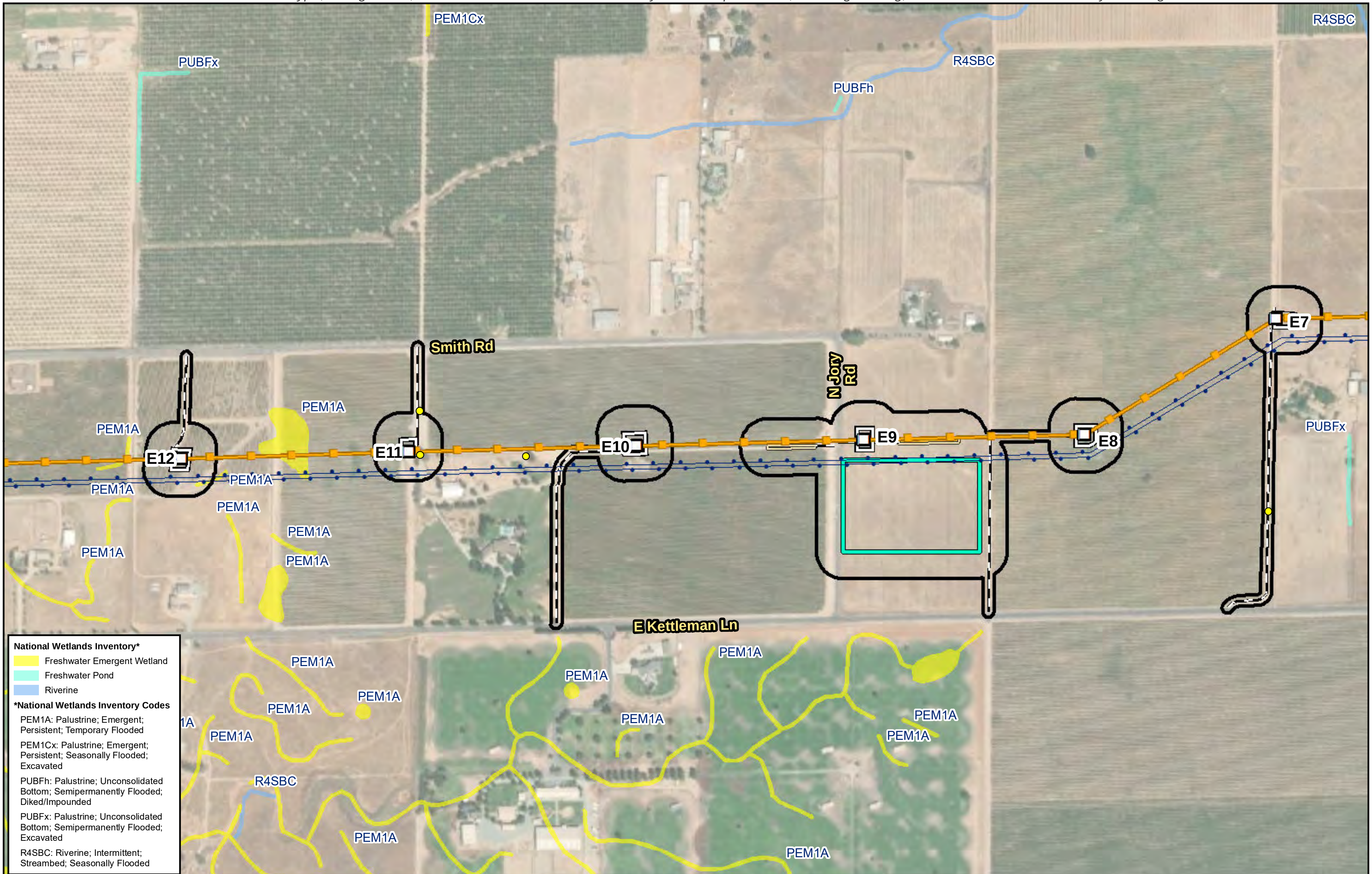

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LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
2

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 2 of 10
Northern San Joaquin 230 kV Transmission Project

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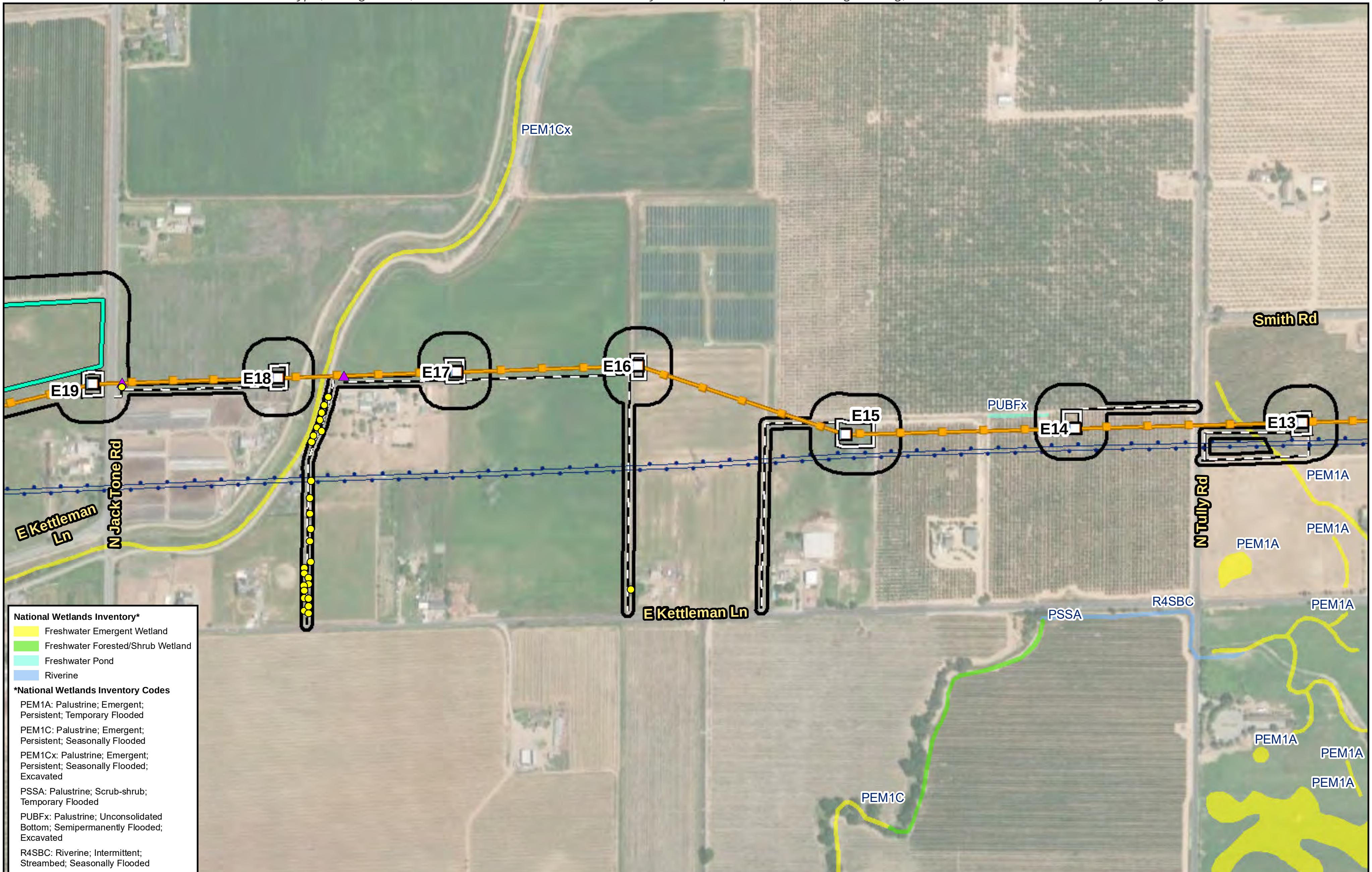

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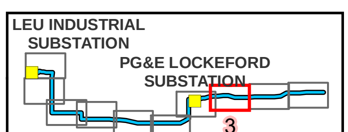

Source:
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0 200 Feet

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Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 3 of 10
Northern San Joaquin 230 kV Transmission Project

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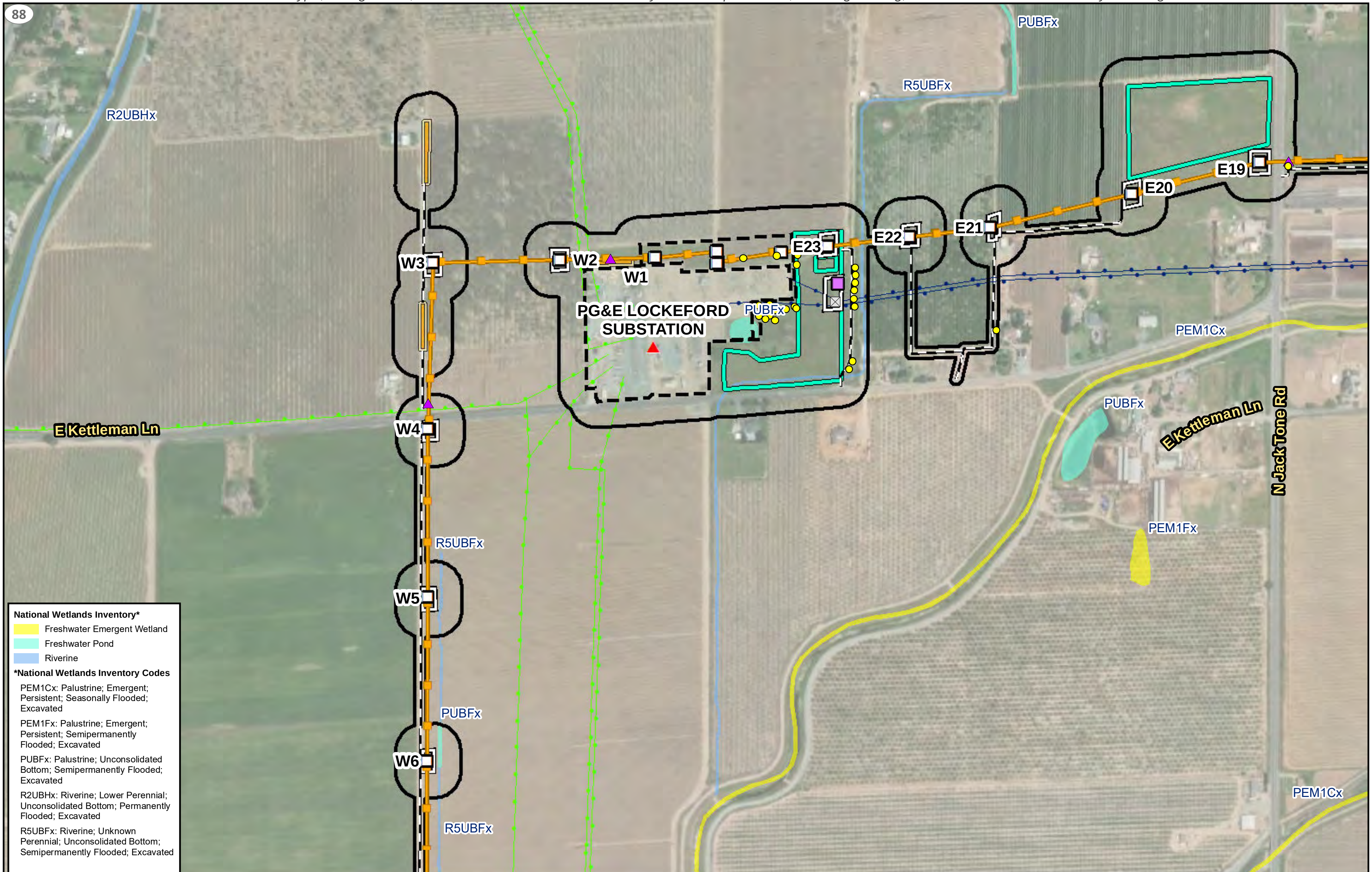

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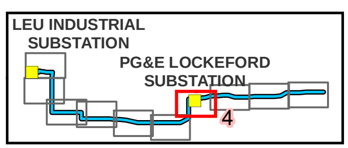

Source:
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Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 4 of 10
Northern San Joaquin 230 kV Transmission Project

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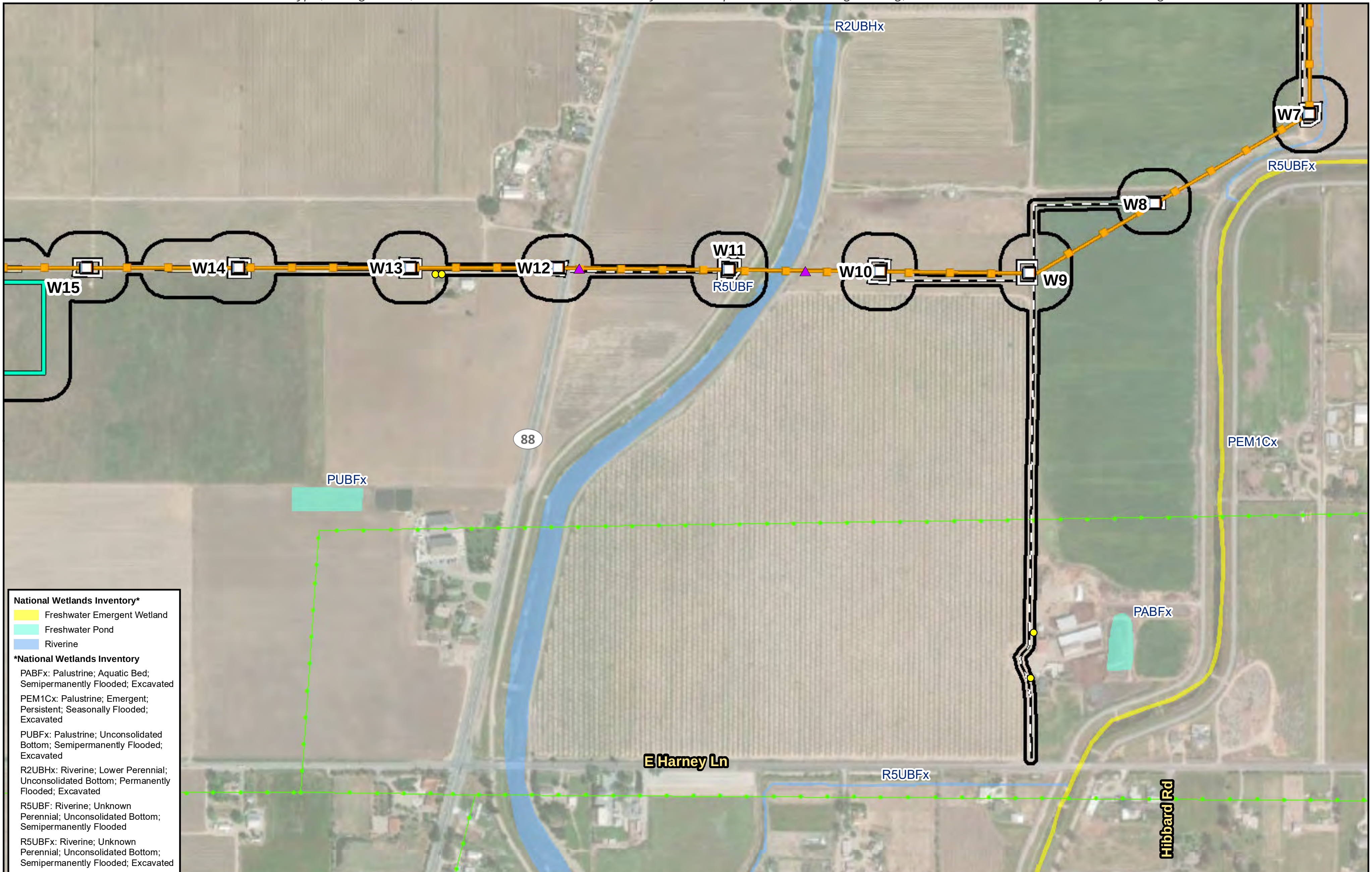

Legend

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Proposed Staging Area
Potential Tree Trimming or Removal

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
5

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 5 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

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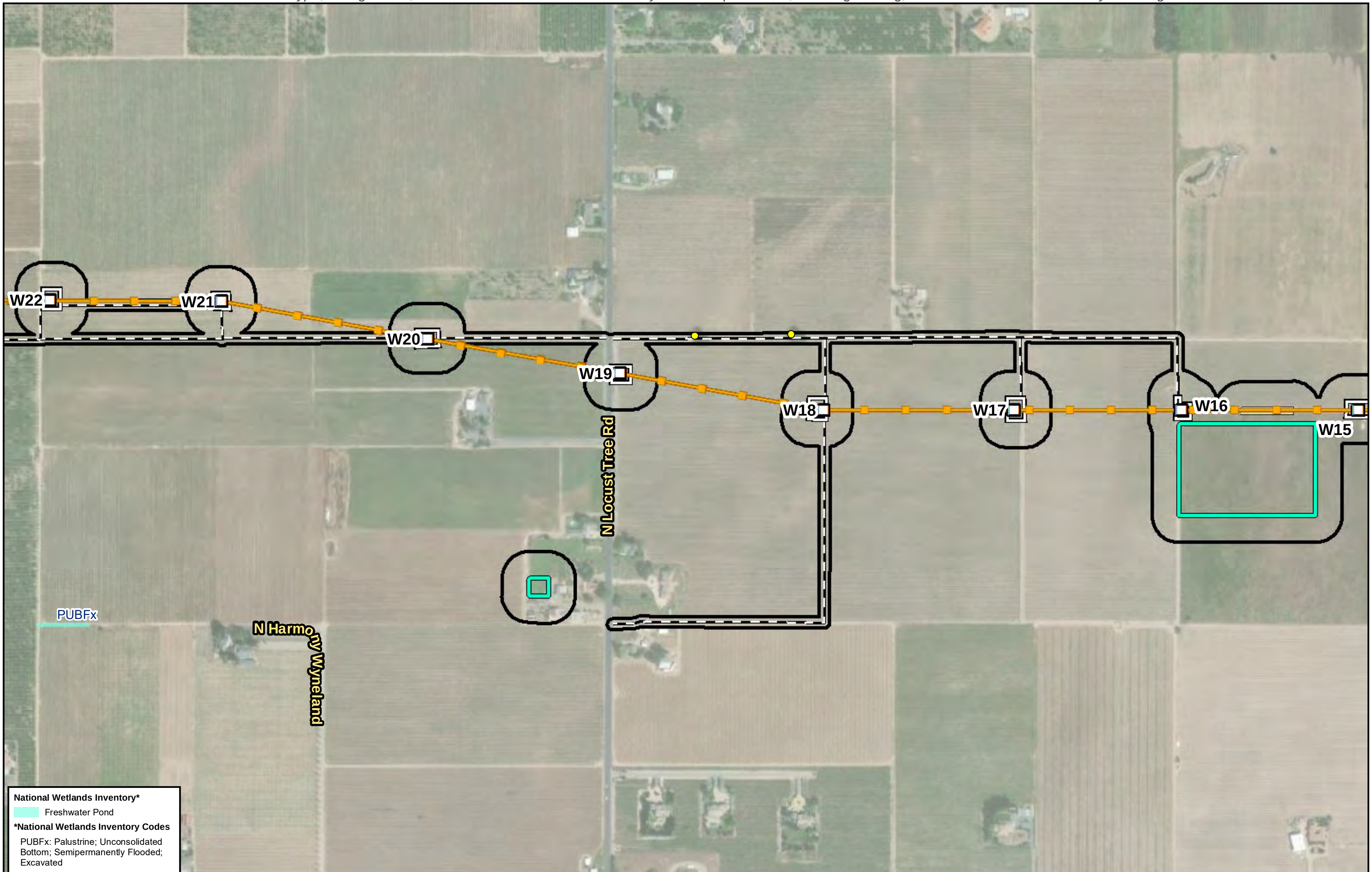

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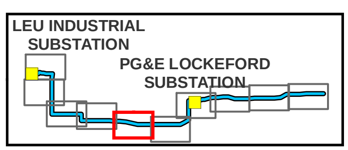

Source:
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0 200 Feet
Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 6 of 10
Northern San Joaquin 230 kV Transmission Project

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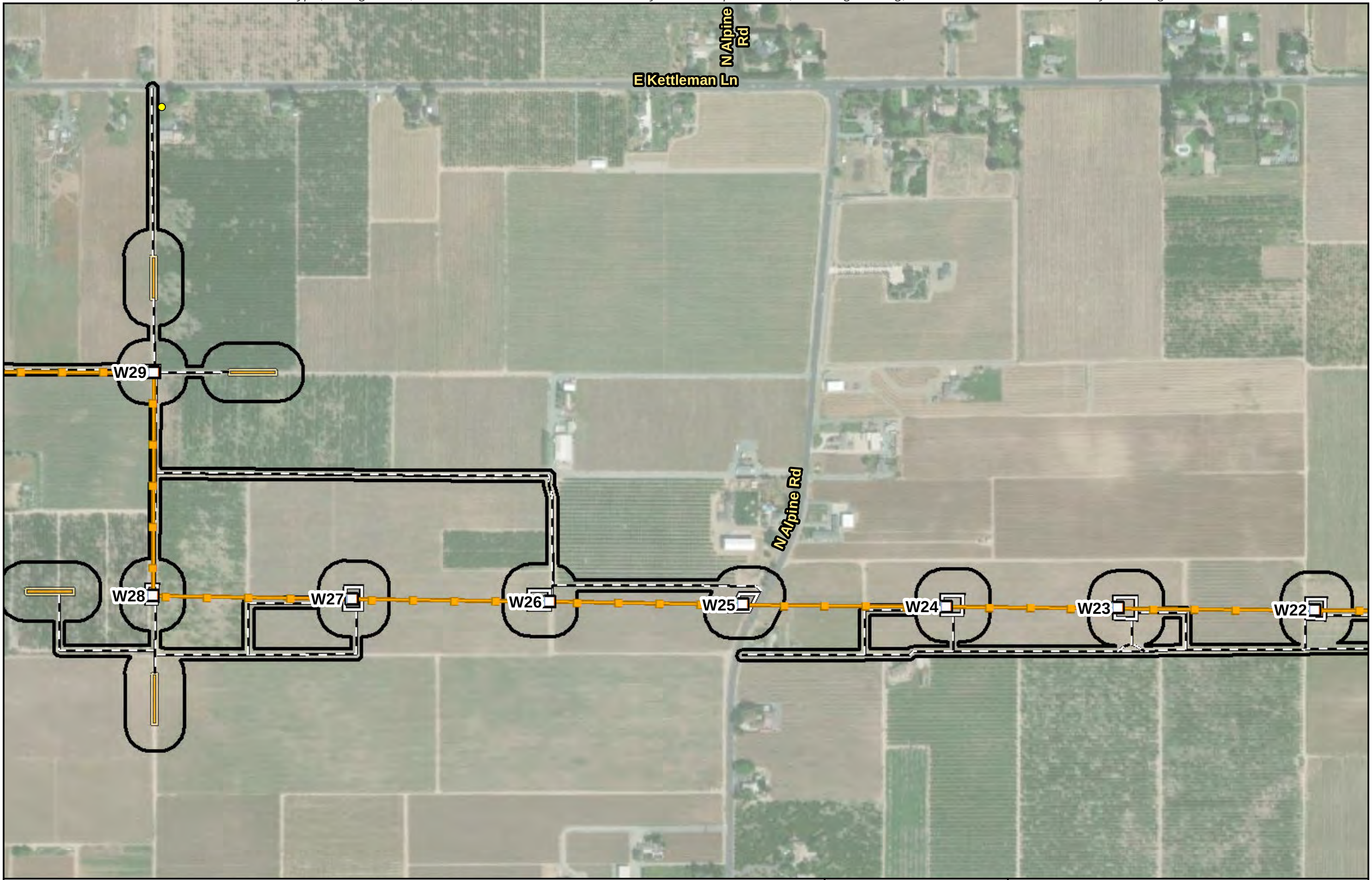

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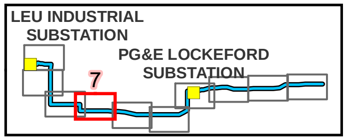

Source:
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Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 7 of 10
Northern San Joaquin 230 kV Transmission Project

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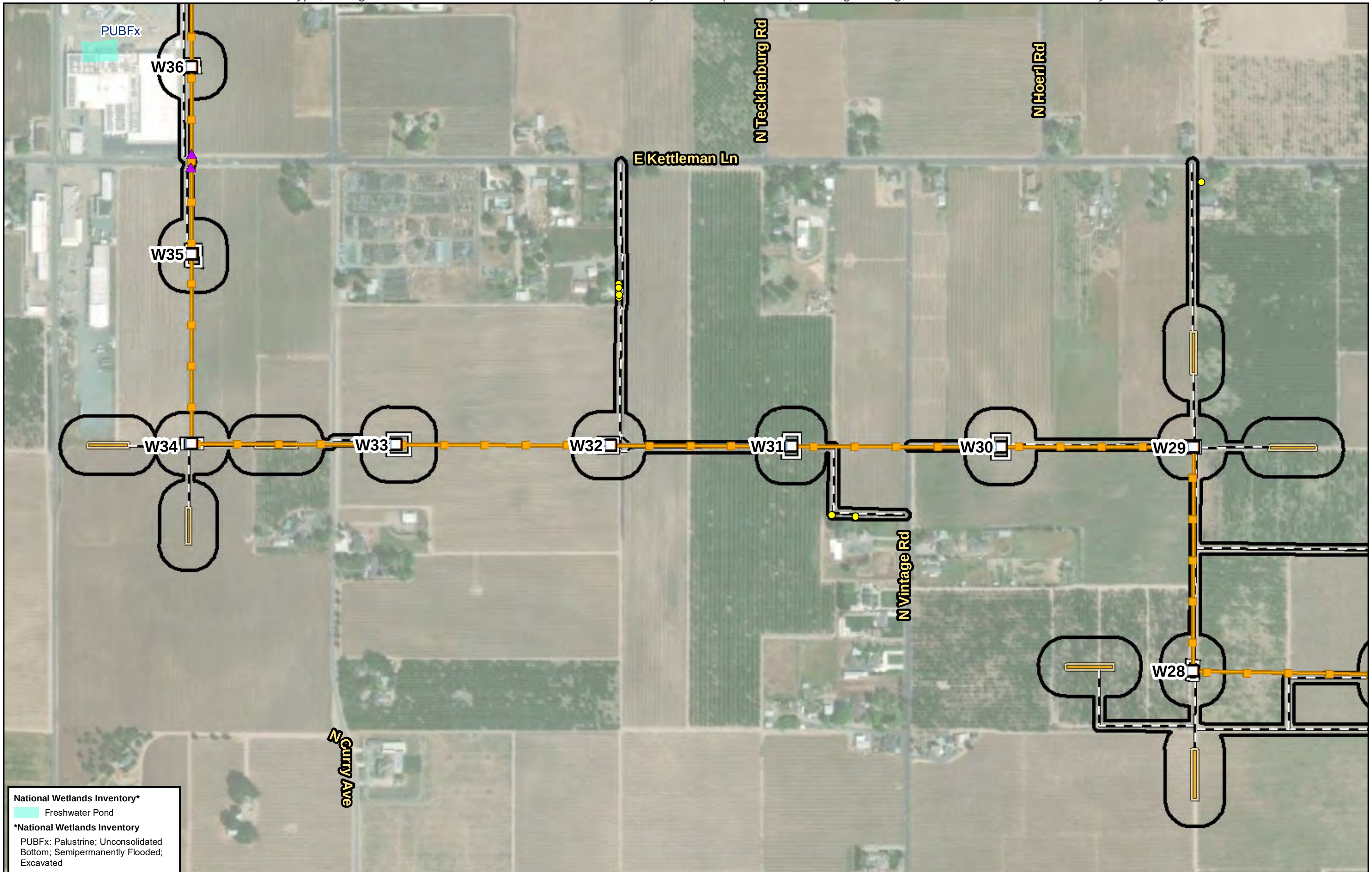

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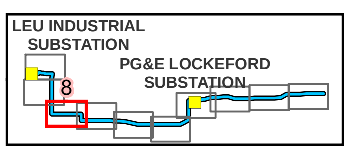

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Scale: 1:7,200

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 8 of 10
Northern San Joaquin 230 kV Transmission Project

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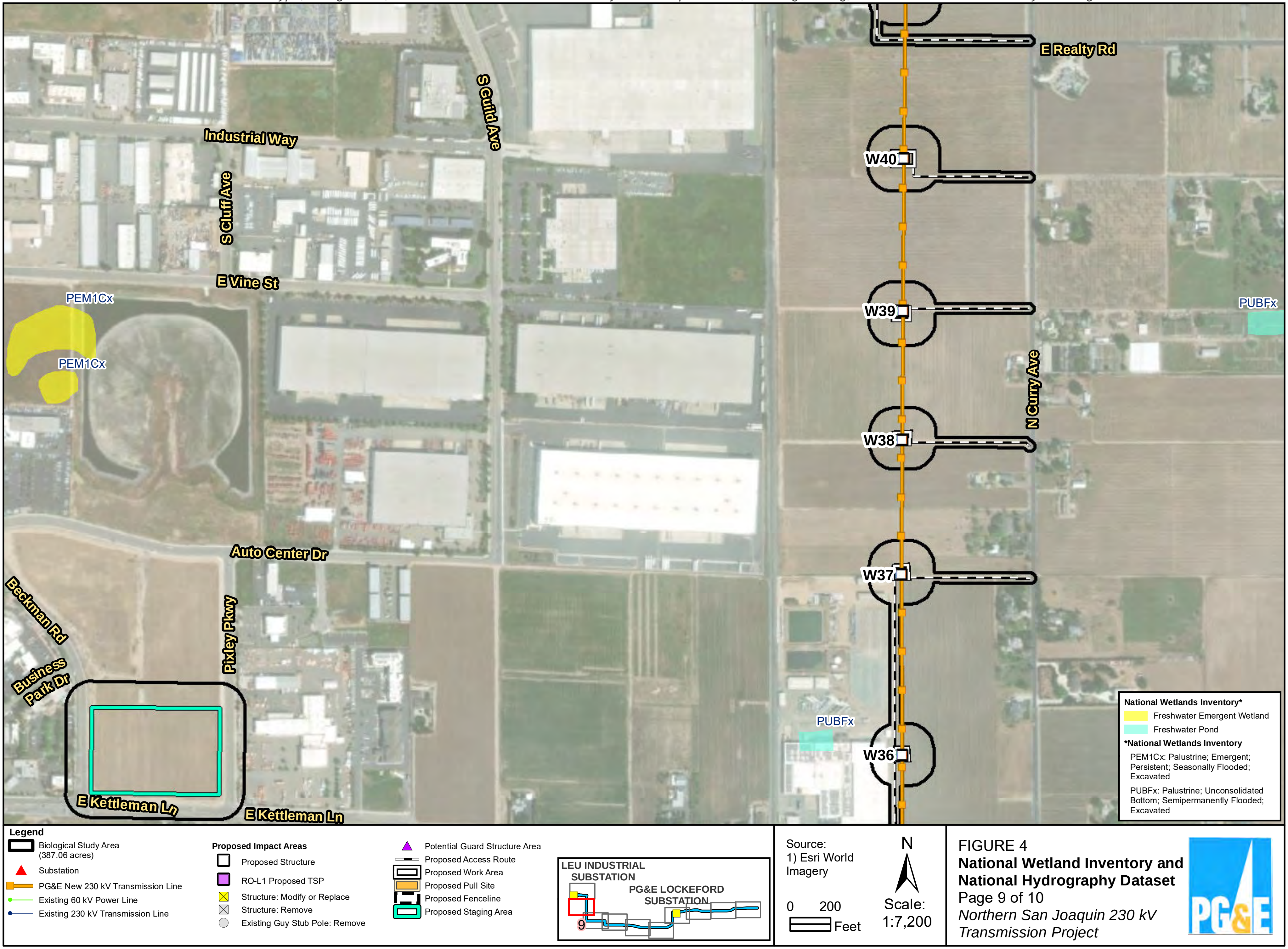

FIGURE 4
National Wetland Inventory and National Hydrography Dataset
Page 9 of 10
Northern San Joaquin 230 kV Transmission Project

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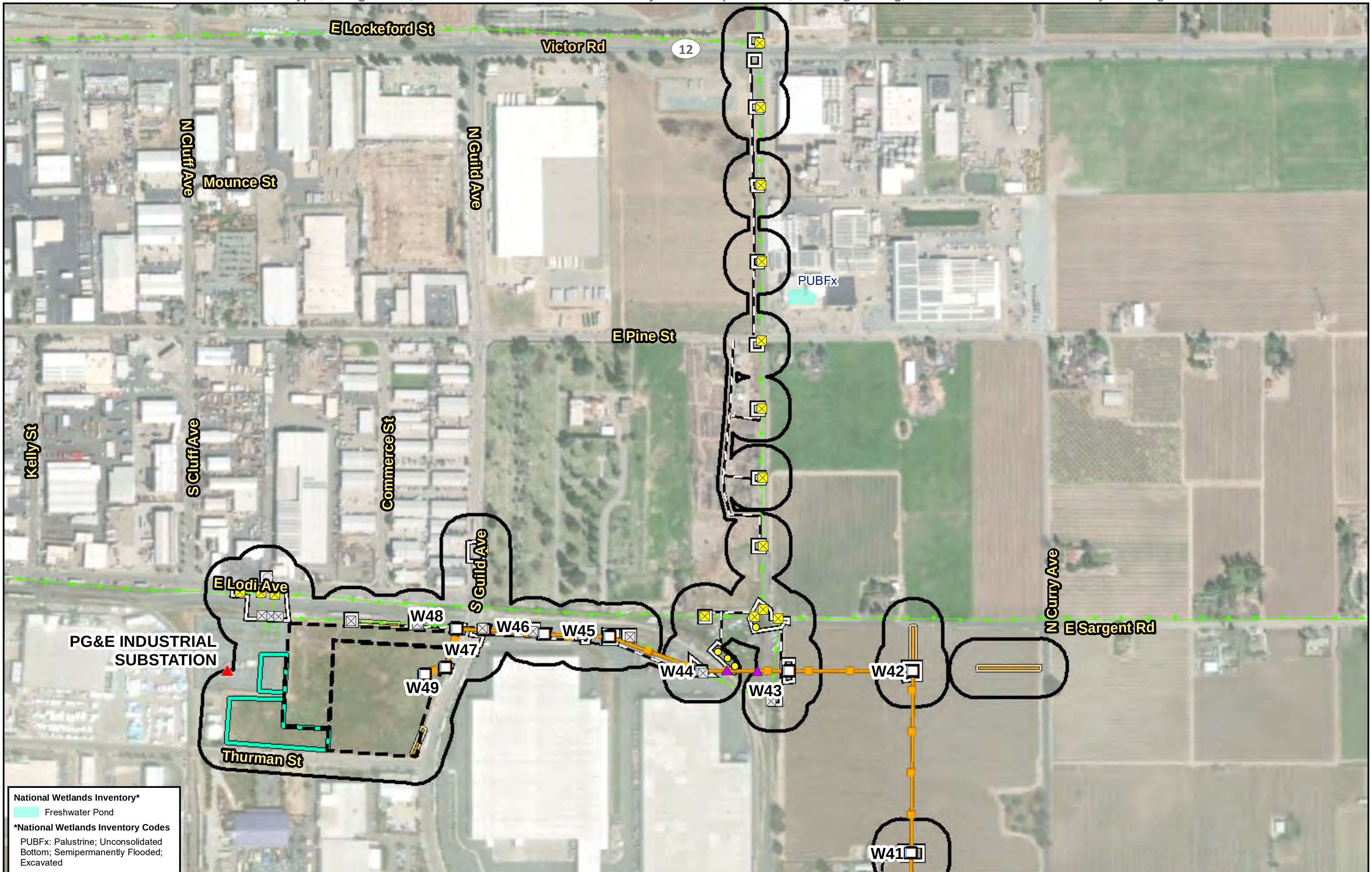

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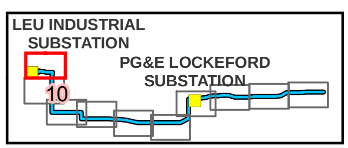

Source:
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FIGURE 4
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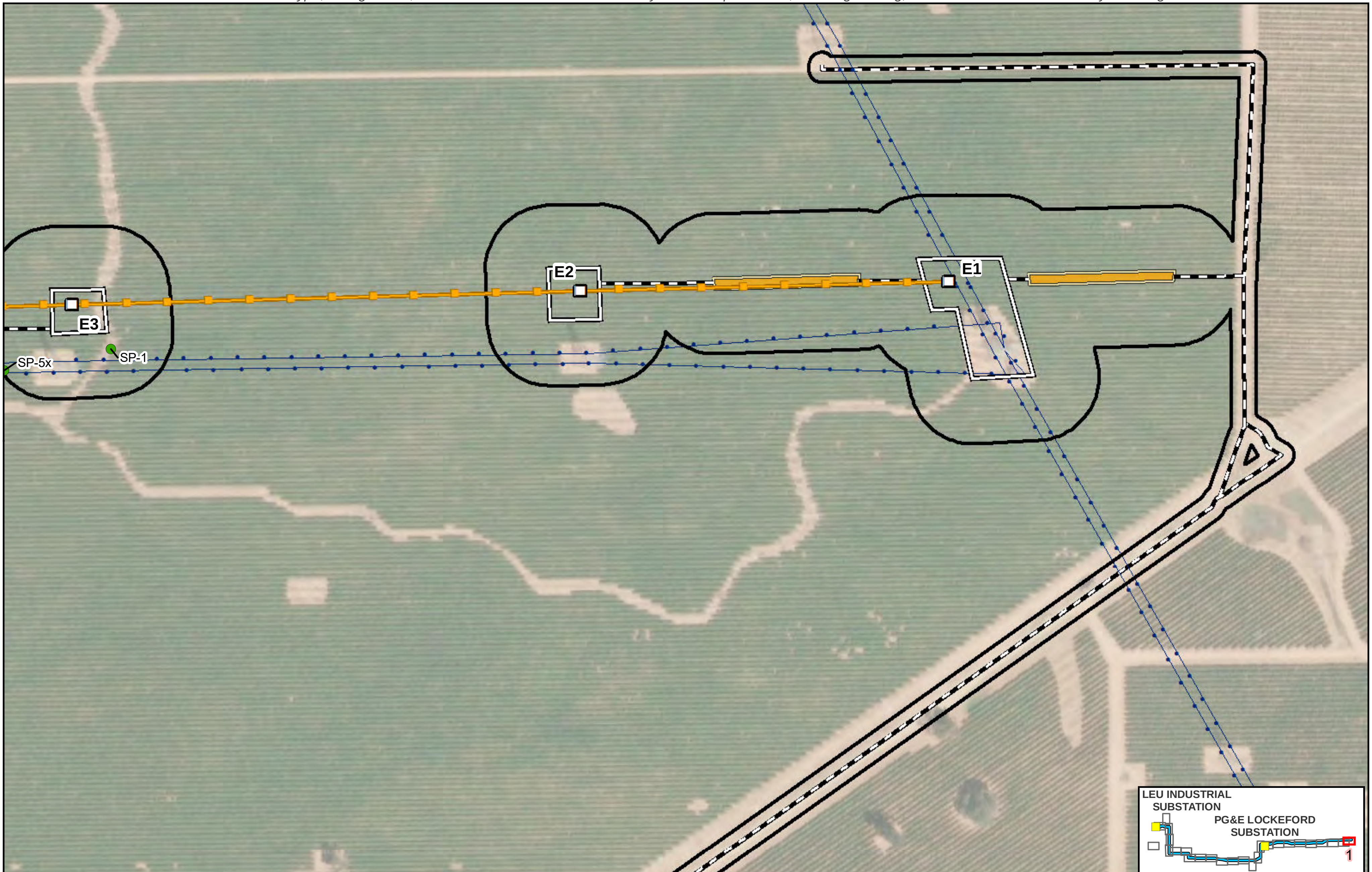

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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Wetland Sample Point

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 1 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_5_230818.mxd kgrant1 8/21/2023

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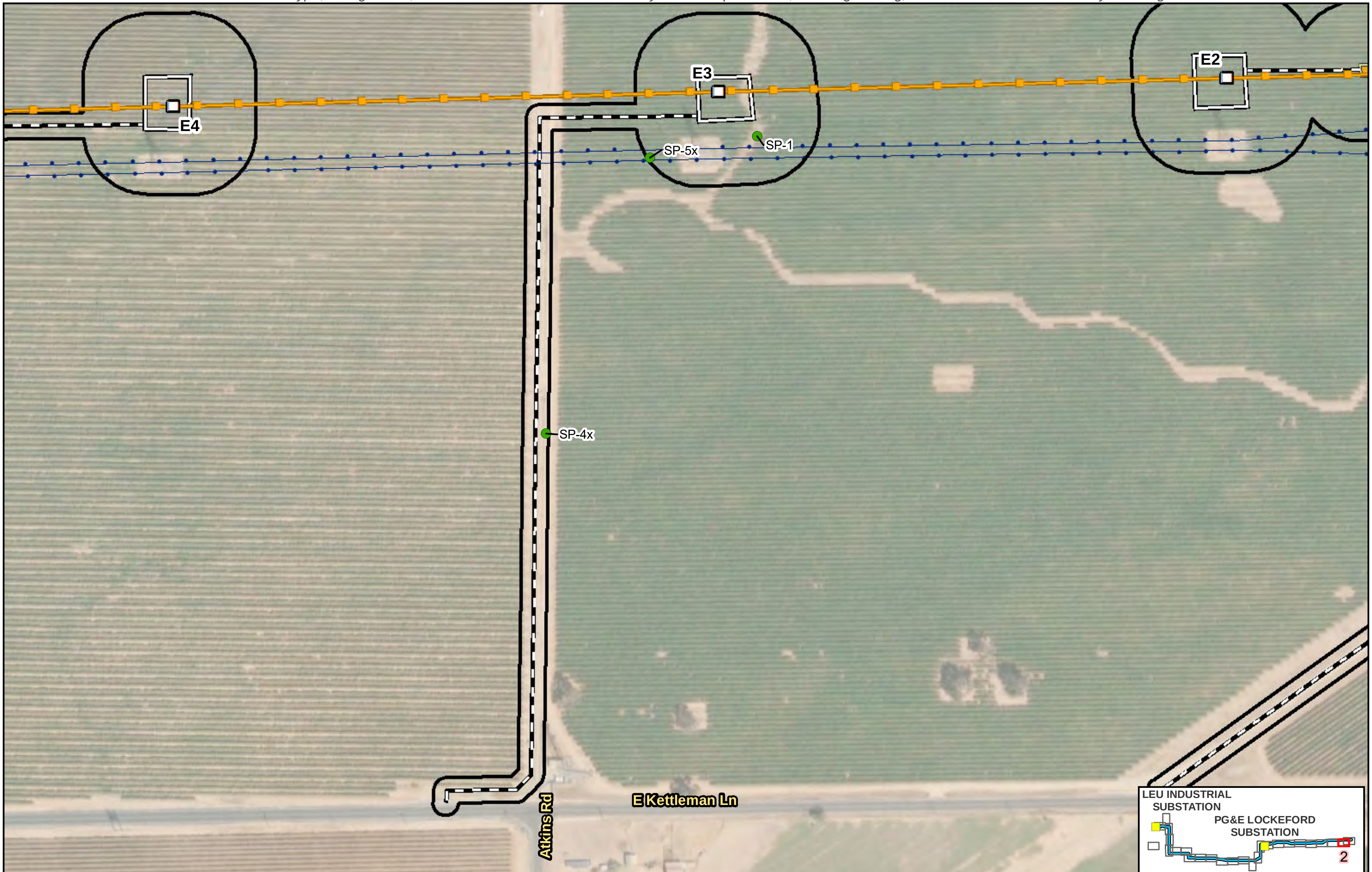

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 2 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_5_230818.mxd kgrant1 8/21/2023

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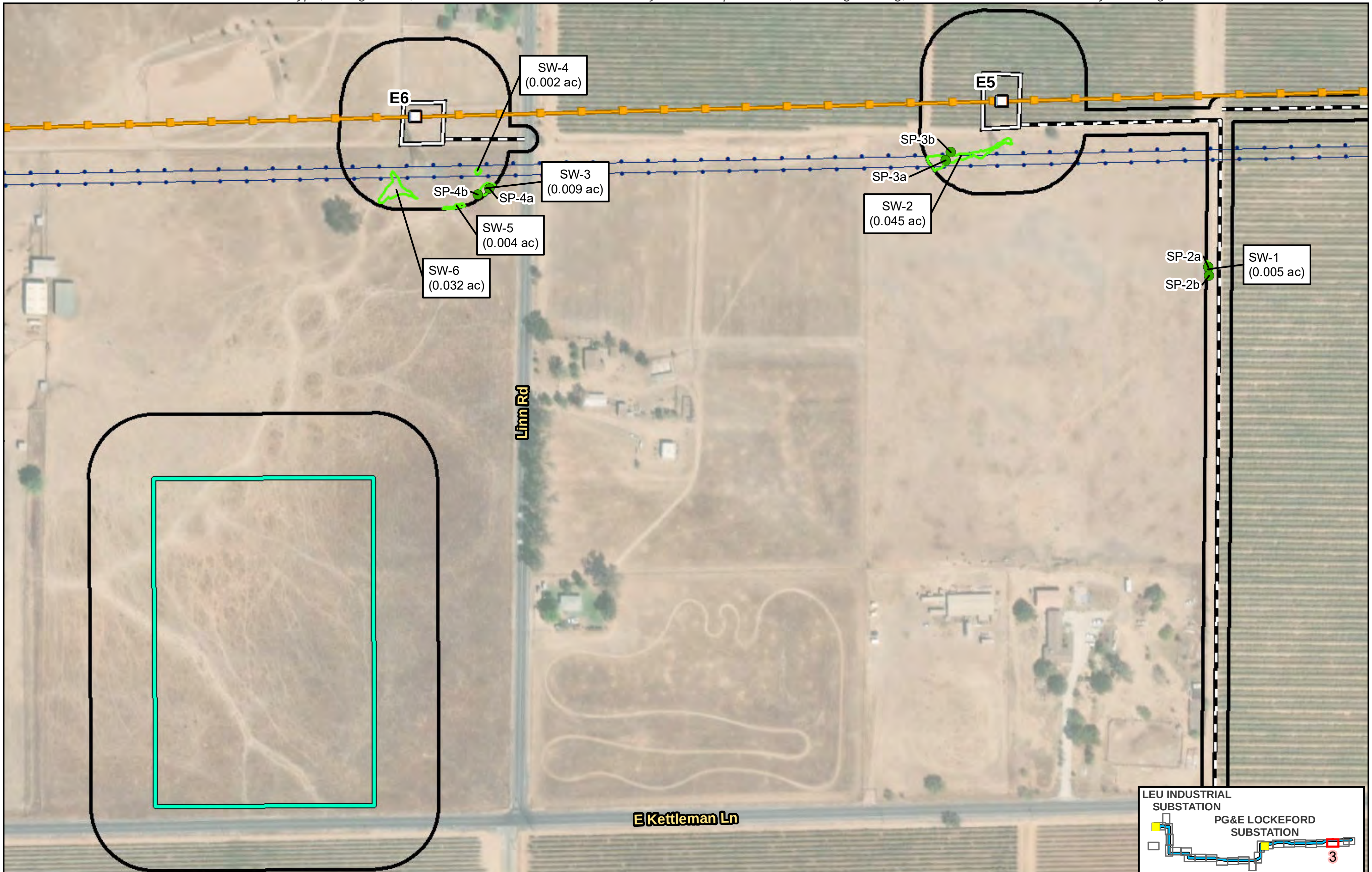

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Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Seasonal Wetland (SW) (0.2 ac)
- Wetland Sample Point

Source:
1) Esri World Imagery

N

Scale: 1:3,000
0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 3 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_5_230818.mxd kgrant1 8/21/2023

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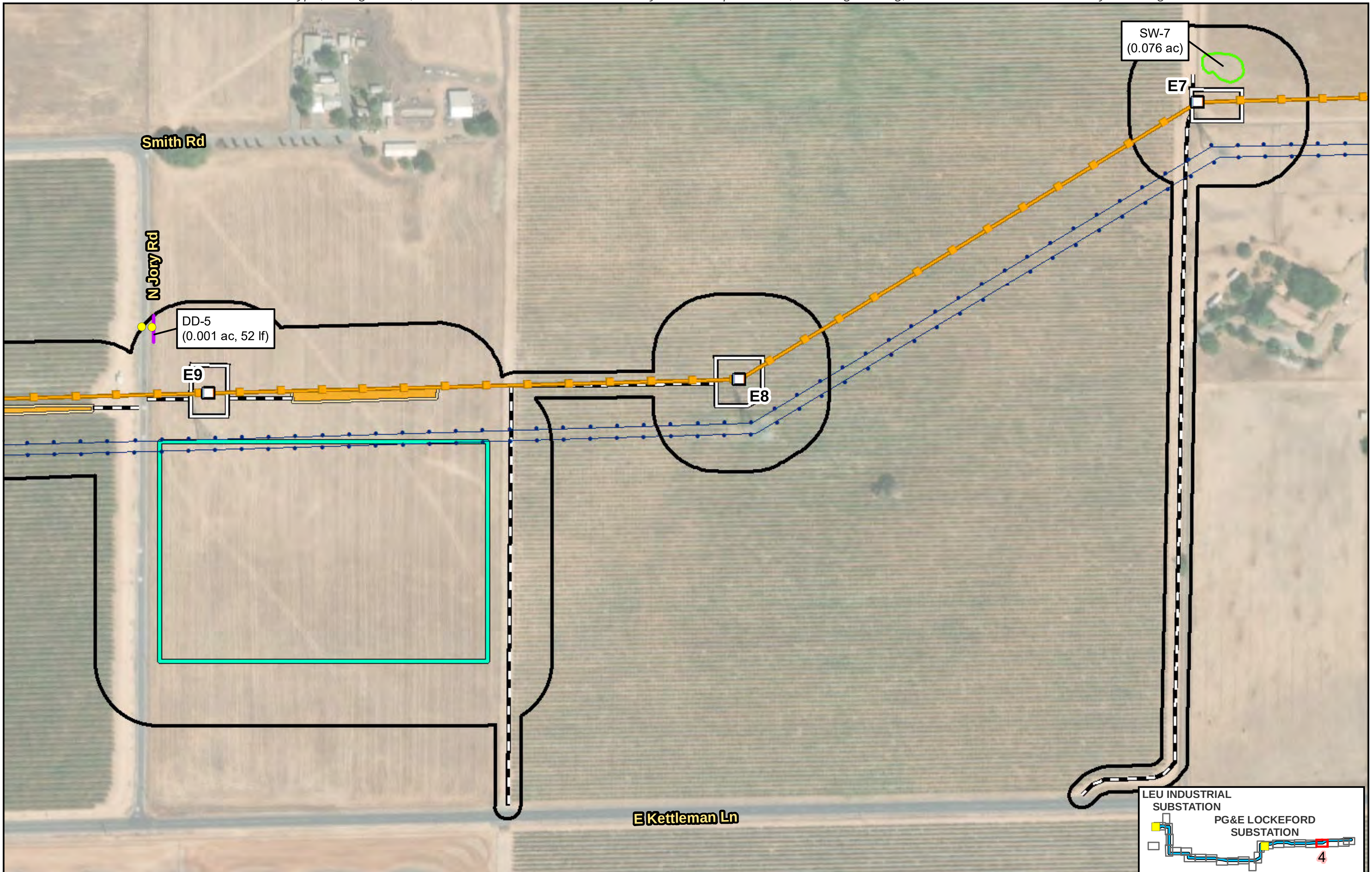

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Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Seasonal Wetland (SW) (0.2 ac)
- Drainage Ditch (DD) (0.127 ac, 1,805 lf)
- Culvert

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 4 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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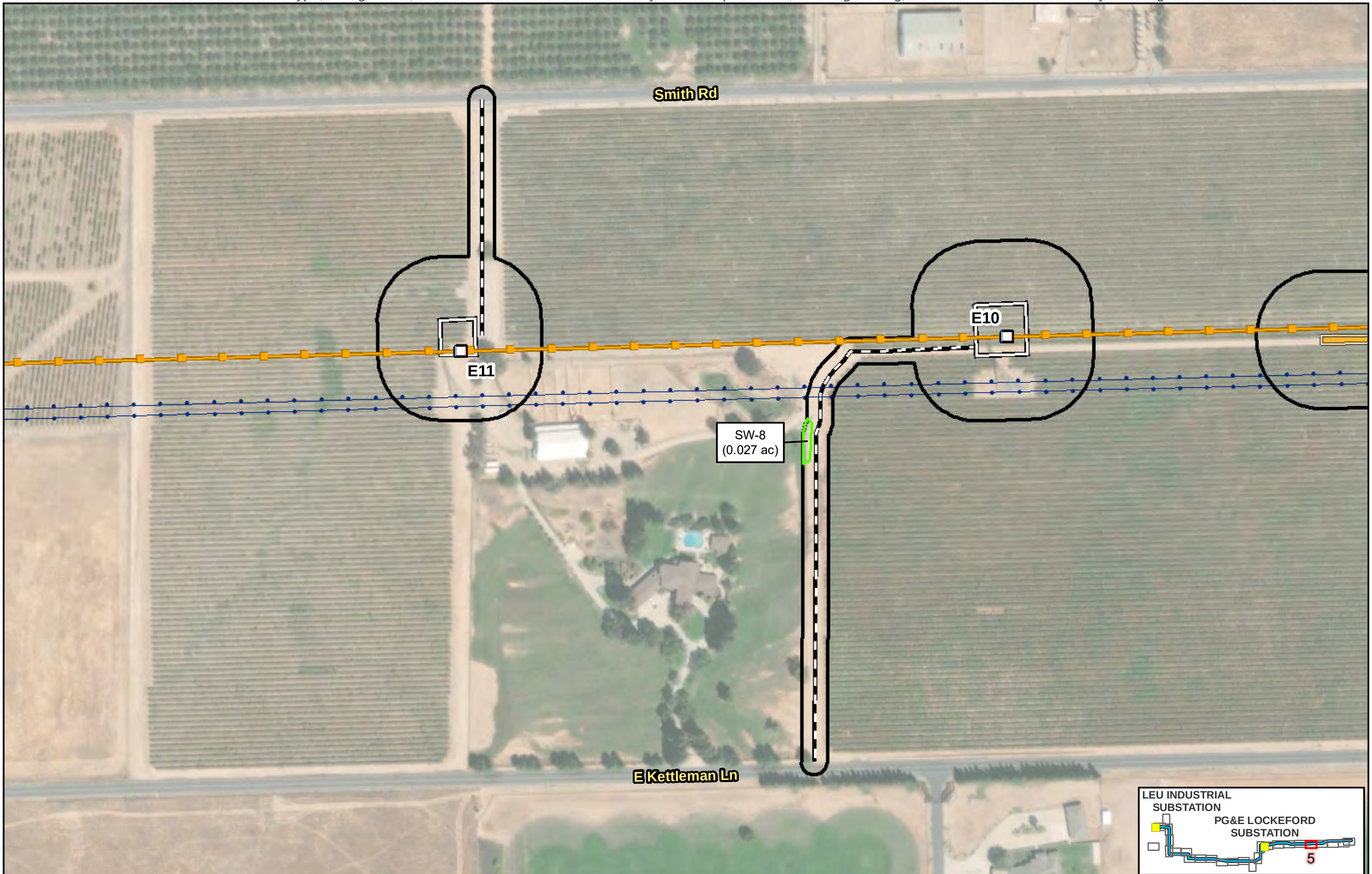

Legend

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Potentially Jurisdictional Aquatic Resources and Riparian Habitat

Seasonal Wetland (SW) (0.2 ac)

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 5 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Delineation\Figure_5_230818.mxd kgrant1 8/21/2023

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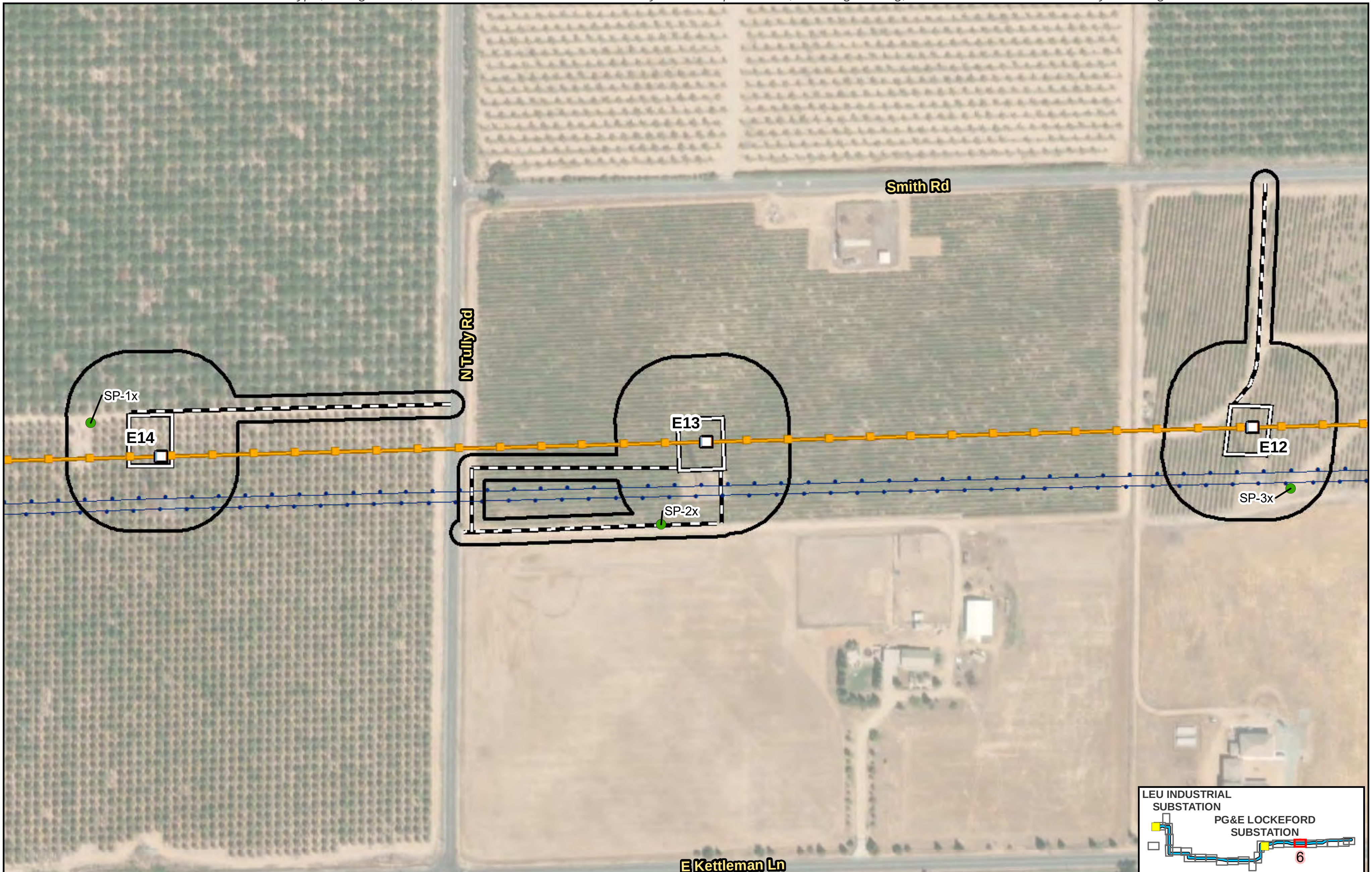

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- Wetland Sample Point

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 6 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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Preliminary design and engineering for the physical, civil, and outdoor components.
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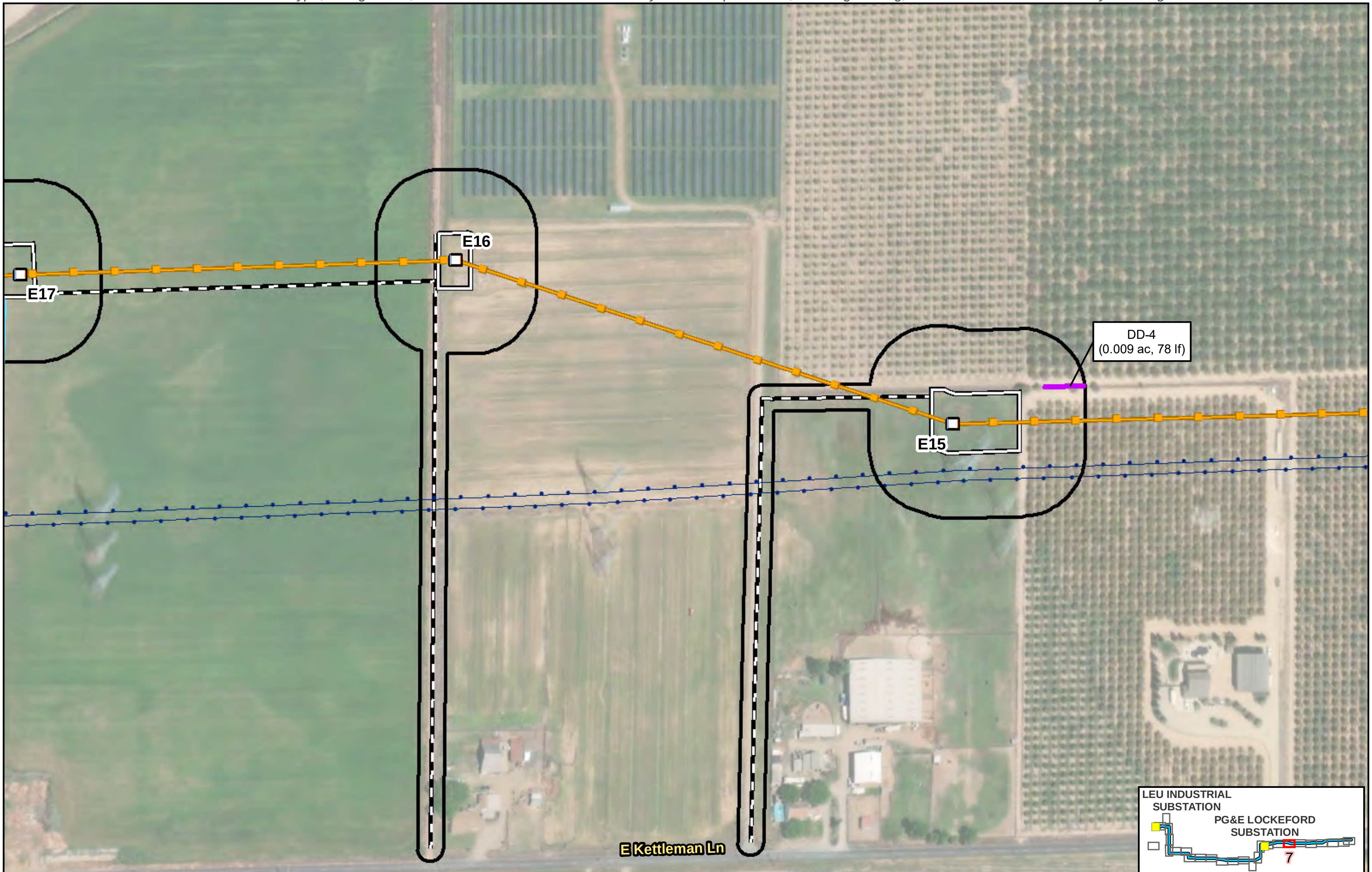

Legend

- Biological Study Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Drainage Ditch (DD) (0.127 ac, 1,805 lf)

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 7 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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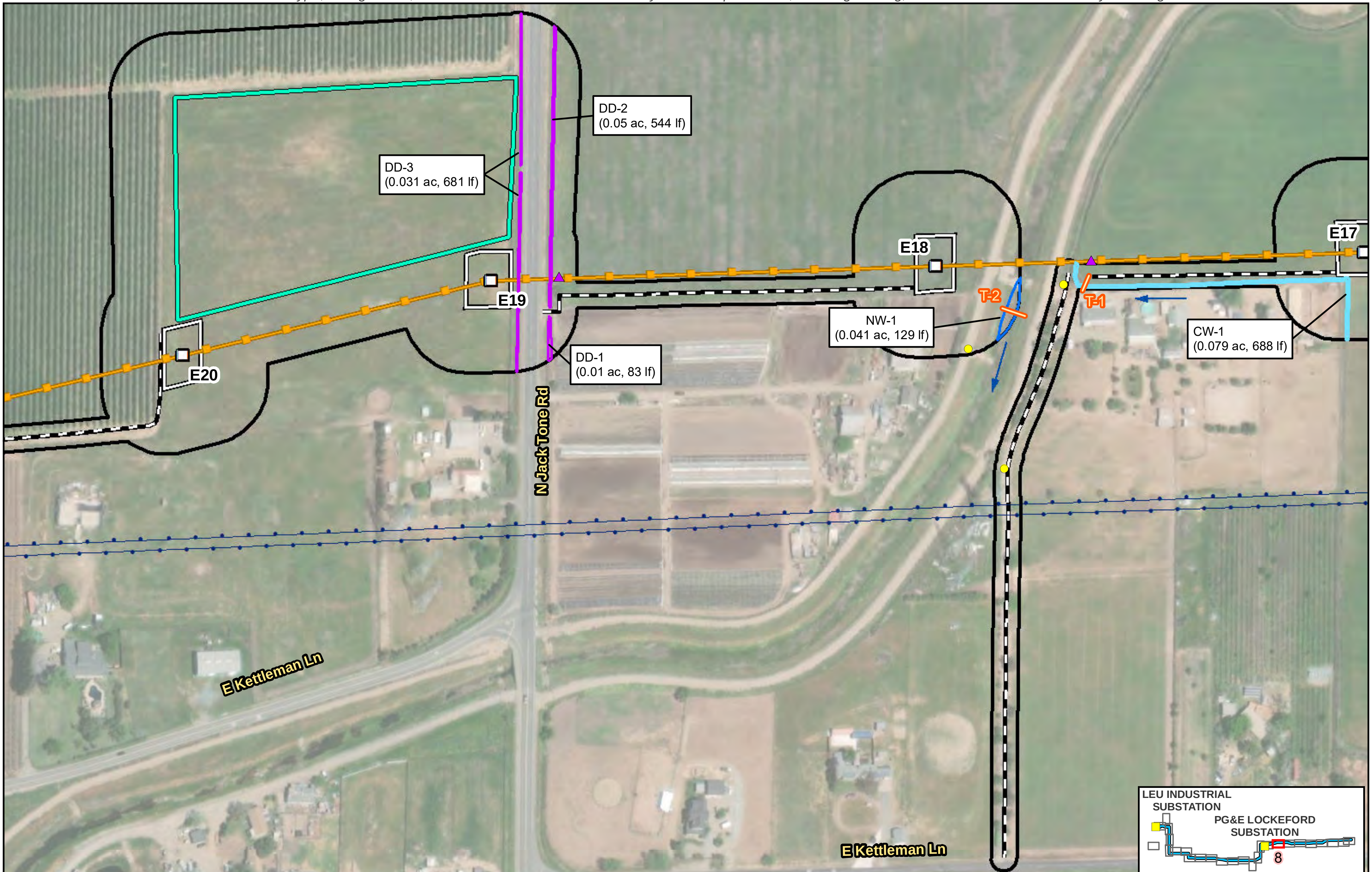

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Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Natural Watercourse (NW) (0.247 ac, 359 lf)
- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Drainage Ditch (DD) (0.127 ac, 1,805 lf)
- Culvert
- Flow Direction
- Transect

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 8 of 26
Northern San Joaquin 230 kV Transmission Project

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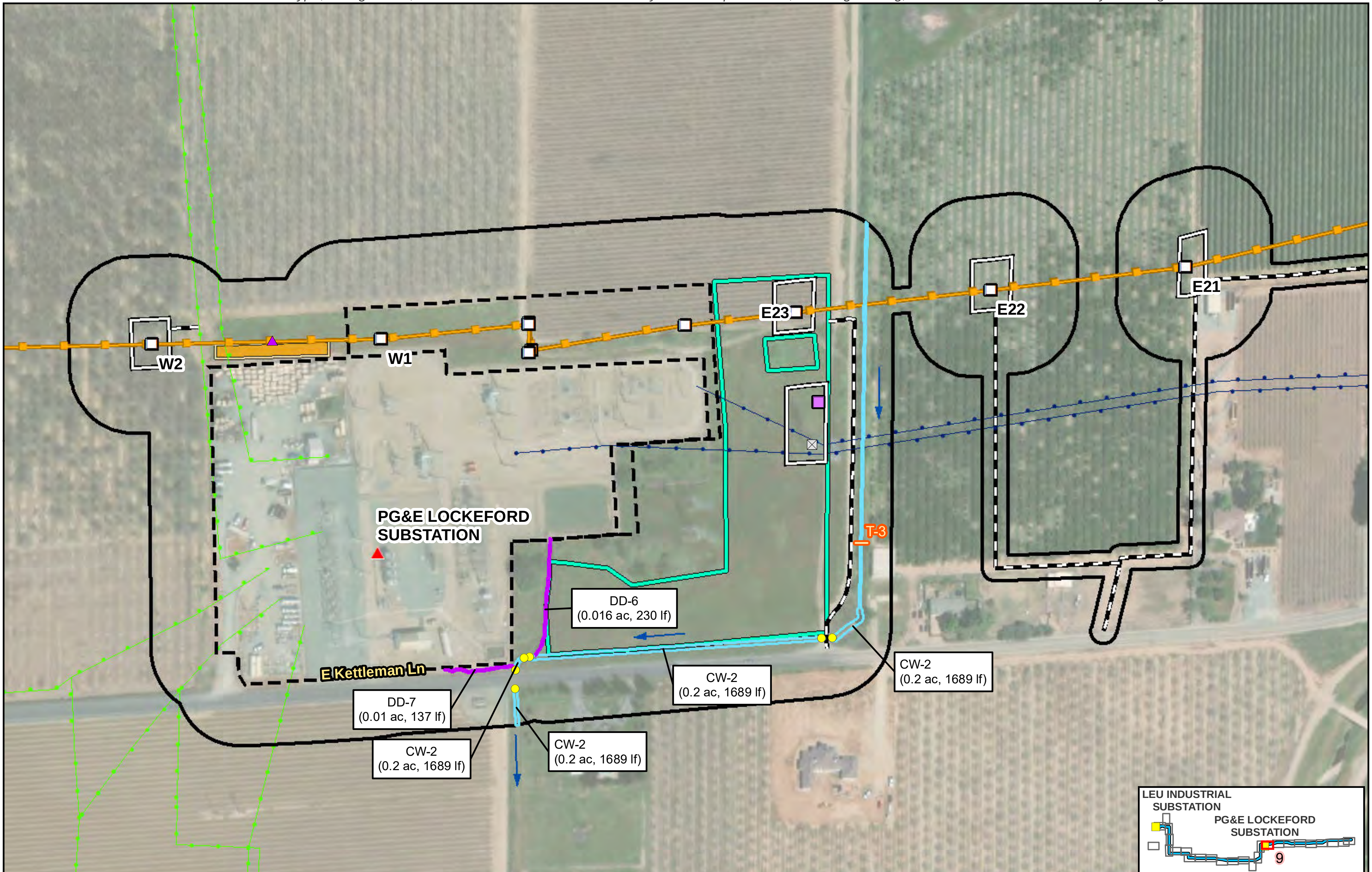

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Source:
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Scale: 1:3,000

0 100 Feet

FIGURE 5
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Page 9 of 26
Northern San Joaquin 230 kV Transmission Project

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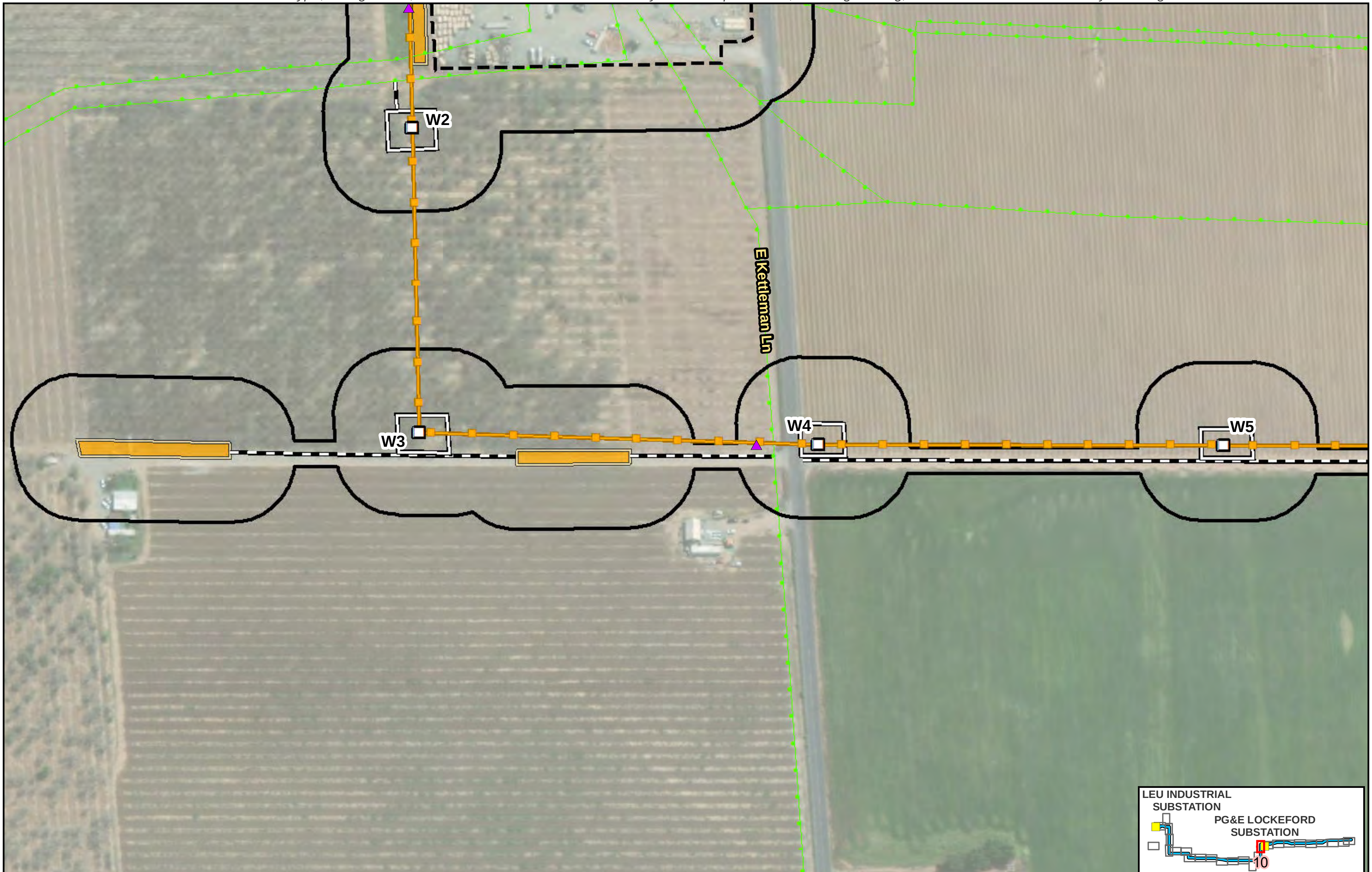

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1) Esri World Imagery

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Scale: 1:3,000

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FIGURE 5
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Page 10 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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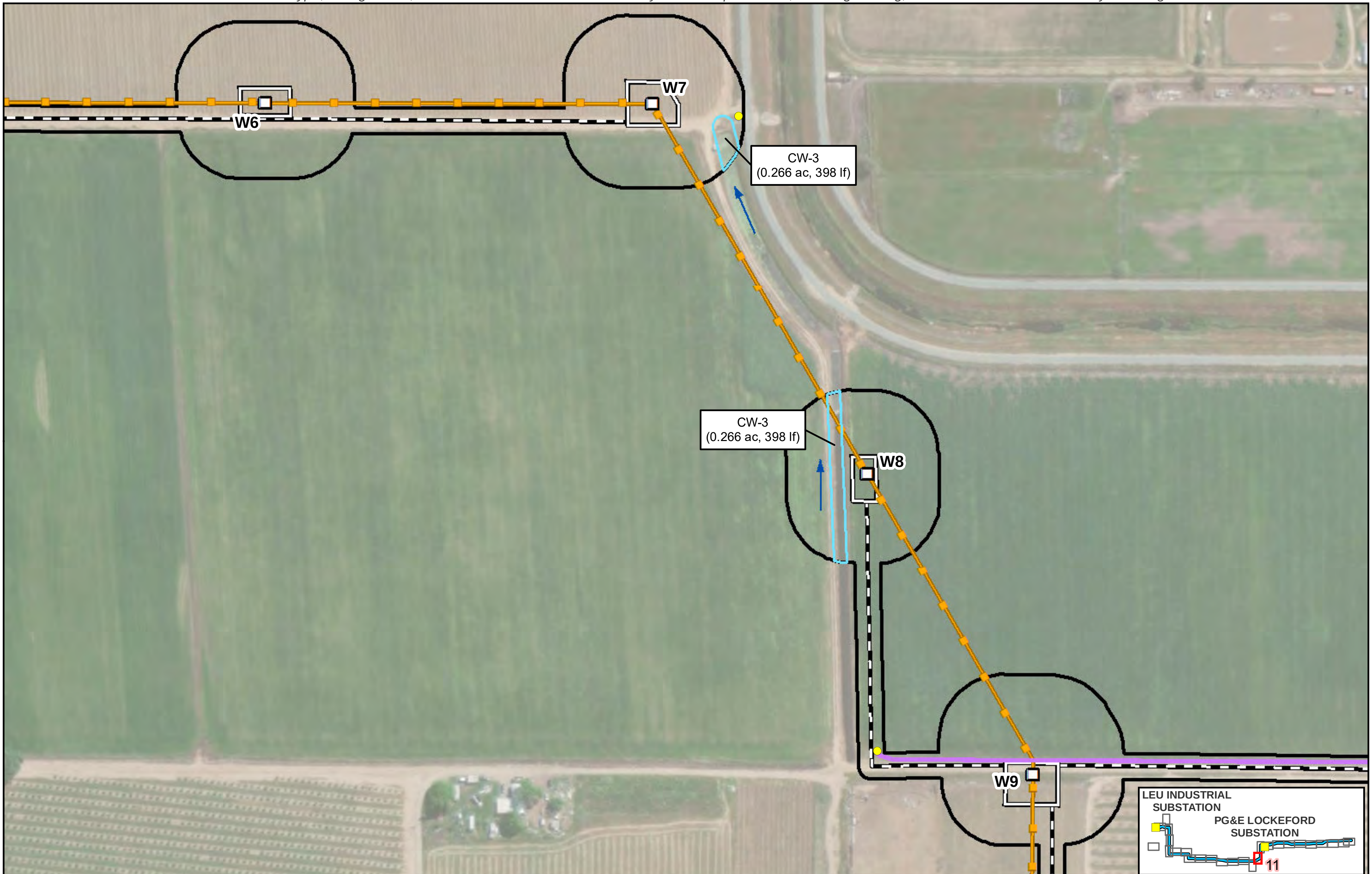

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Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Irrigation Ditch (ID) (0.152 ac, 1,654 lf)
- Culvert
- Flow Direction

Source:
1) Esri World Imagery

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Scale: 1:3,000
0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 11 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 12 of 26
Northern San Joaquin 230 kV Transmission Project

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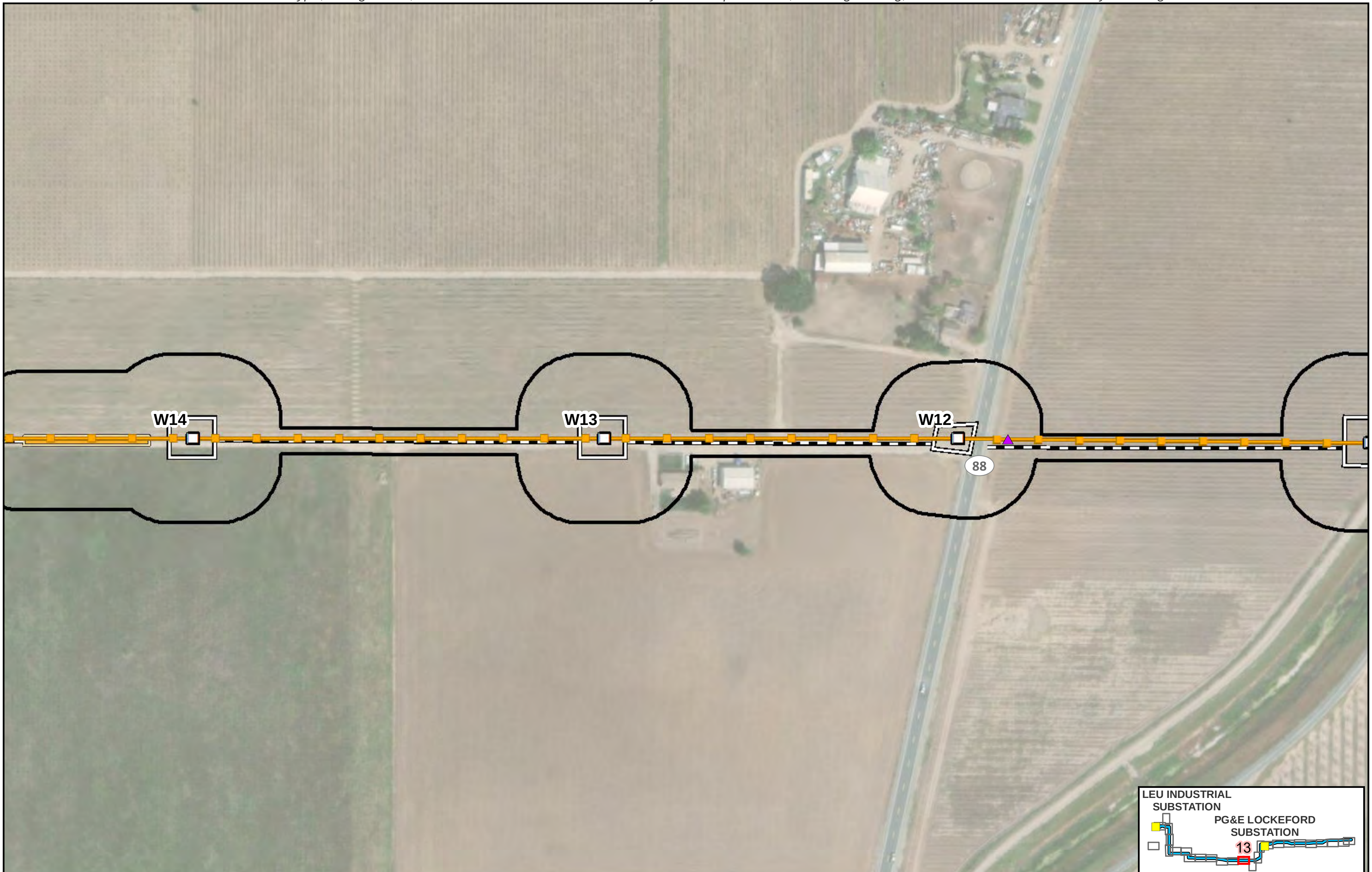

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
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Page 13 of 26
Northern San Joaquin 230 kV Transmission Project

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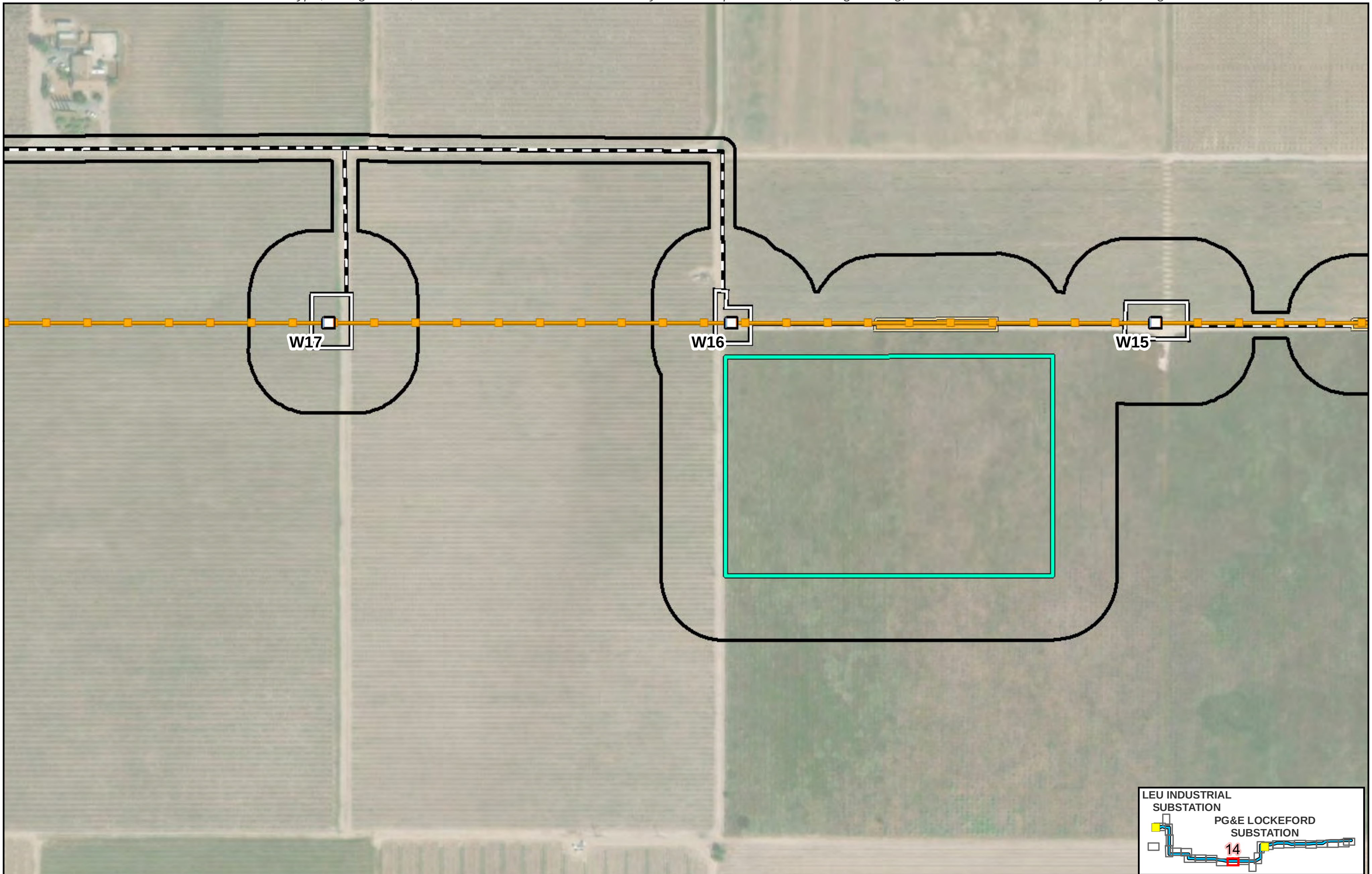

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Source:
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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 14 of 26
Northern San Joaquin 230 kV Transmission Project

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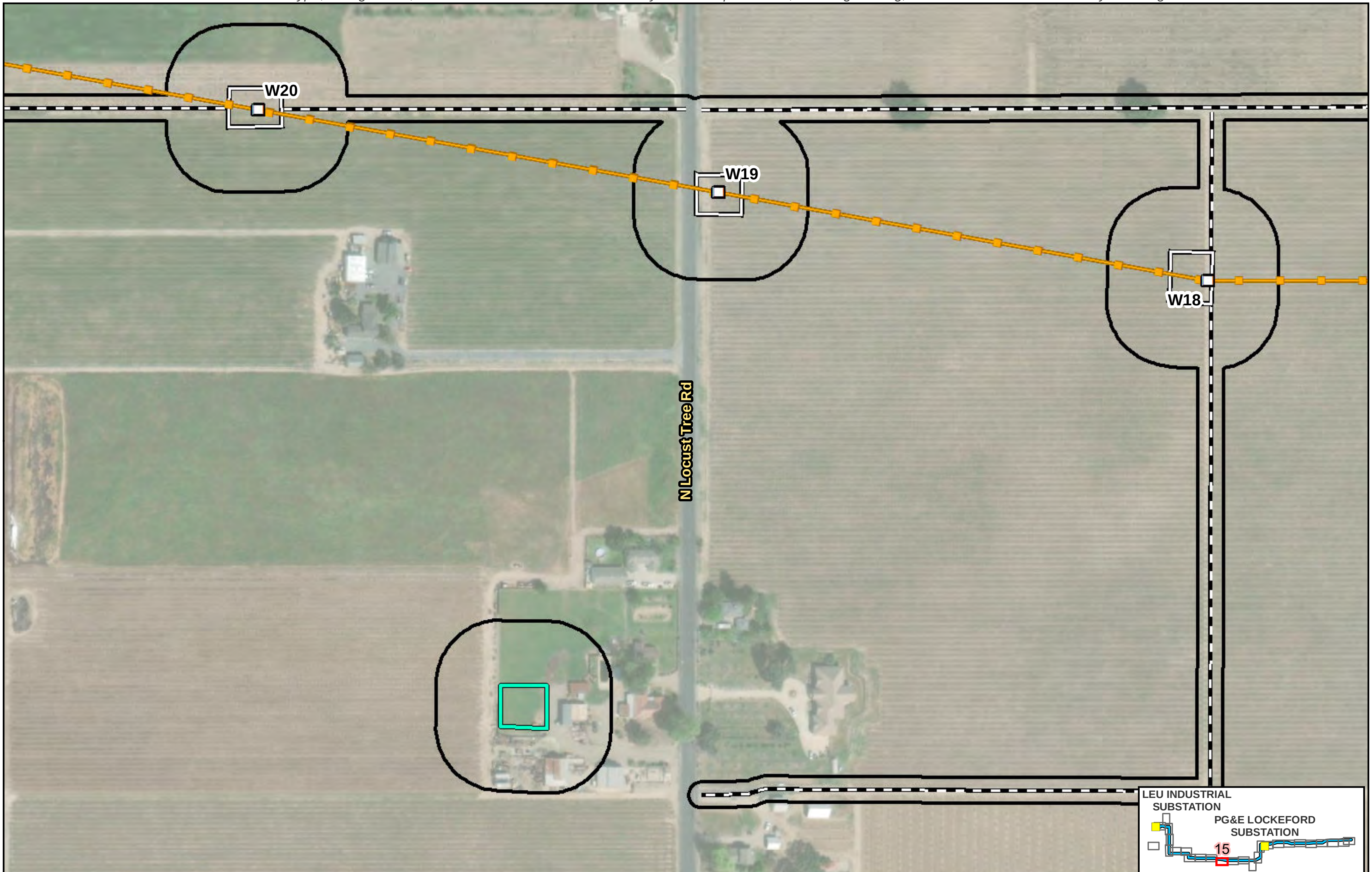

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 15 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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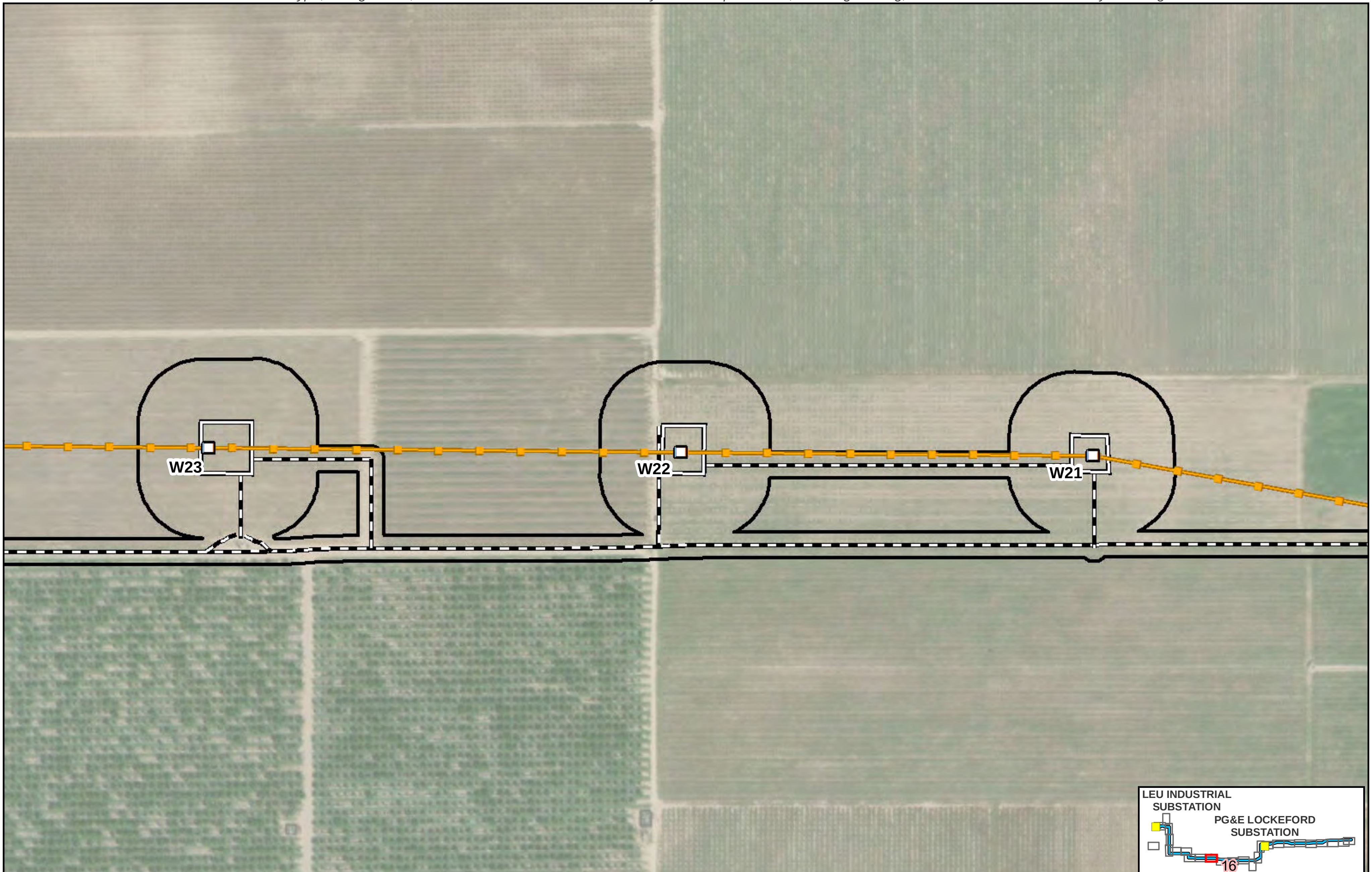

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
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Page 16 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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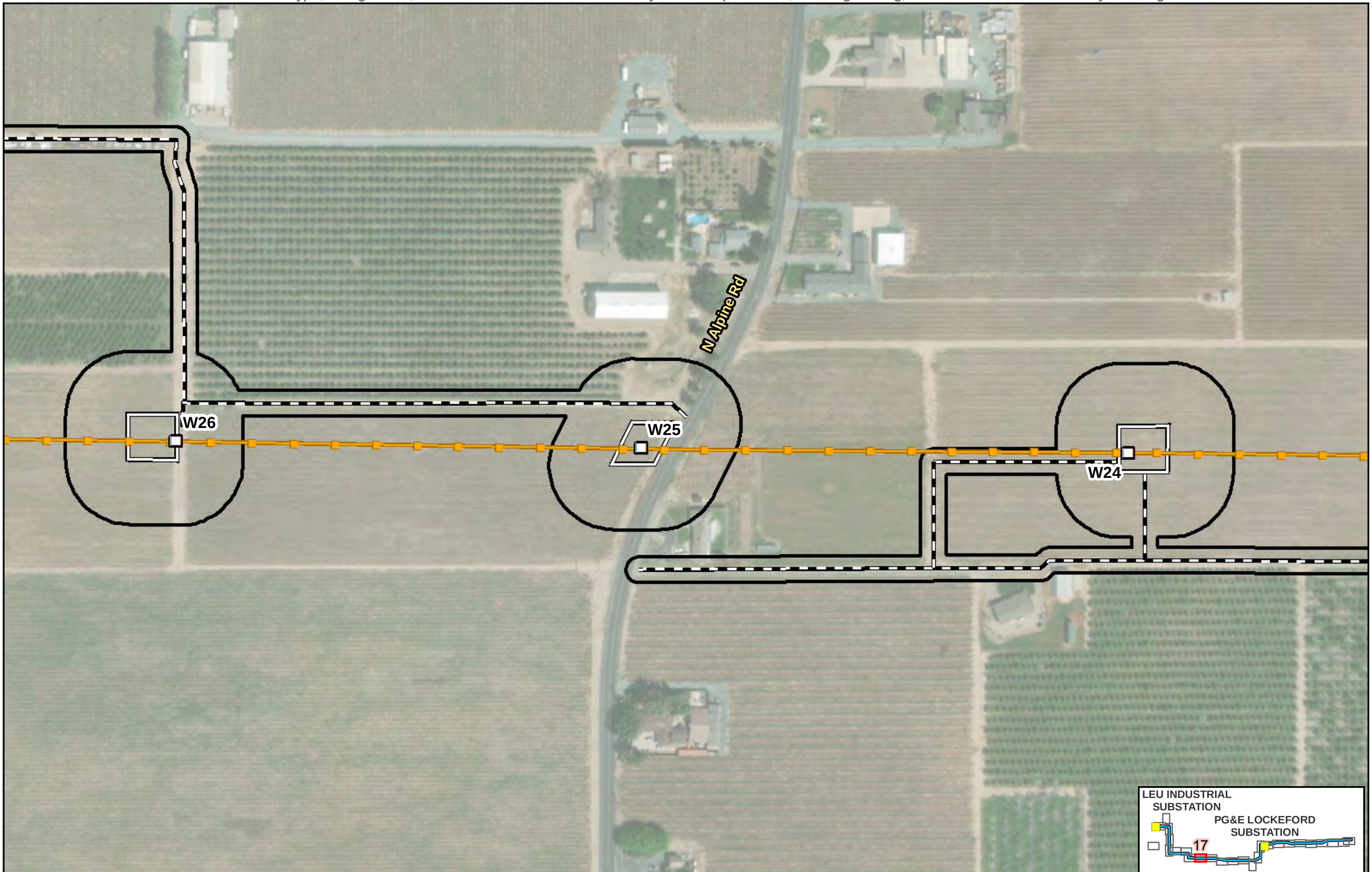

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 17 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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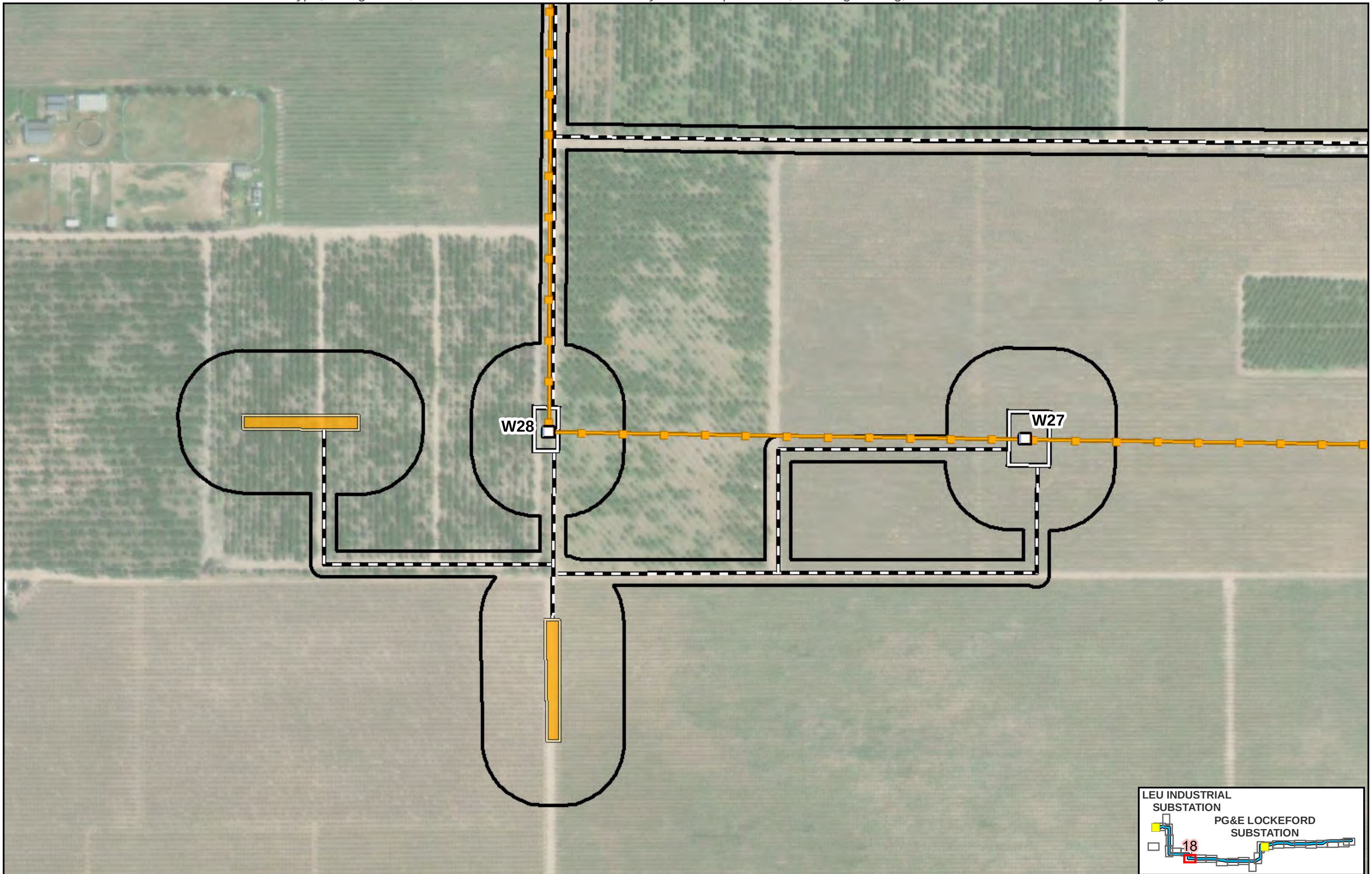

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 18 of 26
Northern San Joaquin 230 kV Transmission Project

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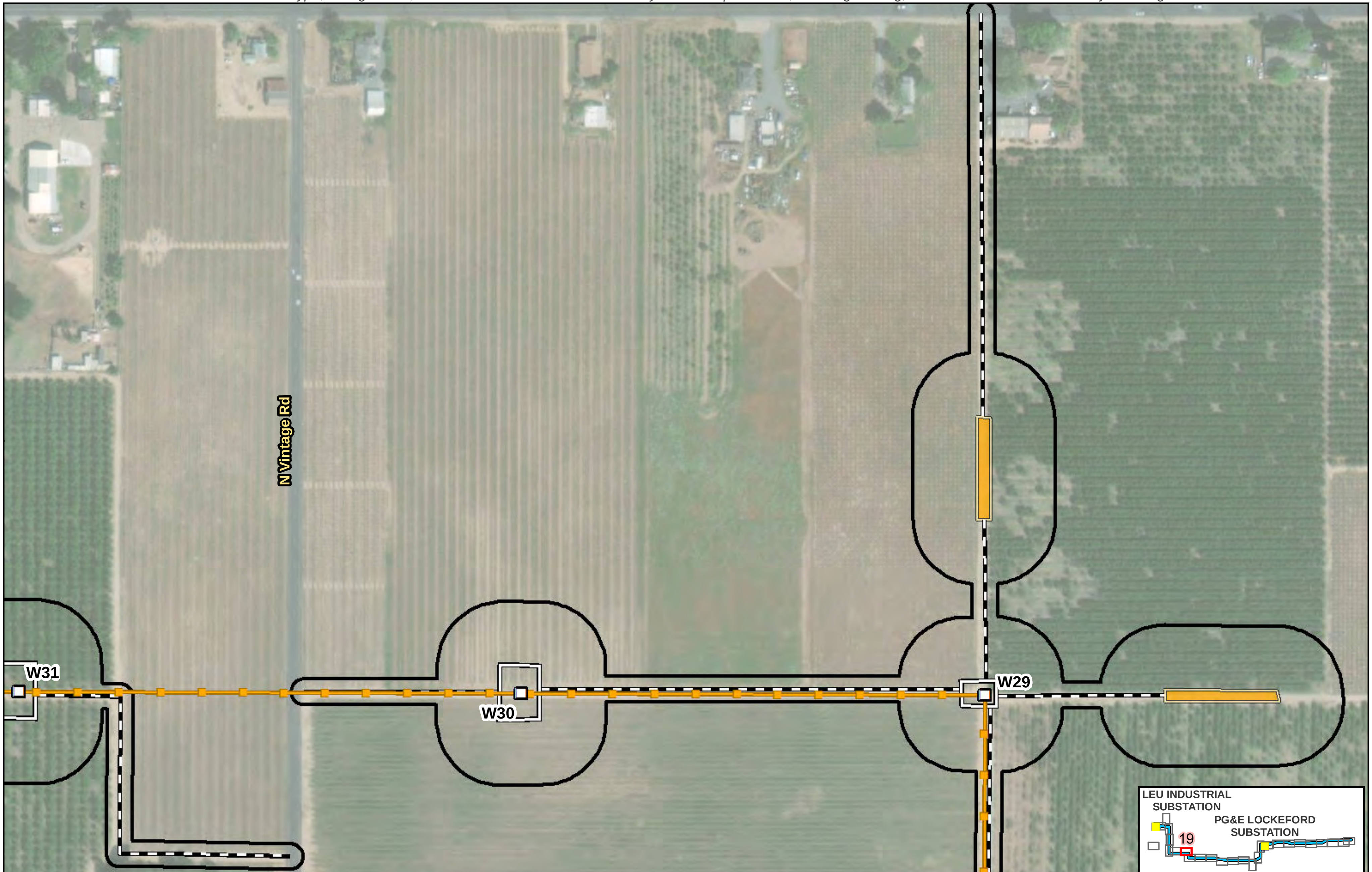

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
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Page 19 of 26
Northern San Joaquin 230 kV Transmission Project

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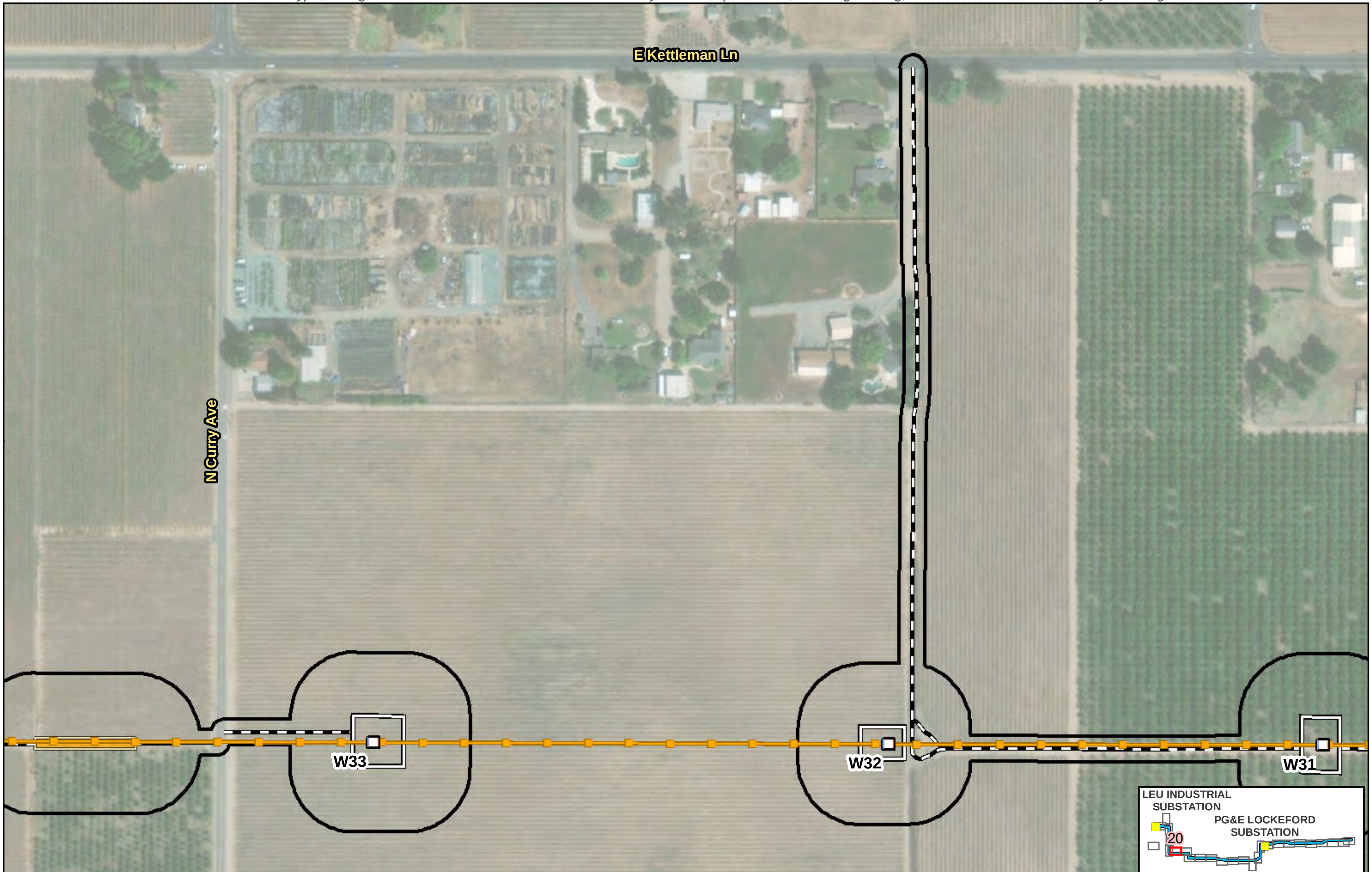

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Source:
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Scale: 1:3,000

0 100 Feet

FIGURE 5
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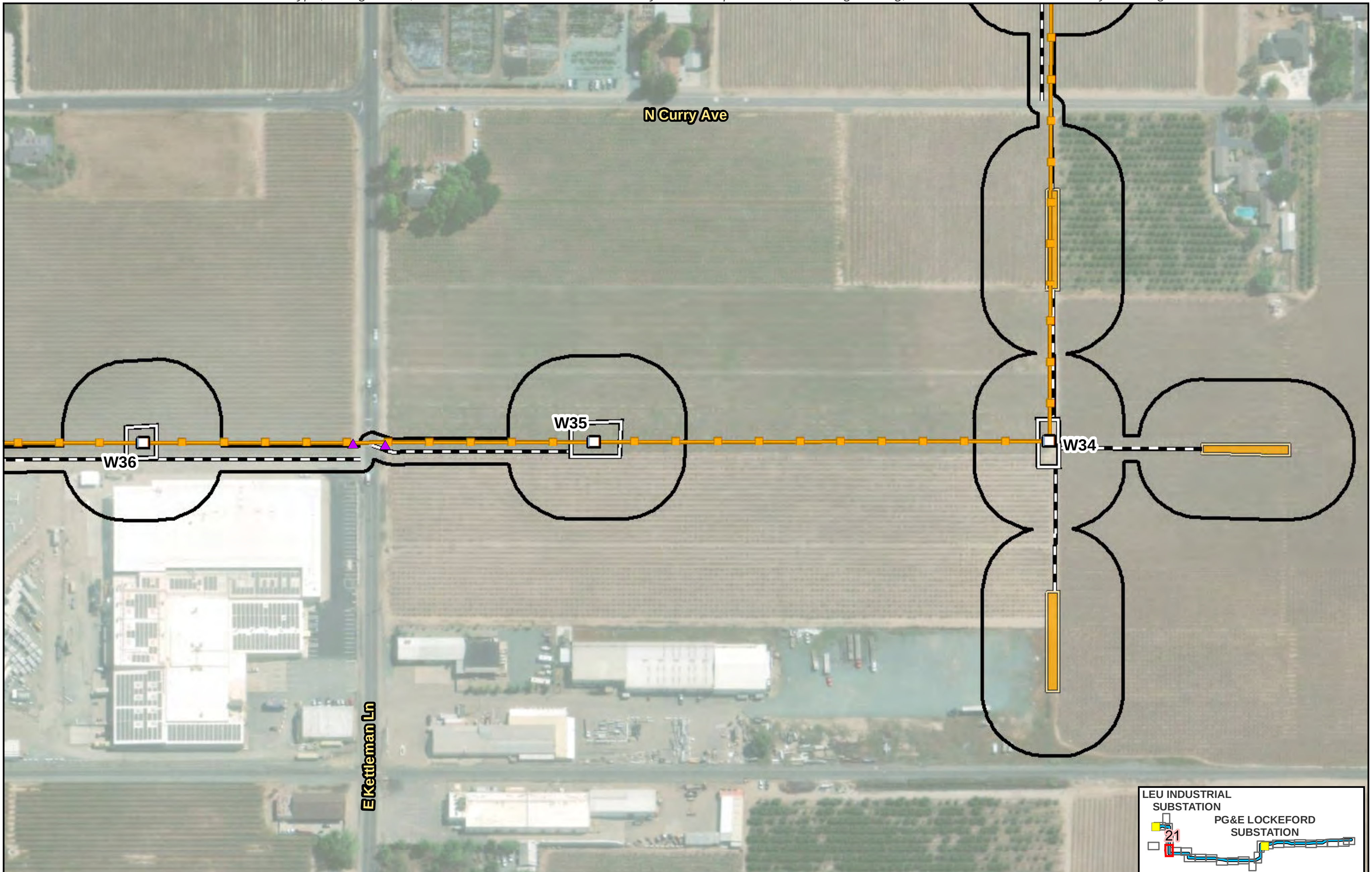

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 21 of 26
Northern San Joaquin 230 kV Transmission Project

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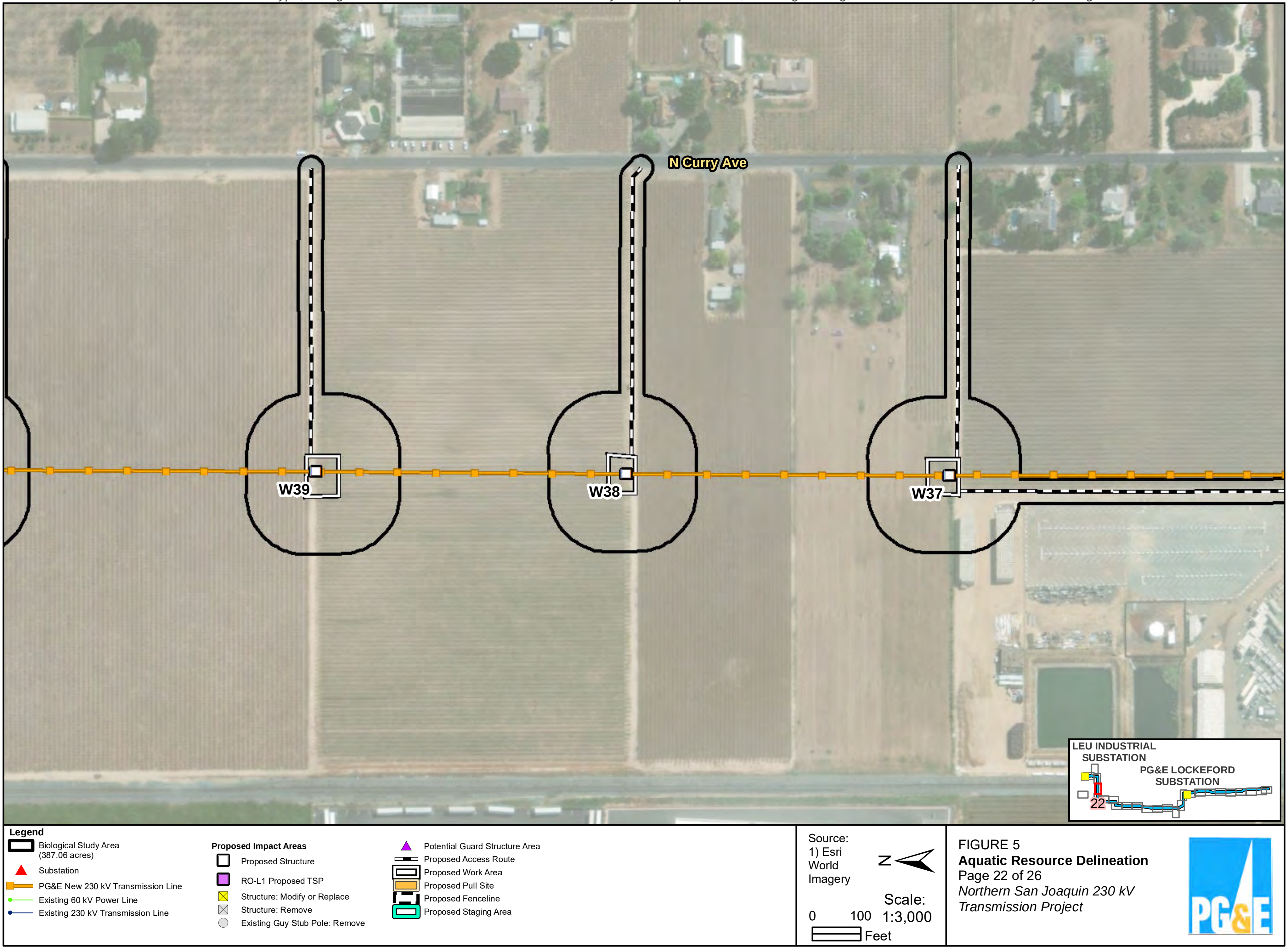

FIGURE 5
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Page 22 of 26
Northern San Joaquin 230 kV Transmission Project

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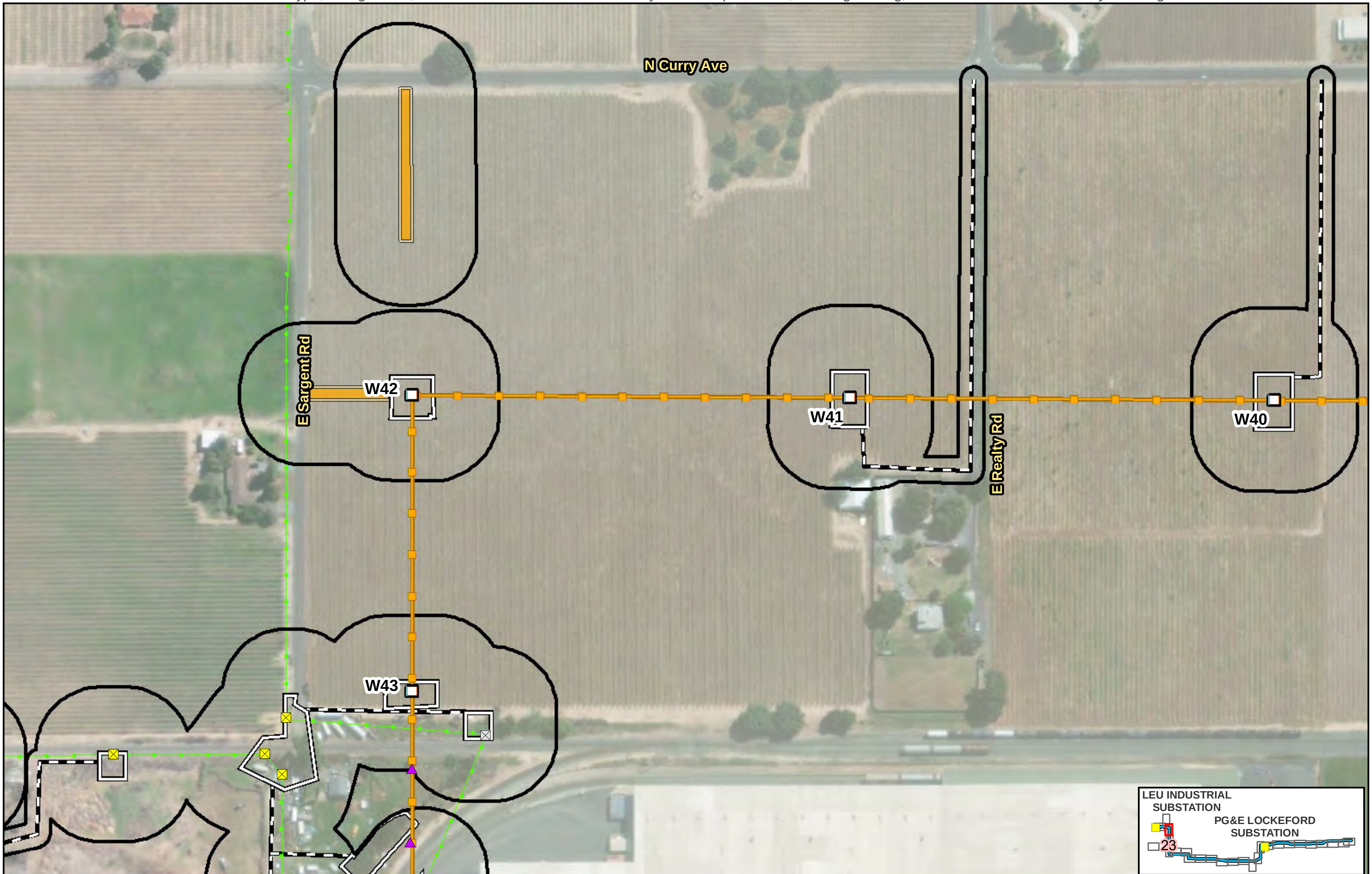

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Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
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Page 23 of 26
Northern San Joaquin 230 kV Transmission Project

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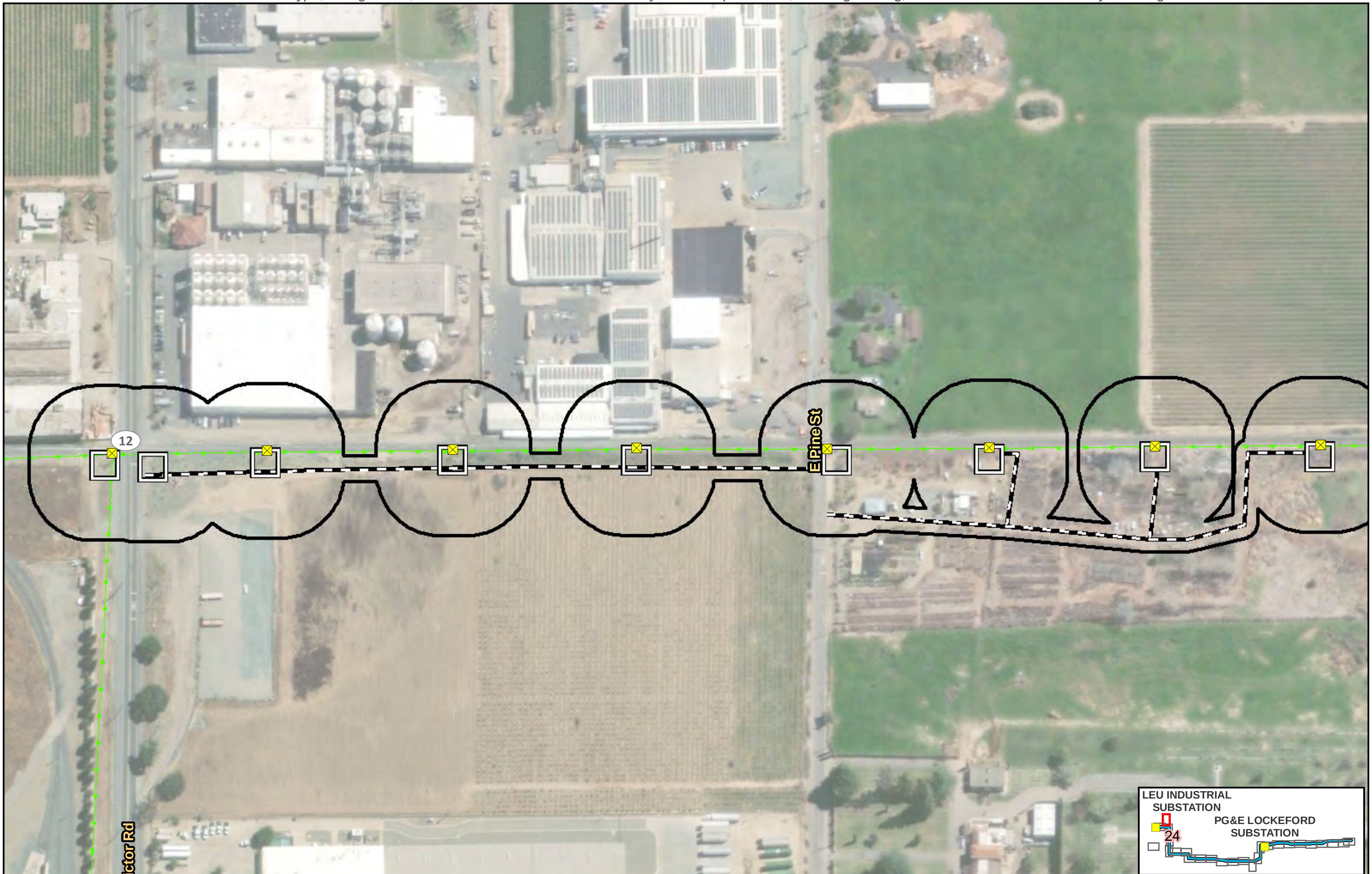

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Source:
1) Esri World Imagery

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FIGURE 5
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Page 24 of 26
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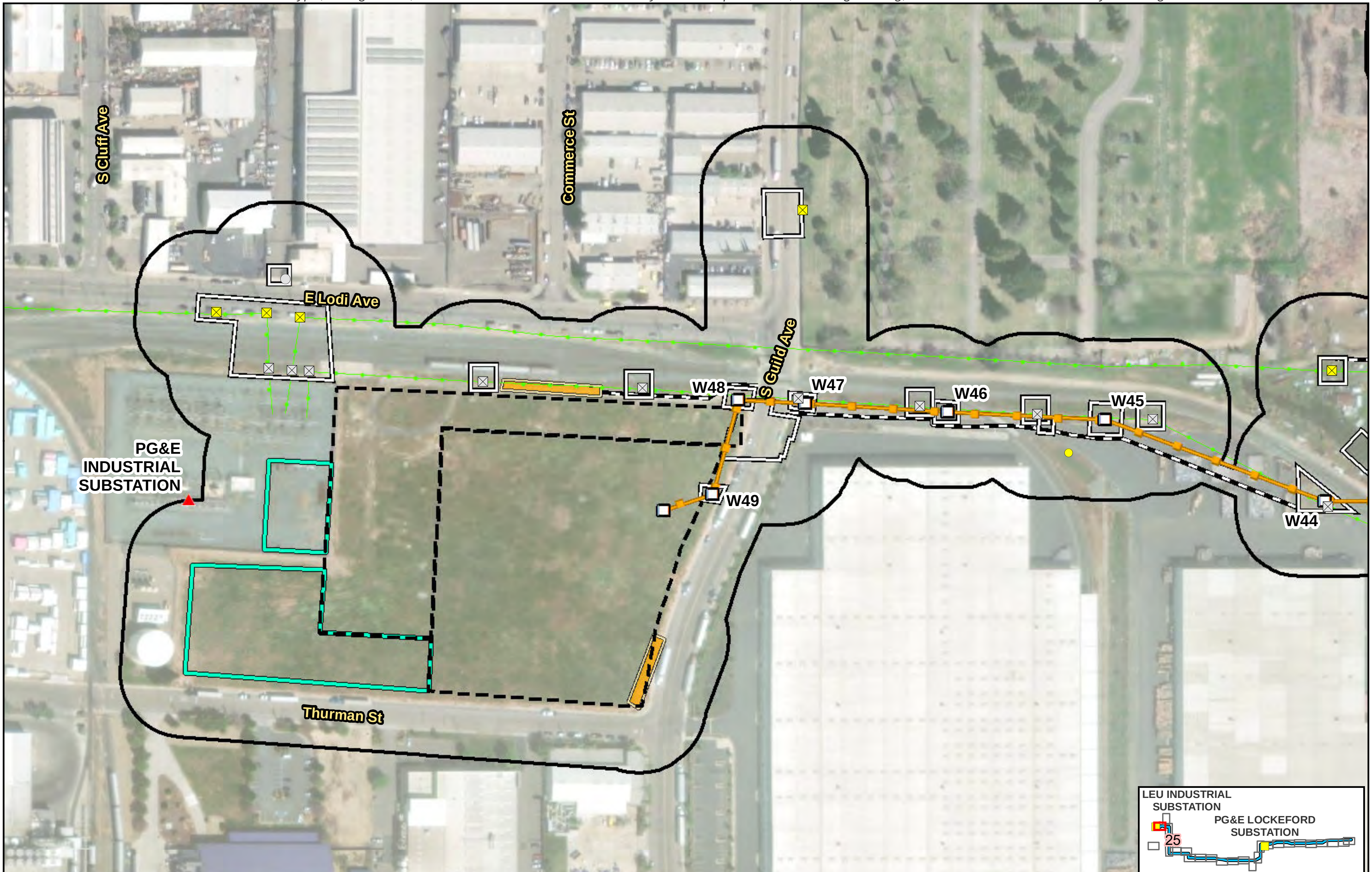

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- Proposed Staging Area
- Culvert

Source:
1) Esri World Imagery

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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 25 of 26
Northern San Joaquin 230 kV Transmission Project

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Source:
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Scale: 1:3,000

0 100 Feet

FIGURE 5
Aquatic Resource Delineation
Page 26 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

Appendix A
Field Datasheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV   City/County: San Joaquin County   Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric   State: CA   Sampling Point: SP-1

Investigator(s): M. Marek, R. Huddleston, K. Brown   Section, Township, Range: 10, 03N, 08E

Landform (hillslope, terrace, etc.): tilled vineyard   Local relief (concave, convex, none): none   Slope (%): 0

Subregion (LRR): C - Mediterranean California   Lat: 38.121660798141   Long: -121.095032448886   Datum: NAD 83

Soil Map Unit Name: Cometa sandy loam 2 to 5 percent slopes   NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-1 is in heavily tilled area within a vineyard. Location of sample point has not been planted with vines, possibly an area that historically got wet or conveyed surface flow.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Hordeum marinum*	25	Yes	FAC
2. *Polypogon monspeliensis*	5	No	FACW
3. *Briza minor*	2	No	FAC
4. *Festuca perennis*	3	No	Not Listed
5. *Epilobium sp.*	1	No	
6. *Centromadia fitchii*	25	Yes	FACU
7. *Lupinus bicolor*	1	No	Not Listed
8.			
Total Cover:	62 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 50 %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	5	x 2 =	10
FAC species	27	x 3 =	81
FACU species	25	x 4 =	100
UPL species	4	x 5 =	20
Column Totals:	61 (A)		211 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	10YR 3/4	97	7.5YR 4/6	3	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ **No** ◉

Remarks: Top 6 inches of soil has been tilled

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Not a well defined depression. appears periodically wetted on aerial imagery, but not clearly inundated.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV | City/County: San Joaquin County | Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric | State: CA | Sampling Point: SP-2a

Investigator(s): M. Marek, R. Huddleston, K. Brown | Section, Township, Range: 9, 03N, 08E

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): C - Mediterranean California | Lat: | Long: | Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam 2 to 5 percent slopes | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? **Yes** ◉ **No** ○

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-2a is a shallow depression along the proposed access route.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Hordeum marinum*	80	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 50 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	80	x 3 =	240
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	80 (A)		240 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

Remarks:

SOIL

Sampling Point: SP-2a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 4/2	100					sandy loam	
3-6	10YR 4/2	95	5YR 4/6	5	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks: Soils appear only marginally hydric, redox features faint. Soils were compacted and hard, difficult to dig below 6".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Inundation only faint on aerial imagery,never appears ponded, but wetter vegetation signature.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-2b

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 8, 03N, 08E

Landform (hillslope, terrace, etc.): flat uplands Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-2b is an upland point outside of SW-1.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	40	Yes	FACU
2. *Bromus diandrus*	40	Yes	Not Listed
3. *Hordeum marinum*	2	No	FAC
4.			
5.			
6.			
7. *L*			
8.			
Total Cover:	82 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	2	x 3 =	6
FACU species	40	x 4 =	160
UPL species	40	x 5 =	200
Column Totals:	82 (A)		366 (B)

Prevalence Index = B/A = 4.46

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: SP-2b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 4/2	100					sandy clay loam	
3-6	10YR 4/2	95	5YR 3/4	5	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [x] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks: Top

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ( ) No (●) Depth (inches):

Water Table Present? Yes ( ) No (●) Depth (inches):

Saturation Present? (includes capillary fringe) Yes ( ) No (●) Depth (inches):

Wetland Hydrology Present? Yes ( ) **No** (●)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV | City/County: San Joaquin County | Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric | State: CA | Sampling Point: SP-3a

Investigator(s): M. Marek, R. Huddleston, K. Brown | Section, Township, Range: 8, 03N, 08E

Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): C - Mediterranean California | Lat: | Long: | Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam | NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-2b is an upland point outside of SW-1.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	15	No	FACU
2. *Epilobium brachycarpum*	15	No	FAC
3. *Hordeum marinum*	30	Yes	FAC
4. *Mimulus guttatus*	1	No	OBL
5. *Festuca perennis*	7	No	Not Listed
6. *Rumex crispus*	2	No	FAC
7.			
8.			
Total Cover:	70 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species		x 2 =	0
FAC species	47	x 3 =	141
FACU species	15	x 4 =	60
UPL species	7	x 5 =	35
Column Totals:	70 (A)		237 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: SP-3a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-6	10YR 4/2	95	5YR 4/6	9	C	M	sandy loam	
6-8	7.5YR 4/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Top

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Feature is part of a swale complex that appears periodically mesic, and slightly more mesic than surrounding uplands in this dry year.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-3b

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 9, 03N, 08E

Landform (hillslope, terrace, etc.): gently sloping upland Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	40	Yes	FACU
2. *Bromus diandrus*	40	Yes	Not Listed
3. *Hordeum marinum*	5	No	FAC
4.			
5.			
6.			
7. *L*			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	5	x 3 =	15
FACU species	40	x 4 =	160
UPL species	40	x 5 =	200
Column Totals:	85 (A)		375 (B)

Prevalence Index = B/A = 4.41

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: SP-3b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-6	7.5YR 4/3	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Top

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-4a

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 9, 03N, 08E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam 2to 5 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐

Is the Sampled Area within a Wetland? Yes ☒ No ☐

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. Shallow depressional feature, likely connected to swale complex during wetter years.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Hordeum marinum*	30	Yes	FAC
2. *Deschampsia danthonioides*	7	No	FACW
3. *Centromadia fitchii*	7	No	FACU
4. *Plagiobothrys sp.*	5	No	FACW
5. *Rumex crispus*	1	No	FAC
6.			
7.			
8.			
Total Cover:	50 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 50 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	12	x 2 =	24
FAC species	31	x 3 =	93
FACU species	7	x 4 =	28
UPL species		x 5 =	0
Column Totals:	50 (A)		145 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-4a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	10YR 4/3	100					loam	
2-6	7.5YR 4/3	95	5YR 4/6	5	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Hard compacted soil difficult to dig below 6"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☒ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):
Water Table Present? Yes ○ No ◉ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Silty sediment deposit observed on the soil surface

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-4b

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 9, 03N, 08E

Landform (hillslope, terrace, etc.): flat upland Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam 2 to 5 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ● (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ●
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ○	No ●

Is the Sampled Area within a Wetland? Yes ○ No ●

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. Grassy uplands around seasonally mesic swale complex

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus hordeaceus*	30	Yes	FACU
2. *Centromadia fitchii*	5	No	FACU
3. *Festuca perennis*	2	No	Not Listed
4.			
5.			
6.			
7. *L*			
8.			
Total Cover:	37 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	35	x 4 =	140
UPL species	2	x 5 =	10
Column Totals:	37	(A)	150 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ●

Remarks:

SOIL

Sampling Point: SP-4b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	7.5YR 4/2	100					sandy loam	
2-6	7.5YR 4/3	98	5YR 3/4	2	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks: hard, compacted soil made difficult to dig below 6"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-1x

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 7, 03N, 08E

Landform (hillslope, terrace, etc.): flat tilled Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.1196181217077 Long: -121.135745681129 Datum: NAD 83

Soil Map Unit Name: Rocklin fine sandy loam 0 to 2 percent slopes NWI classification: PUBFx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ● (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	●
Hydric Soil Present?	○	●
Wetland Hydrology Present?	○	●

Is the Sampled Area within a Wetland? Yes ○ No ●

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-1x is intended to document the absence of aquatic resources, as mapped by NWI. Area has been converted to agriculture.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Polygonum aviculare*	2	Yes	FAC
2. *Erigeron canadensis*	2	Yes	FACU
3. *Festuca perennis*	2	Yes	Not Listed
4. *Bromus diandrus*	2	Yes	Not Listed
5.			
6.			
7.			
8.			
Total Cover:	8 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 95 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	25.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	2	x 3 =	6
FACU species	2	x 4 =	8
UPL species	4	x 5 =	20
Column Totals:	8 (A)		34 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ●

Remarks:

SOIL

Sampling Point: SP-1x

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3"	7.5YR 3/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Soils too compacted to dig

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV | City/County: San Joaquin County | Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric | State: CA | Sampling Point: SP-2x

Investigator(s): M. Marek, R. Huddleston, K. Brown | Section, Township, Range: 8, 03N, 08E

Landform (hillslope, terrace, etc.): | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.119096 | Long: -121.131896 | Datum: NAD 83

Soil Map Unit Name: Rocklin sandy loam 2 to 5 percent slopes | NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	◉	○
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-2x was collected to document the absence of aquatic resources, as mapped by NWI. Area has been converted to vineyard. Some ponded water in the vicinity, though the area is irrigated.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Cynodon dactylon*	50	Yes	FACU
2. *Cyperus eragrostis*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60 %		
Woody Vine Stratum			
1. *Vitis vinifera*	35	Yes	Not Listed
2.			
Total Cover:	35 %		

% Bare Ground in Herb Stratum 75 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	10	x 2 =	20
FAC species		x 3 =	0
FACU species	50	x 4 =	200
UPL species	35	x 5 =	175
Column Totals:	95 (A)		395 (B)

Prevalence Index = B/A = 4.16

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: SP-2x

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	7.5YR 3/3	97	5YR 5/8	3	C	M	sandy loam	
3-6	7.5YR 4/3	50	5YR 4/6	50	C	M	sandy loam	
6-12	10YR 4/2	40	5YR 4/6	60	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: unclear if redox may be the result of irrigation ponding

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV | City/County: San Joaquin County | Sampling Date: 4/28/2021

Applicant/Owner: Pacific Gas and Electric | State: CA | Sampling Point: SP-3x

Investigator(s): M. Marek, R. Huddleston, K. Brown | Section, Township, Range: 8, 03N, 08E

Landform (hillslope, terrace, etc.): flat tilled upland | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.119303 | Long: -121.127646 | Datum: NAD 83

Soil Map Unit Name: Rocklin sandy loam 2 to 5 percent slopes | NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-3x collected to demonstrate lack of aquatic resources at location of NWI feature. Collected adjacent to vineyard in grassy area.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Avena barbata*	5	No	Not Listed
2. *Festuca perennis*	3	No	Not Listed
3. *Festuca myuros*	60	Yes	Not Listed
4. *Hordeum murinum*	15	Yes	FACU
5.			
6.			
7.			
8.			
Total Cover:	83 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 25 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	15	x 4 =	60
UPL species	68	x 5 =	340
Column Totals:	83	(A)	400 (B)

Prevalence Index = B/A = 4.82

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: SP-3x

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 3/4						sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Soul too compacted to dig below 3"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of hydrology.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV | City/County: San Joaquin County | Sampling Date: 4/28/2021

Applicant/Owner: Pacific Gas and Electric | State: CA | Sampling Point: SP-4x

Investigator(s): M. Marek, R. Huddleston, K. Brown | Section, Township, Range: 10, 03N, 08E

Landform (hillslope, terrace, etc.): flat access road | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.120066 | Long: -121.096450 | Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam 2 to 5 percent slopes | NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ● (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ●
Hydric Soil Present?	Yes ○	No ●
Wetland Hydrology Present?	Yes ○	No ●

Is the Sampled Area within a Wetland? Yes ○ No ●

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-4x collected to demonstrate lack of aquatic resources at location of mapped NWI feature. Area has been bermed and has a fenceline through it.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Erigeron canadensis*	3	Yes	FACU
2. *Croton setiger*	3	Yes	
3. *Erigeron bonariensis*	3	Yes	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	9 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 90 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	6	x 4 =	24
UPL species		x 5 =	0
Column Totals:	6	(A)	24 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ●

Remarks:

SOIL

Sampling Point: SP-4x

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	7.5YR 3/4	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indication of recent hydrology

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Northern San Joaquin 230 kV City/County: San Joaquin County Sampling Date: 4/27/2021

Applicant/Owner: Pacific Gas and Electric State: CA Sampling Point: SP-5x

Investigator(s): M. Marek, R. Huddleston, K. Brown Section, Township, Range: 10, 03N, 08E

Landform (hillslope, terrace, etc.): tilled vineyard Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.121521 Long: -121.095800 Datum: NAD 83

Soil Map Unit Name: San Joaquin sandy loam 2 to 5 percent slopes NWI classification: PUBFx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◯ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ◯

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◯	No ◉
Hydric Soil Present?	Yes ◯	No ◉
Wetland Hydrology Present?	Yes ◯	No ◉

Is the Sampled Area within a Wetland? Yes ◯ No ◉

Remarks: 2020-2021 precipitation was lower than average. This would not have impacted the results of the delineation. SP-5x collected to document the lack of aquatic resources at the location of mapped NWI feature. Has been converted to vineyard that is heavily tilled.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bromus diandrus*	20	Yes	Not Listed
2. *Vitis vinifera*	30	Yes	Not Listed
3. *Lysimachia arvensis*	1	No	Not Listed
4. *Erigeron sp.*	1	No	
5.			
6.			
7.			
8.			
Total Cover:	52 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 50 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	51	x 5 =	255
Column Totals:	51	(A)	255 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◯ No ◉

Remarks:

SOIL

Sampling Point: SP-5x

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-5	7.5YR 3/4	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indication of recent hydrology

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: NSJ 230 KV **Project Number:** **Stream:** CW-1 **Investigator(s):** M Marek, S. Owens	**Date:** 5/11/21 **Time:** 2:00 PM **Town:** Victor **State:** CA **Photo begin file#:** **Photo end file#:**
Y ☑ / N ☐ Do normal circumstances exist on the site?	**Location Details:**
Y ☐ / N ☑ Is the site significantly disturbed?	**Projection:** **Datum:** **Coordinates:**

Potential anthropogenic influences on the channel system:
Constructed / realigned channel between 2 parcels. lined w/ landscaped plants. Bermed on south side

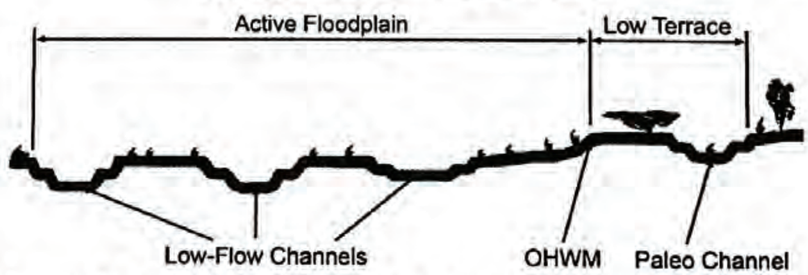
Brief site description: Realigned drainage, perennial, 6-12" deep culvert inlet

Checklist of resources (if available):

- ☑ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

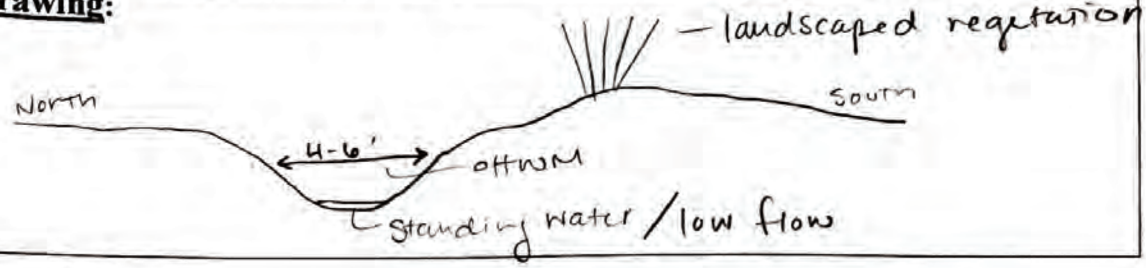


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☑ GPS
   - ☐ Other:

oject ID: NSJ **Cross section ID:** T-1 **Date:** 5/11/21 **Time:** 2:00PM

Cross section drawing:



OHWM

GPS point: CW-1

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Excavated, channelized.

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: CW-1

Characteristics of the floodplain unit:

Average sediment texture: Water - could not be determined

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: 10 %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: NSJ 230 KV **Project Number:** **Stream:** NW-1 (Paddy Creek) **Investigator(s):** M. Marek, S. Owens	**Date:** 5/11/2021 **Time:** 2:30 PM **Town:** Victor **State:** CA **Photo begin file#:** **Photo end file#:**
Y ☑ / N ☐ Do normal circumstances exist on the site?	**Location Details:**
Y ☐ / N ☑ Is the site significantly disturbed?	**Projection:** **Datum:** **Coordinates:**

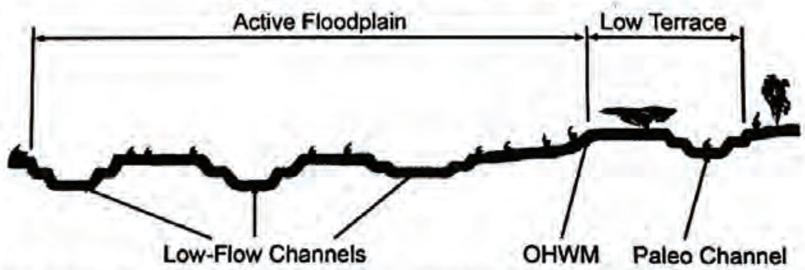
Potential anthropogenic influences on the channel system:
Paddy creek is excavated in places, & has been diverted for irrigation in areas. Abutted by levees w/in the BSA

Brief site description:
Dry during survey. Dominated by sedges & some bulrush. Sandy substrate

Checklist of resources (if available):

- ☑ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

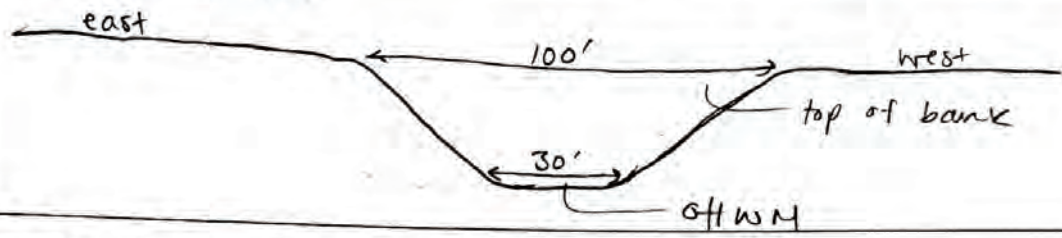


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☑ GPS
   - ☐ Other:

Project ID: NSJ **Cross section ID:** T- 2 **Date:** 5/11/21 **Time:** 2:30PM

Cross section drawing:



OHWM

GPS point: NW-1

Indicators:

- [ ] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____
- [ ] Other: ____

Comments:

Excavation / channelization of the feature has established the OHWM

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: NW-1

Characteristics of the floodplain unit:

Average sediment texture: Sandy loam

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: 35 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [x] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____
- [ ] Other: ____
- [ ] Other: ____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: NSJ 230 kV
Project Number:
Stream: CW-2
Investigator(s): M. Marek, S. Owens

Date: 4/28/21
Town: Victor
Photo begin file#:

Time: 10:00 am
State: CA
Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:

Projection:
Datum:
Coordinates:

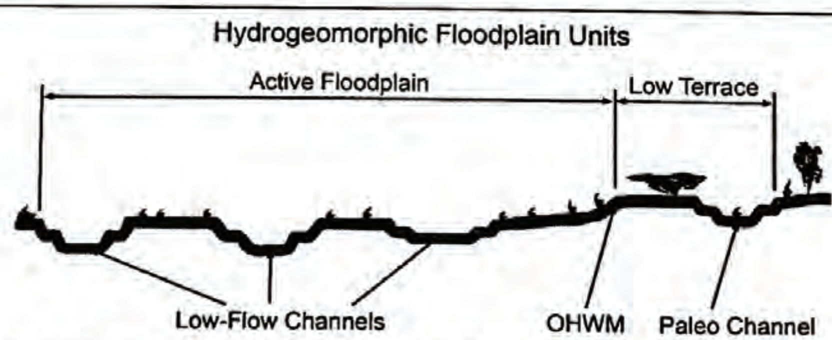
Potential anthropogenic influences on the channel system:
Channelized / realigned feature between cropped parcel & mowed parcel

Brief site description:
perennial feature but only marginally wet this year. could possibly be considered intermittent. Flows south to PaddyC

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event



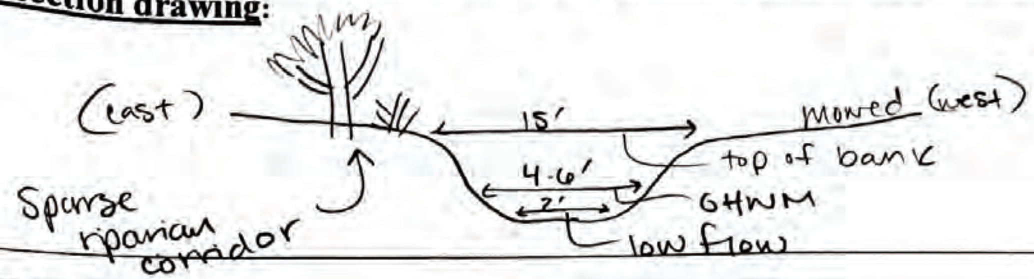
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other:

Project ID: NSU **Cross section ID:** T-3 **Date:** 4/28/21 **Time:** 10:00 AM

Cross section drawing:



OHWM

GPS point: CW-2

Indicators:

- [ ] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

constructed/realigned nature of the channel established the OHWM

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: CW-2

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: 15 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

flattened, dead veg in low flow. Some small areas of pooled / standing water

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: NSJ - 230 KV **Project Number:** **Stream:** NW-2 (Bear creek) **Investigator(s):** M. Mark, K. Brown	**Date:** 5/11/21 **Town:** Victor **Photo begin file#:**	**Time:** 12:00 PM **State:** CA **Photo end file#:**
Y ☑ / N ☐ Do normal circumstances exist on the site?	**Location Details:**	
Y ☐ / N ☑ Is the site significantly disturbed?	**Projection:** **Coordinates:**	**Datum:**

Potential anthropogenic influences on the channel system:
Excavated / channelized in areas. Bounded by levees. Diverted for irrigation in areas

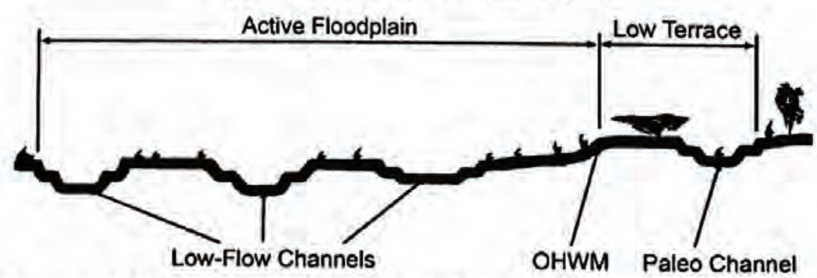
Brief site description:

Checklist of resources (if available):

- ☑ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☑ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☑ Stream gage data
  Gage number: USGS 11312000
  Period of record: 1930 - 1985
  - ☑ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

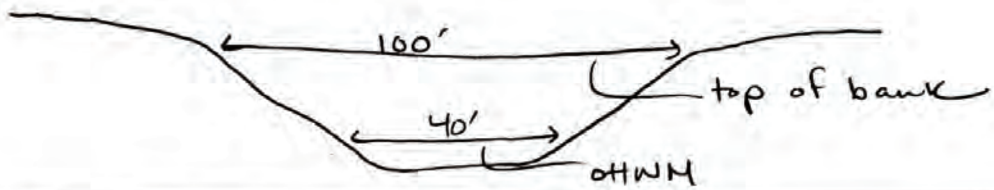


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☑ GPS
   - ☐ Other:

Project ID: NSJ **Cross section ID:** T-4 **Date:** 5/11/21 **Time:** 12:00PM

Cross section drawing:



OHWM

GPS point: NW-2

Indicators:

- ☑ Change in average sediment texture
- ☑ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: ______
- ☐ Other: ______

Comments:

Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: NW-2

Characteristics of the floodplain unit:

Average sediment texture: Sandy

Total veg cover: ____ % Tree: ↓ % Shrub: ____ % Herb: 40 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☑ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ______
- ☐ Other: ______
- ☐ Other: ______

Comments:

Scanned with CamScanner

Appendix B
Representative Site Photographs

Photo 1. Representative photo of a seasonal, depressional wetland (SW-2) within the biological study area (BSA), facing east; April 27, 2021.

Photo 2. Seasonal wetland (SW-8) adjacent to access road within the BSA, facing north; April 27, 2021.

Photo 3. Paddy Creek where it passes through the BSA, facing southwest; May 11, 2021.

Photo 4. Bear Creek where it passes through the BSA, facing northeast; April 28, 2021.

Photo 5. Constructed watercourse CW-1, where it passes through the BSA, facing east; May 11, 2021.

Photo 6. Constructed watercourse CW-2, east of PG&E Lockeford Substation, facing south; April 28, 2021.

Photo 7. Constructed watercourse CW-3, where it passes through the BSA, facing east; April 28, 2021.

Photo 8. Representative drainage ditch within the BSA (DD-3), facing south; April 27, 2021.

Appendix C3
Northern San Joaquin 230 kV Transmission Project Biological Resources Technical Memorandum

Jacobs

Memorandum

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Subject	Biological Resources Technical Memorandum for the Pacific Gas and Electric Company Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California
Project Name	Northern San Joaquin 230 kV Transmission Project
Attention	Andi Henke/Pacific Gas and Electric Company; Erin Rice/Pacific Gas and Electric Company
From	Stephanie Owens/Jacobs; Mia Marek/Jacobs
Date	August 2023
Copies to	David Rasmussen/Jacobs; Colleen Taylor/Jacobs

1. Introduction

This memorandum discusses biological resources for the proposed Pacific Gas and Electric Company (PG&E) Northern San Joaquin 230 kilovolt (kV) Transmission Project (project) to provide a new 230 kV transmission system in northern San Joaquin County in central California (Figure 1; figures are presented at the end of this memorandum). The purpose of the project is to increase electric reliability and accommodate forecasted load growth to electrical customers in northern San Joaquin County. The project includes activities by PG&E and the City of Lodi's Electric Utility (Lodi Electrical Utility or LEU). This project description summary includes PG&E's portion of the project and LEU's portion of the project. This memorandum references PG&E's portion of the project or LEU's portion of the project in select sections. Refer to PG&E's project Proponent's Environmental Assessment for potential impact discussion by utility. The proposed project is within unincorporated areas of northeastern San Joaquin County and partially within an industrial area of the City of Lodi (Figure 1). Within the City of Lodi, the *City of Lodi General Plan* land use designation and zoning is industrial with industrial and commercial business and associated railroad lines on adjacent parcels. Major geographic features in the vicinity of the project include the Mokelumne River, Bear Creek, State Route (SR) 12, SR 88, and SR 99.

The project will loop PG&E's existing overhead Brighton-Bellota 230 kV transmission line through PG&E Lockeford Substation and install a new overhead double-circuit 230 kV transmission line between PG&E Lockeford Substation and the new PG&E Thurman Switching Station at Lodi Electric Utility's (LEU's) Fred M. Reid Industrial Substation (LEU Industrial Substation) in Lodi, California. LEU will construct the new 230/60 kV Guild Substation between LEU Industrial Substation and PG&E Thurman Switching Station. At LEU Guild Substation, the new 230 kV transmission line will terminate, and transformers will step down the power to 60 kV and connect with LEU Industrial Substation. When the new 230 kV system is operating, the existing local PG&E 60 kV system will be reconfigured, including disconnecting from LEU's 60 kV system at LEU Industrial Substation. The 60 kV lines will be removed or reconfigured within their existing alignments.

PG&E will perform project-related work at four remote-end substations (Brighton, Bellota, Rio Oso, and Lodi), which are located in Folsom, Linden, Rio Oso, and Lodi, respectively, to update the system protection scheme.

The proposed project includes new or modified aboveground substations; a switching station; microwave towers; Federal Communications Commission towers; and transmission, power, distribution/feeder, and telecommunication (optical ground and shield wires) lines. Belowground facilities, or portions thereof, include new and modified foundations, grounding grids, new and relocated 12 kV feeder lines, and telecommunication circuits at stations. Project activities will occur within new and existing right-of-way, along new proposed and existing access roads, and on PG&E property. Construction work areas and access roads will occur within existing, modified, or new rights-of-way with some adjacent or nearby temporary construction work areas and access.

The proposed new Northern San Joaquin 230 kV transmission line begins at new PG&E tubular steel pole (structure) E1 and continues west to LEU Industrial Substation (Figure 2). The regional topography generally is flat with rolling hills increasing to the east. Elevation ranges from approximately 135 feet above sea level at the eastern end of the project to approximately 60 feet above sea level at the western end of the project. The majority of upland habitat observed throughout the vicinity of the project is either hardscaped (pavement and sidewalks) or otherwise developed/landscaped areas, agriculture, or is disturbed habitat consisting of primarily ruderal or non-native species.

This report will discuss the areas that will be affected by this project and immediately adjacent areas, along with the potential for special-status plant and wildlife species to occur and proximity to waters that are potentially jurisdictional under the Clean Water Act (CWA) and California Fish and Game Code (CFGC).

No resource agency consultations have occurred for this project.

2. Methods

Biological resources in the project area (defined here as the areas that will be disturbed by project activities), including the work areas, pull sites, and unpaved access roads, were characterized by reviewing existing information and conducting reconnaissance-level field surveys of botanical, wetlands, and wildlife resources. Reconnaissance-level surveys were conducted within the biological study area (BSA) corridor by Jacobs biologists Kyle Brown and Mia Marek on December 11, 2019. Rare plant surveys were conducted within the BSA corridor by Jacobs biologists Mia Marek, Kyle Brown, and Stephanie Owens and ATS biologist Russell Huddleston on April 27 and 28, May 11, June 15, and August 6, 2021. An aquatic resource delineation was conducted by biologists Mia Marek, Kyle Brown, Stephanie Owens, and Russell Huddleston on April 27 and 28 and May 11, 2021. A follow up biological reconnaissance survey was conducted on August 11, 2022, by Jacobs biologists Mia Marek and Stephanie Owens to assess the BSA where it was expanded to encompass additional proposed work areas associated with pole replacements along the PG&E Lockeford-Industrial 60 kV Line, PG&E Lodi-Industrial 60 kV Line, PG&E Industrial Tap 60 kV Line, and PG&E Lockeford-Lodi No. 2 60 kV power line. The purpose of these surveys was to identify potential habitat for special-status species and to field-verify the mapped vegetation types and wetland features that were identified in online database searches. Prior to conducting the surveys, the following biological databases and aerial imagery were reviewed to identify locations within the BSA that might have substrates or habitats suitable for special-status plant species:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2023)

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) System (USFWS 2023a)
- USFWS Critical Habitat Mapper (USFWS 2022b)
- California Native Plant Society (CNPS) online version of the *Inventory of Rare and Endangered Plants of California* (CNPS 2023)
- CNPS Calflora Database (Calflora 2022)
- National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) federally listed and proposed endangered, threatened, and candidate species and their designated critical habitat (NMFS 2023)
- National Wetlands Inventory (USFWS 2022c)
- U.S. Geological Survey (USGS) National Hydrography Dataset (USGS 2022)

A CNDDB and CNPS search for special-status species typically includes nine U.S. Geological Survey (USGS) 7.5-minute quadrangle maps for a project located within a single quadrangle—the quadrangle that covers the project footprint, and the eight quadrangles that surround the project quadrangle. However, in this case, the project footprint spanned four quadrangles; therefore, the CNDDB and CNPS species lists were generated for additional quadrangles to account for all the areas surrounding the four project quadrangles, including Linden, Lockeford, Waterloo, Lodi North, Clay, Goose Creek, Clements, Wallace, Valley Springs SW, Farmington, Peters, Stockton East, Stockton West, Lodi South, Galt, Bruceville, Thornton, and Terminous. The CNDDB search was further refined to a 5-mile buffer around the project footprint. The USFWS IPaC Species list was generated for the project BSA. The NMFS species list was generated for the Linden, Waterloo, and Lodi North quadrangles.

Based on California Public Utilities Commission guidelines, the BSA should include a 1,000-foot-wide buffer from project facilities; however, the BSA in this report includes a 250-foot-wide buffer around the proposed transmission line and all potential work areas (including new proposed structure locations, staging areas, and new proposed substations), and a 50-foot-wide buffer around proposed unpaved access roads (Figure 2). The BSA was reduced in size for the following reasons:

- There is constrained access because of surrounding private property along the project's right-of-way.
- The majority of the alignment will have no or very limited ground-disturbing activities.
- The majority of the BSA is either hardscaped (pavement and sidewalks) or otherwise developed/ landscaped, agriculture, or disturbed habitat.
- The surrounding areas generally are flat, which limits the potential for runoff to adjacent areas and associated indirect impacts, and the project area will be restored to preproject conditions.

Direct and indirect effects are not anticipated outside of the BSA. The BSA encompasses approximately 387 acres.

Biological reconnaissance surveys entailed conducting windshield surveys in developed areas, walking meandering transects in accessible undeveloped portions of the BSA, and surveying areas that have potential to support habitat for special-status species as identified in desktop-level reviews. Focused early-season and late-season rare plant surveys were conducted in habitats that were potentially suitable for special-status species within the BSA. An aquatic resource delineation was conducted to determine aquatic features in the BSA that are potentially jurisdictional.

The following sections describe existing biotic communities and discuss sensitive habitats and special-status plant and wildlife species with potential to occur in the BSA.

Special-status plant species were defined in accordance with Section 15380 of the California Environmental Quality Act (CEQA) Guidelines and the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018), and include species that meet the following criteria:

- Are federally or state-listed, or are proposed for listing as rare, threatened, or endangered
- Are Special Plants as defined by the CNDDB
- Are listed by the CNPS in the online version of its *Inventory of Rare, Threatened, and Endangered Plants of California*; List 1, 2, 3, and 4 species

Special-status wildlife species were defined in accordance with Section 15380 of the CEQA Guidelines and include species that meet one or more of the following criteria:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act (FESA)
- Listed or candidate for listing as threatened or endangered under the California Endangered Species Act (CESA)
- Designated as a Species of Special Concern (SSC) or a Fully Protected (FP) species by the CDFW
- Listed on the CDFW "Special Animals" list; or otherwise meet the definition of rare, threatened, or endangered as described in the CEQA Guidelines, Section 15380

Bird species protected under the federal Bald and Golden Eagle Protection Act and bat species considered by the Western Bat Working Group to be high or medium priority (Western Bat Working Group 2017) were also considered and were considered special-status where they met criteria as listed above.

3. Results

The results from the reconnaissance-level survey, rare plant surveys, and aquatic resources delineation are discussed in this section. Habitat, potential for special-status species, and presence of water features that are potentially jurisdictional under the CWA and CFGC are discussed in the following sections for the proposed work at these locations.

Suitable nesting habitat for migratory birds is found within and around the project area of existing substations and transmission line routes, new substation/switching station and transmission line routes, access routes, and staging areas; as a result, migratory birds will not be discussed individually for each project component. For further information on special-status species with potential to occur in the BSA, refer to Table 1, Special-Status Plant Species, in Section 3.3.1, and Table 2, Special-Status Wildlife Species, in Section 3.3.2. Attachment A presents a full list of special-status species and their potential to occur in the BSA. Database records search results from CDFW, CNPS, USFWS, and NMFS are included in Attachment B.

3.1 Vegetation and Land Cover Types

The majority of upland habitat observed throughout the BSA is either hardscaped (pavement and sidewalks) or otherwise developed/landscaped, is agricultural land, or is disturbed habitat consisting of primarily ruderal or non-native species. Table 1 shows the distribution of landcover within the BSA.

Representative vegetation alliances from the *Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) are referenced and discussed in the following sections and shown within the BSA on Figure 3. No sensitive vegetation communities or habitats identified in local plans, policies, or regulations, or as designated by CDFW or USFWS, are present within the BSA.

Table 1. Land Cover within the BSA

Land Cover	Acres within BSA
Tree Cover	1.97
Other Waters	1.38
Wetlands	0.20
Riparian	0.90
Grassland	59.35
Agriculture	264.53
Ruderal	2.44
Developed/Disturbed	56.28
Total	387.06

3.1.1 Tree Cover

Tree cover is not included in the following description sections because this land cover type does not correlate with representative vegetation alliances from the *Manual of California Vegetation, Second Edition*. However, this land cover type is included on Figure 3, pages 3 and 7. Tree cover, where mapped, includes planted, ornamental, or landscaped overstory trees that are not associated with agricultural land cover types. There is potential that trees will need to be trimmed or removed to facilitate the project. Locations of these trees are shown on Figure 3 (pages 2, 3, 5, 6, 9, 10, 11, 13, 14, and 17).

3.1.2 Wetlands

Eight depressional seasonal wetlands were delineated within the BSA along the proposed PG&E 230 kV transmission line. Vegetation within the wetlands consisted of seaside barley (*Hordeum marinum*), sparse popcornflower (*Plagiobothrys* sp.), annual hairgrass (*Deschampsia danthonioides*), spikerush (*Eleocharis* sp.), and tall flatsedge (*Cyperus eragrostis*). More details on these wetlands can be found in Section 3.2.

3.1.3 Other Waters

Open water within the BSA includes natural watercourses such as Bear Creek and Paddy Creek, constructed watercourses, and drainage and irrigation ditches. Where emergent vegetation exists, the predominant natural plant communities are *Schoenoplectus* (*acutus*, *californicus*) Herbaceous Alliance (hardstem and California bulrush marshes), *Juncus* (*oxymeris, xiphioides*) Provisional Herbaceous Alliance (irisleaf rush seeps), and *Lolium perenne* Herbaceous Semi-Natural Alliance (perennial rye grass fields). Vegetation within the creeks and along the creek banks is variable, but predominantly includes species such as bulrush (*Schoenoplectus* ssp.), perennial ryegrass (*Festuca perennis* [*Lolium perenne*]), irisleaf rush (*Juncus xiphioides*), and curly dock (*Rumex crispus*). More details on these aquatic features can be found in Section 3.2.

3.1.4 Riparian

Sparse riparian vegetation occurs along the banks of Bear Creek, Paddy Creek, and a realigned tributary to Paddy Creek, where these features bisect the proposed PG&E 230 kV transmission line. Figure 3 depicts riparian habitat associated with the riverine features within the BSA. In general, the riparian corridors within the BSA are narrow, confined by steep slopes, and sparsely vegetated. Riparian vegetation within the BSA consists mostly of non-native grasses, sparse willows (*Salix* ssp.) along Bear Creek and Paddy Creek, and a few small oaks (*Quercus agrifolia*) and black walnut trees (*Juglans* sp.) along the realigned tributary to Paddy Creek. These narrow riparian areas provide only very marginal-quality riparian corridors for terrestrial wildlife movement.

3.1.5 Grassland

Annual grasslands occur throughout the BSA, in pastures, along roadsides, and in other undeveloped, disturbed areas. Annual grassland can most readily be classified as annual brome grasslands within the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Herbaceous Semi-Natural Alliance or *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance, or else the *Lolium perenne* (*Festuca perennis*) Herbaceous Semi-Natural Alliance (perennial rye grass fields). Where these alliances occur, rip-gut brome (*Bromus diandrus*), seaside barley, foxtail barley (*Hordeum murinum*), soft chess (*Bromus hordeaceus*), and perennial ryegrass are dominant or co-dominant with other non-natives such as black mustard (*Brassica nigra*), fennel (*Foeniculum vulgare*), and bristly ox-tongue (*Helminthotheca echioides*) in the herbaceous layer. Additionally, *Brassica nigra* – *Centaurea* (*solstitialis*, *melitensis*) Herbaceous Semi-Natural Alliance occurs within annual grasslands in low cover, most commonly near roadsides and other developed areas.

3.1.6 Agriculture

Agricultural monocultures of almond, cherry, and peach (*Prunus* spp.), as well as walnuts (*Juglans* spp.), vineyards, and corn (*Zea mays*) were dominant in the developed agricultural land throughout the BSA.

3.1.7 Ruderal

Ruderal habitat is common in highly disturbed areas, including along roadways, at the edges of hardscape development, and at other infrastructure areas such as levees and railroads. Ruderal habitat is characterized by a lack of vegetation or is dominated by non-native or invasive plant species such as Italian thistle (*Carduus* spp.), yellow starthistle (*Centaurea solstitialis*), black mustard, foxtail barley, filaree (*Erodium botrys*), perennial pepperweed (*Lepidium latifolium*), and stinkwort (*Dittrichia graveolens*) among others.

Brassica nigra – *Centaurea* (*solstitialis*, *melitensis*) Herbaceous Semi-Natural Alliance (upland mustards or starthistle fields) also is prevalent around the ruderal margins of the concrete hardscapes along creek banks and levees.

3.1.8 Developed/Disturbed

Developed areas include existing paved roadways and parking lots; railroad areas; residential, commercial, and industrial development; and areas where vegetation is regularly cleared. These areas lack vegetation entirely or have only scattered weedy grasses and forbs. The developed area also includes a portion of the Lodi Memorial Park and Cemetery located northeast of the intersection of East Lodi Avenue and South Guild Avenue that consists of gravestones, mowed grass, and a large stand of trees. The cemetery is bordered by a fence.

3.2 Potentially Jurisdictional Wetland and Water Features

There are potentially jurisdictional areas under the CWA and CFGC within the BSA (Figure 4). There are approximately 0.200 acre of seasonal wetlands (eight wetlands), approximately 0.247 acre (approximately 359 linear feet) of natural watercourses (one perennial and one intermittent stream), approximately 0.545 acre (approximately 2,775 linear feet) of constructed watercourses, approximately 0.127 acre (approximately 1,805 linear feet) of drainage ditches, and approximately 0.152 acre (approximately 1,654 linear feet) of irrigation ditch in the BSA. The irrigation ditch that runs parallel to the access route and partially intersects the project footprint at PG&E structure W9 was observed during the biological reconnaissance survey on August 11, 2022, at which time it was being used to irrigate a corn crop. The irrigation ditch appears to be seasonally graded and filled, along with the adjacent crop fields, when not in use. The irrigation ditch was not apparent during the 2021 aquatic resource delineation surveys; however, the faint signature of the ditch is intermittently visible in aerial images going back several years (Google Earth 2022). It has no ordinary high water mark and is devoid of vegetation, and as such is presumed to be nonjurisdictional under the CWA and CFGC. While this ditch is presumed to be nonjurisdictional, if it is present during construction, it will be avoided. Placement of this structure will be coordinated with the landowner during final design and construction planning to ensure impacts to this ditch are avoided. There are no potentially jurisdictional wetlands and waters within the project footprint, and none will be impacted. For more information on wetlands and waters within the BSA, refer to the Aquatic Resources Delineation Report (Jacobs 2022).

3.3 Special-Status Species

This section describes special-status species observed (present) during field surveys and any species considered to be likely to occur, that have potential to occur, or that are seasonally present in the BSA. Special-status species that are unlikely to be found in the BSA or otherwise be affected by the project are not discussed in this section and are included in Attachment A.

The CNDDB, CNPS, NMFS, and USFWS database searches identified 71 special-status species within the vicinity of the project, including 39 special-status plant species and 32 special-status wildlife species (Attachment A). There is no designated critical habitat within the vicinity of the project.

3.3.1 Special-Status Plant Species with Potential to Occur

In the CNDDB, USFWS, and CNPS records searches, 39 special-status plant species that could possibly occur within the vicinity of the project were identified. Only two species – succulent owl's-clover (*Castilleja campestris* var. *succulenta*) and Sanford's arrowhead (*Sagittaria sanfordii*) – were determined to have potential to occur in the BSA based on the presence of potentially suitable habitat and known occurrences in the vicinity. Table 1 presents these species and they are described in further detail in the following sections. Neither of these species or other special-status plant species were observed or detected in the project footprint or BSA during the 2021 botanical surveys, and no suitable habitat was observed within the BSA of additional work areas surveyed in August 2022. The remaining species identified from the database queries were determined to be absent because the project footprint (and adjacent areas that may be potentially indirectly impacted) lack suitable habitat, and they were not observed within areas of suitable habitat during appropriately timed botanical surveys within the BSA. A discussion of these species with potential to occur is included in the following paragraphs. Species that are unlikely to occur or are absent are discussed in Attachment A.

Table 2. Special-Status Plant Species with Potential to Occur in the BSA

Scientific Name/ Common Name	Status[a] Federal	State	CNPS	Habitat	Blooming Period	Potential for Occurrence within the BSA
Castilleja campestris var. *succulenta*/ succulent owl's-clover	T	E	1B.2	Usually occurs in wetlands, occasionally occurs in areas that are not wetlands. Habitat is vernal pools (often acidic) with a variety of characteristics, including small and large pools, bowl-shaped pools and swales, shallow and deep pools, and pools with short and long inundation periods. Vegetation communities include valley grassland, foothill grassland, freshwater wetlands, wetland-riparian.	(Mar) Apr-May	Potential to occur. Although there are no CNDDB occurrences within 5 miles of the BSA, a reconnaissance survey conducted in early December of 2019 and an aquatic resources delineation conducted in April and May of 2021 indicated the presence of wetland features in portions of the BSA that could provide suitable habitat for this species. This species was not found within areas of suitable habitat during appropriately timed botanical surveys.
Sagittaria sanfordii/ Sanford's arrowhead	-	-	1B.2	Occurs in wetlands, marshes, and swamps (assorted shallow freshwater). Vegetation communities include freshwater wetlands, wetland-riparian.	May-Oct (Nov)	Potential to occur. Marginally suitable habitat is present in the BSA. There is one CNDDB occurrence within 5 miles of the BSA. This species was not found within areas of suitable habitat during appropriately timed botanical surveys.

[a] Status designations are as follows:

Federal:
T = Threatened

State:
E = Endangered

CNPS California Rare Plant Rank (CRPR):
1B = Rare, threatened, or endangered in California and elsewhere

Threat Rank:
0.2 Fairly threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)

Sources:
USFWS 2023a; CDFW 2023; CNPS 2023

3.3.1.1 Succulent Owl's-Clover

Succulent owl's-clover is federally threatened and state endangered and is a CNPS List 1B.2 species (CNPS 2023). It blooms from March or April through May and is found primarily in vernal pools along the lower foothills of the eastern San Joaquin Valley. However, it can be found in small and large pools, bowl-shaped pools and swales, shallow and deep pools, and pools with short and long inundation periods (CNPS 2023). This species also is found in valley grasslands, foothill grasslands, freshwater wetlands, poorly drained agricultural developments, and wetland-riparian areas.

There is potential for this species to occur within the BSA because there is marginally suitable habitat, including ponded areas in Bear Creek and constructed watercourses and grasslands. There are no CNDDB occurrences within 5 miles of the BSA; however, the reconnaissance survey conducted in early December of 2019 and the aquatic resources delineation conducted in April and May of 2021 indicated the presence of wetland features in portions of the BSA that could provide suitable habitat for this species. Suitable habitat for this species is not present within the project footprint, and it was not observed within areas of suitable habitat within the BSA during appropriately timed botanical surveys, so impacts to this species are not anticipated.

3.3.1.2 Sanford's Arrowhead

Sanford's arrowhead is a CNPS List 1B.2 species that blooms from May through October or November and occurs below elevations of 2,133 feet. It grows in slow-moving or standing freshwater ponds, ditches, wetlands, marshes, swamps, and other assorted shallow freshwater resources (CNPS 2023). This species can be found associated with water plantain (*Alisma plantago-aquatica*), water primrose (*Ludwigia peploides*), and various species of cattail (*Typha* spp.).

There is potential for this species to occur within the BSA because there are marginally suitable freshwater resources, including ponded areas in Bear Creek and constructed watercourses, drainage ditches, and seasonal wetlands. There is one CNDDB occurrence within 5 miles of the BSA, located approximately 0.6 mile northwest of PG&E Lockeford Substation, found in a slough along SR 88 between East Kettleman Lane and SR 12 (Figure 5). However, this species was not observed within areas of suitable habitat within the BSA during appropriately timed botanical surveys, so impacts to this species are not anticipated.

3.3.2 Special-Status Wildlife Species

In the records search, 32 special-status wildlife species were identified. However, suitable habitat for only 7 of the 32 species was identified in the BSA. Table 2 presents these species and they are discussed further in the following sections.

Table 2. Special-Status Wildlife Species

Scientific Name/Common Name	Status[a]			Habitat	Potential for Occurrence within the BSA
	Federal	State	CDFW		
Desmocerus californicus dimorphus/ valley elderberry longhorn beetle	T	-	-	Valley elderberry longhorn beetles are found in riparian habitat only in the vicinity of their host plant, the elderberry (*Sambucus* species).	Potential to occur. The host plant, elderberry (*Sambucus* sp.), exists in the BSA. There are five CNDDB occurrences within 5 miles of the BSA.
Agelaius tricolor/ tricolored blackbird	BCC	T	SSC	Found in areas near water, such as marshes, grasslands, and wetlands. They require some sort of substrate nearby to build nests; this substrate often is aquatic vegetation. They also need foraging areas, which can consist of grassland or agricultural pastures such as rice, grain, or alfalfa.	Potential to occur. There is suitable nesting habitat present along canals and creeks within the BSA, and suitable foraging habitat in grassland habitats and agricultural areas. There are four CNDDB occurrences within 5 miles of the BSA.

Scientific Name/Common Name	Status[a]			Habitat	Potential for Occurrence within the BSA
	Federal	State	CDFW		
Athene cunicularia/ burrowing owl	BCC	-	SSC	Open, dry annual or perennial grasslands with low-growing vegetation and on the margins of disturbed/developed habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Potential to occur. Suitable habitat is present in the BSA, including burrows along the margins of vineyards, orchards, and other agricultural developments. There are no CNDDB occurrences within 5 miles of the BSA.
Buteo swainsoni/ Swainson's hawk	BCC	T	-	Suitable foraging habitat includes a variety of agriculture crops, grassland, and pasture. Alfalfa fields are more routinely used by foraging Swainson's hawks than any other crop type. Suitable nesting habitat includes trees within mature riparian forest or corridors, lone oak trees and oak groves, and mature roadside trees (man-made structures).	Likely to occur. There is suitable nesting and foraging habitat within the BSA in tall emergent trees and throughout the agriculture areas. There are 38 CNDDB occurrences within 5 miles of the BSA.
Elanus leucurus/ white-tailed kite	-	-	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows for foraging close to isolated, dense-topped trees for nesting and perching.	Potential to occur. There is suitable foraging and nesting habitat present within the BSA and species is likely to fly over. There are no CNDDB occurrences within 5 miles of the BSA; however, this species is often not reported to CNDDB.
Riparia riparia/ bank swallow	BCC	T	-	Forage in flight over (or near) water at all seasons. Nest in colonies in vertical banks of dirt or sand, usually along rivers or ponds, seldom away from water.	Potential to occur. Suitable foraging habitat is present within the BSA along natural and constructed and watercourses. There is one CNDDB occurrence within 5 miles of the BSA.
Setophaga petechia/ yellow warbler	-	-	SSC	Breed in shrubby thickets and woods, particularly along watercourses and in wetlands. Common trees include willows, alders, and cottonwoods across North America.	Potential to occur. Suitable foraging and nesting habitat is present within the BSA. There is one CNDDB occurrence within 5 miles of the BSA.

[a] Status designations are as follows:

Federal Designations:
BCC = Bird of Conservation Concern, T = Threatened

State Designations:
T = Threatened, CE = Candidate Endangered

California Department of Fish and Wildlife (CDFW) Designations:
SSC = Species of Special Concern, FP = Fully Protected

Sources:
CDFW 2023; NMFS 2023; USFWS 2023a

3.3.2.1 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) is listed as threatened under the FESA. This subspecies of longhorn beetle is strongly associated with its host plant, the elderberry (*Sambucus* spp.), and is nearly always found on or in close proximity to the plant. Elderberry species can be found along creek banks, places of organic waste disposal, farms, homesteads, and aquatic-riparian resource areas. Exit holes on elderberry branches from larval galleries can be evident on host plants during post-mating periods.

There are five CNDDB occurrences for VELB within 5 miles of the BSA (Figure 5) and two large elderberry shrubs were observed during the 2021 botanical surveys (Figure 3, page 3). One shrub is located just within the project footprint, next to the proposed guard structure and pull site between PG&E proposed structures W1 and W2. The other shrub is located within the fence line of PG&E Lockeford Substation, surrounded by a small patch of grassland on the eastern side of the substation's general construction yard and outside of the project footprint. Stems ranges from approximately 0.5 inch to up to 4 inches in diameter. No exit holes were noted on the observed shrubs. The VELB and its various life stages have the potential to be in the BSA wherever elderberry is found.

3.3.2.2 Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is listed as threatened under the CESA and is considered a USFWS Bird of Conservation Concern (BCC) (USFWS 2023a). This species forms large breeding colonies by the last week of March through August. Nesting locations typically are freshwater marshes with cattail, rushes, and willows. Increased human activity and competition for nesting locations by the black-crowned night-heron have precluded the species from using much of their former nesting habitat (Holcomb 1979). As a result, blackbirds have been forced to nest in vineyards, orchards, manmade structures, and triticale fields.

There is suitable nesting habitat in emergent vegetation along Paddy Creek and Bear Creek where these features bisect the BSA. There is suitable foraging habitat throughout undeveloped grassland or pasture areas within the BSA. There are four CNDDB occurrences for the tricolored blackbird within 5 miles of the BSA (Figure 5). Of these records, one was a freshwater pond flanking a developed vineyard, one was a canal that is located west of the City of Lodi, one was at Paddy Creek, and one was on the bank of the Calaveras River (CDFW 2023).

3.3.2.3 Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a state species of special concern and a USFWS BCC that is primarily a grassland species, but it is known to persist and occasionally thrive in some landscapes that are altered by human activity (Rosenberg and Haley 2004). Suitable habitat characteristics include burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation (Haug et al. 1993). Nest and roost burrows are most commonly dug by ground squirrels (*Spermophilus beecheyi*; Trulio 1997), but they may use other mammal burrows or manmade structures such as culverts, piles of concrete rubble, and pipes (Ronan 2002). Most California populations are nonmigratory and these habitat types serve for breeding, foraging, and overwintering.

Burrows along the margins of vineyards, orchards, and other agricultural developments can potentially provide habitat for the burrowing owl. Although there are no CNDDB occurrences for this species within 5 miles of the BSA, there is low potential for the species to occur in the vicinity of the project area year-round as there are burrows within grassland or pasture areas, along the margins of vineyards, orchards, and other agricultural developments that could potentially provide nesting habitat. Suitable foraging habitat also is present in grassland or pasture areas. No burrowing owl sign (white-wash, pellets) was observed within the BSA during biological surveys. Potential nesting and foraging habitat, where it occurs, is fragmented, highly disturbed, and actively cultivated for agricultural use, indicating marginal or low-quality habitat.

3.3.2.4 Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as threatened under the CESA and is a USFWS BCC (USFWS 2023a). This species is highly gregarious, forming colonies that number in the thousands (Brown and Amadon 1970). This species winter principally in South America and less commonly in Mexico and the southern tip of the United States (Fuller et al. 1998). The Swainson's hawk arrives in California as early as March, where adults reach breeding areas in the Central Valley of California. This species prefers large prairies, pastures, and narrow bands of riparian vegetation along water courses, and small, isolated stands of valley oak (*Quercus lobata*) for nesting. However, the Swainson's hawk has been found in urban neighborhoods and agricultural developments (England 1995). Rapid urbanization or crop changes near cities could cause the long-term decline of Swainson's hawks in existing urban neighborhoods. Mating pairs often return to their previous nest location or within proximity to it for recurring breeding seasons (Brown and Amadon 1970).

There are 38 CNDDB occurrences for this species within 5 miles of the BSA (Figure 5). Of these records, the nearest occurrence is located within the project area near PG&E tubular steel poles W7 and W8 approximately 0.75 mile southwest of PG&E Lockeford Substation. There is suitable nesting and marginally suitable foraging habitat within and adjacent to the BSA. Suitable nesting habitat occurs in large trees that are common along roadways, in residential and agricultural areas, and along watercourses such as Bear Creek and Paddy Creek. Foraging habitat is marginal within the BSA, primarily in areas of fragmented grassland or pastureland. The dominant agriculture uses within the BSA (vineyard, cherry, and walnut) are not preferred by Swainson's hawk and therefore provide low-quality foraging habitat.

3.3.2.5 White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is a California FP species. This species inhabits rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. This species forages in grasslands, marshes, riparian edges, and cultivated fields where prey species (mainly small mammals) are relatively abundant (Kaufman 1996). Kites typically nest on the tops of trees close to good foraging locations.

There is marginally suitable nesting and foraging habitat for the species in the vicinity of the BSA where it includes or is in proximity to grasslands, pastures, and agricultural areas that may support small mammal prey. There is no suitable nesting habitat for this species within the project footprint, but there is suitable nesting habitat in the form of dense-top trees along roadways, in residential and agricultural areas, and along watercourses such as Bear Creek and Paddy Creek, within and near the BSA. There is potential for the species to forage in undeveloped areas in the vicinity of all work locations. There are no CNDDB occurrences within 5 miles of the BSA; however, this species is often not reported to CNDDB.

3.3.2.6 Bank Swallow

The bank swallow (*Riparia riparia*) is listed as threatened under the CESA, as a USFWS BCC (USFWS 2023a), and as a common bird of steep decline by Partners in Flight (Partners in Flight 2021). This species is sociable with its nesting habits, and nesting colonies often contain from a dozen to many hundreds of breeding pairs (Beyer 1938). It winters in eastern and southern Africa, South America, and the Indian subcontinent and returns to the United States for breeding towards the end of March. It leaves breeding ranges by the end of September. Bank swallows build nests, often in large colonies, in vertical banks and bluffs (Beyer 1938). These colonies usually are made in loose soils into which the birds can burrow easily. Each individual bank swallow chooses first a colony, according to its location, and then a nest site within the colony area. The male begins to dig a burrow into the bank before he has a mate; the female then hovers in front of burrows to choose a mate and his nest site (Petersen 1955). The nests usually are located mostly in the upper third of the bank to avoid ground predators. Increasing urbanization and loss of nesting habitat has caused a rapid decline of bank swallows in their existing Californian ranges.

There is one CNDDB occurrence within 5 miles of the BSA (Figure 5). This occurrence is located approximately 5 miles north from new PG&E tubular steel pole E1 along the bank of the Mokelumne River (CDFW 2023). There is potential nesting habitat along the creek banks of Bear and Paddy creeks that overlap the BSA. The proposed PG&E structure W11 has the closest work area to the western bank of Bear Creek, located approximately 75 feet west. Additionally, bank swallows were observed in mixed swallow flocks during the reconnaissance-level survey conducted in December of 2019 (Table 1).

3.3.2.7 Yellow Warbler

The yellow warbler (*Setophaga petechia*) is a CDFW SSC. Nest preference of this species is shrubby thickets and woods along watercourses (CDFW 2023). Common trees used for nesting locations are willows, alders (*Alnus* ssp.), and cottonwoods (*Populus* spp.) (CDFW 2023).

There is one CNDDB occurrence within 5 miles of the BSA (Figure 5). It is approximately 4.7 miles north from new PG&E tubular steel pole E13 in a thicket along the bank of the Mokelumne River (CDFW 2023). Sparse willows along the banks of Bear Creek, Paddy Creek, and associated drainages within the BSA along the proposed PG&E 230 kV transmission line may provide marginally suitable nesting habitat; however, these areas do not constitute “dense thickets” and are considered low quality. Potential foraging habitat includes deciduous trees and shrubs that support insect prey and could occur throughout the BSA.

While the majority of the BSA is developed and disturbed, there is still potentially suitable nesting habitat for migratory birds. Nesting bird surveys will be conducted prior to work activities if they take place during the nesting bird season.

3.3.3 Potential Wildlife Corridors and Nursery Sites

Natural watercourses within the BSA include Bear Creek and Paddy Creek. Bear Creek is a perennial creek and Paddy Creek is an intermittent creek. At the time of the delineation, Paddy Creek was dry and Bear Creek had only isolated areas of standing water (Jacobs 2022). During times of high flow and hydrological connectivity within each of these creeks, Paddy Creek and Bear Creek could potentially provide migratory pathways for aquatic species. However, there will be no impacts to Bear Creek or Paddy Creek and, therefore, no impacts to migratory pathways for aquatic species.

Migratory birds may move through the BSA during work activities and may nest in the vicinity. Construction activities may temporarily degrade nesting habitat within the immediate vicinity of the work locations; however, any potential effect is expected to be minimal because of the already-disturbed nature of the work locations and large amount of surrounding habitat.

4. Discussion and Summary of Recommendations

4.1 Special-Status Species

The majority of the BSA is cultivated and disturbed. While succulent owl’s clover and Sanford’s arrowhead were determined to have the potential to occur within the BSA, they were not observed within areas of suitable habitat during appropriately timed botanical surveys, and the mesic habitats that they are associated with will not be impacted during project construction. As such, they are not expected to be present or adversely affected during project activities.

The VELB and its various life stages have the potential to occur in the BSA wherever elderberry is found. Project activities, including removal of elderberry plants, could result in direct injury and mortality of VELBs. Prior to construction, a focused survey to determine the presence of elderberry will be conducted and, if found, it will be avoided during construction.

Tricolored blackbird, burrowing owl, Swainson's hawk, white-tailed kite, bank swallow, and yellow warbler have potential to occur within the BSA. Suitable foraging habitat for these species is present in the vicinity of all the work locations and there is suitable nesting habitat for the tricolored blackbird, Swainson's hawk, bank swallow, and yellow warbler in the vicinity of the project footprint. Project activities have the potential to impact nesting individuals of these and other species protected under the Migratory Bird Treaty Act. Potential temporary impacts could include nest abandonment and degradation of foraging habitat. Given the limited size of the work areas relative to the surrounding expanse of adjacent suitable foraging habitat areas, and the existing disturbed nature of the work areas, the temporary loss of foraging habitat is not expected to adversely affect these or other bird species. Preconstruction nesting bird surveys will be completed prior to project activities, and no impacts to these species are expected. Appropriate activity-free buffers that should be implemented around migratory bird nests are identified in PG&E's Avian Program (PG&E 2015).

4.2 Water Resources and Wetlands

Within the BSA, there are eight seasonal wetlands, natural watercourses (one perennial and one intermittent stream), constructed watercourses, and drainage ditches; however, none of these potentially jurisdictional wetlands and waters are within the project footprint and none will be impacted. An irrigation ditch within the BSA that runs parallel to the access route and partially intersects the project footprint at PG&E structure W9 will be avoided during construction. Placement of this structure will be coordinated with the landowner during final design and construction planning to ensure impacts to this ditch are avoided.

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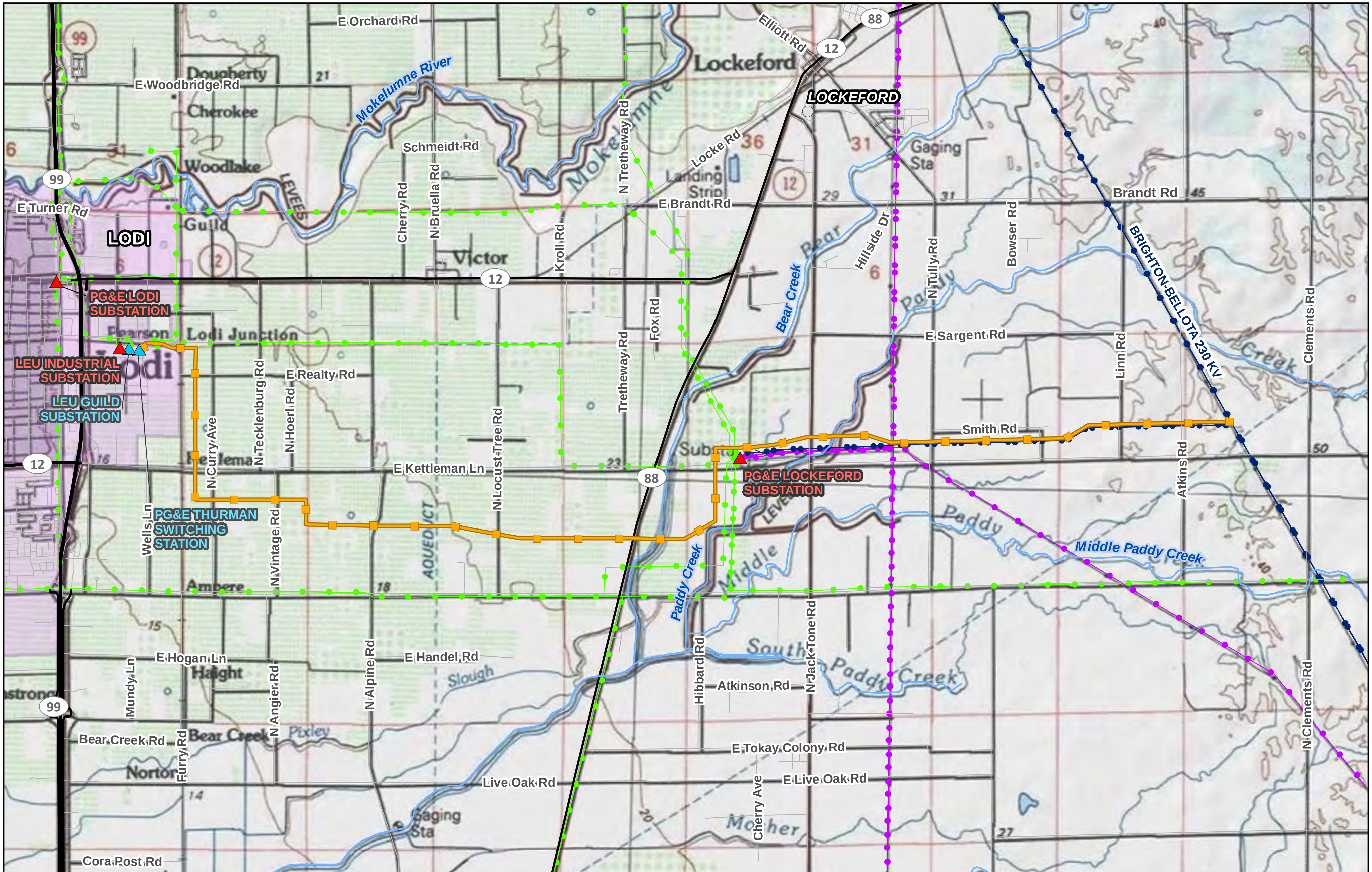
Figures



Legend

- Existing Substation
- New Substation/ Switching Station
- PG&E New 230 kV Transmission Line
- Existing PG&E 60 kV Power Line
- Existing PG&E 115 kV Transmission Line
- Existing PG&E 230 kV Transmission Line
- Major_Roads
- Local Road
- River/Stream
- City Boundary

Source:
1) Base Map Source: Esri USA Topo Maps

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Project Location

Figure 1
Project Location
Northern San Joaquin 230 kV Transmission Project

Jacobs

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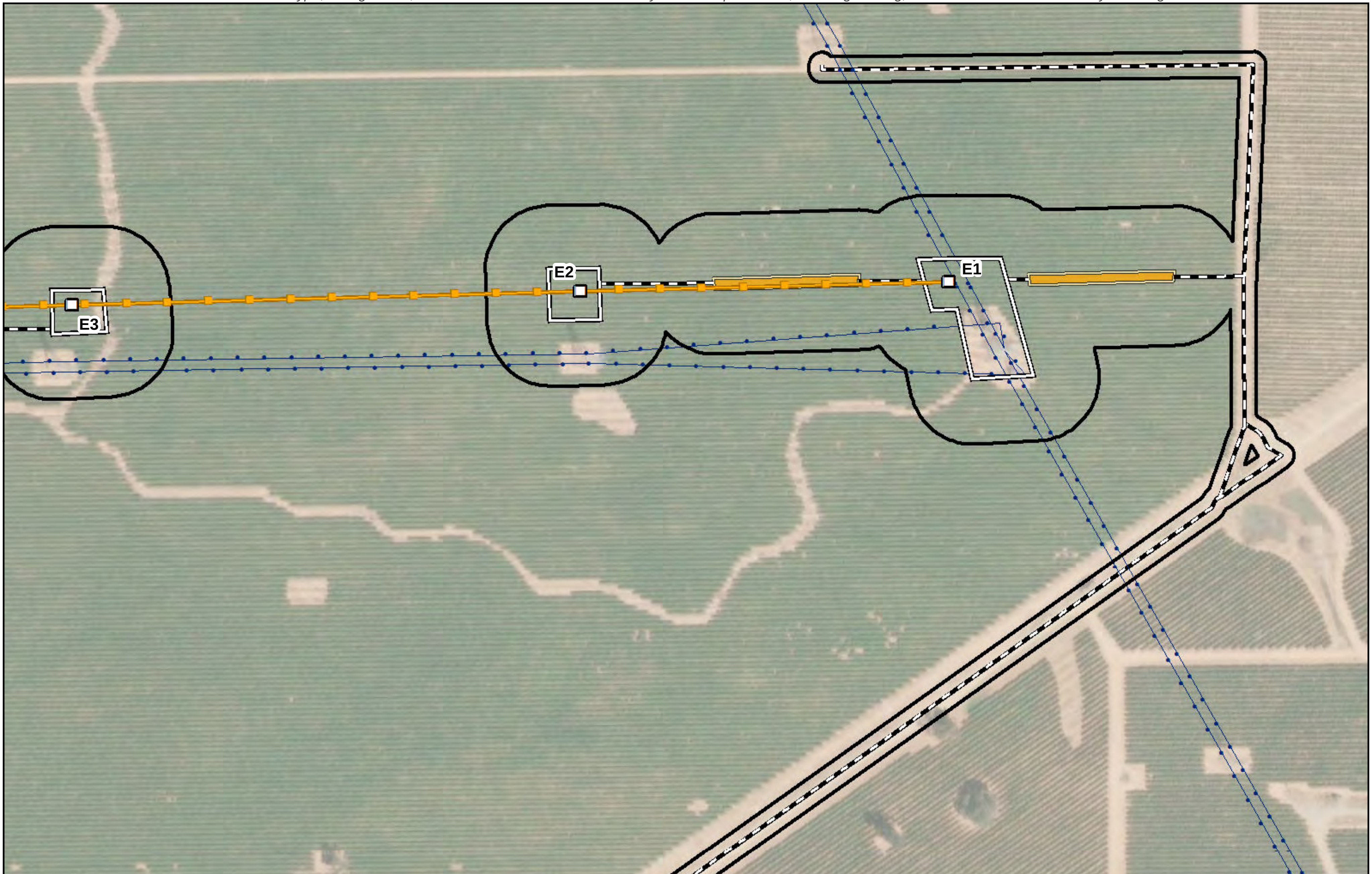
Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

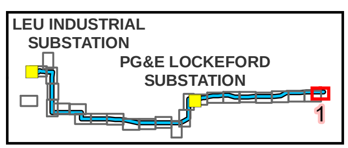


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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 1 of 26
Northern San Joaquin 230 kV Transmission Project

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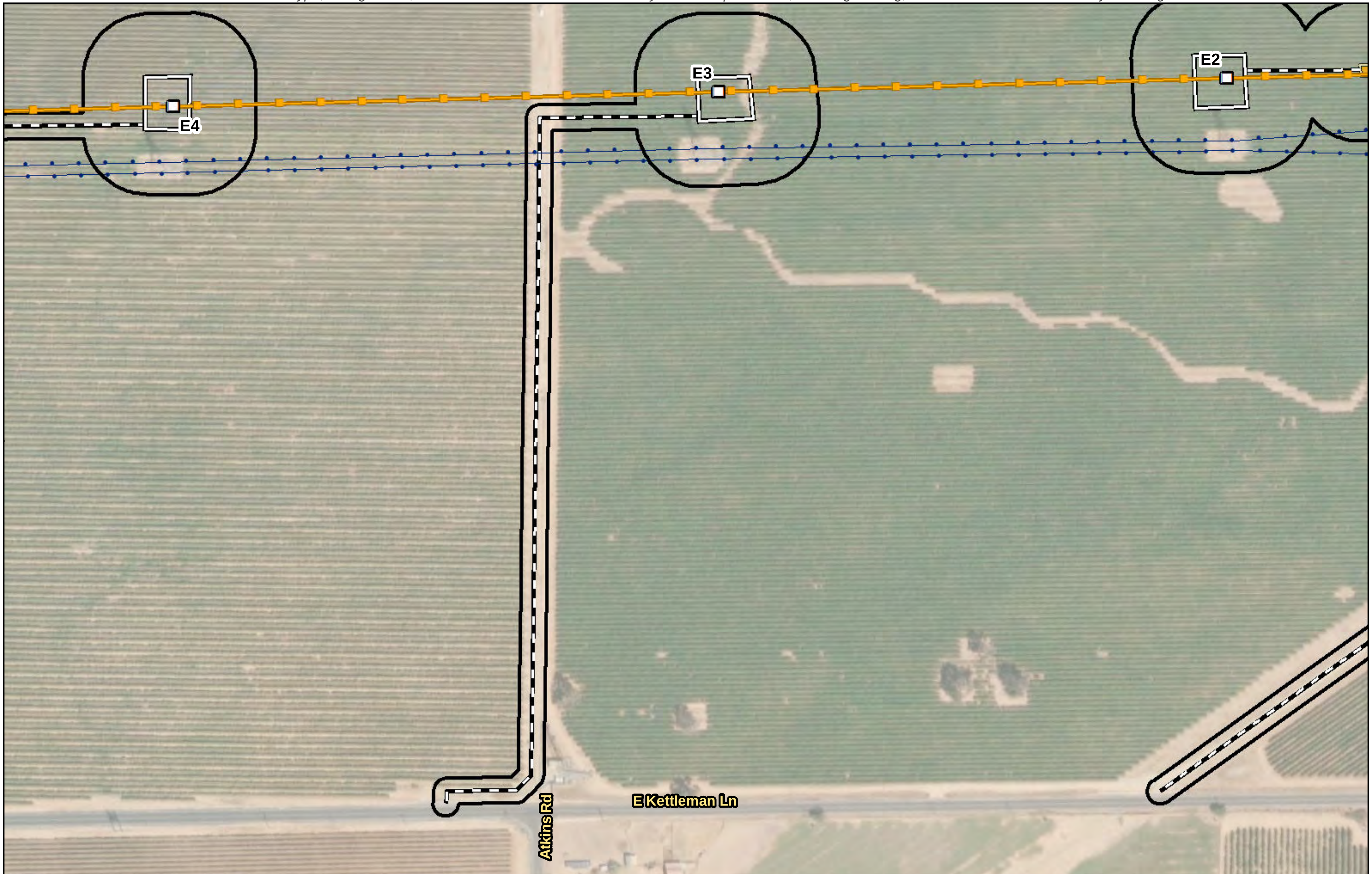
Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Source:
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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 2 of 26
Northern San Joaquin 230 kV Transmission Project

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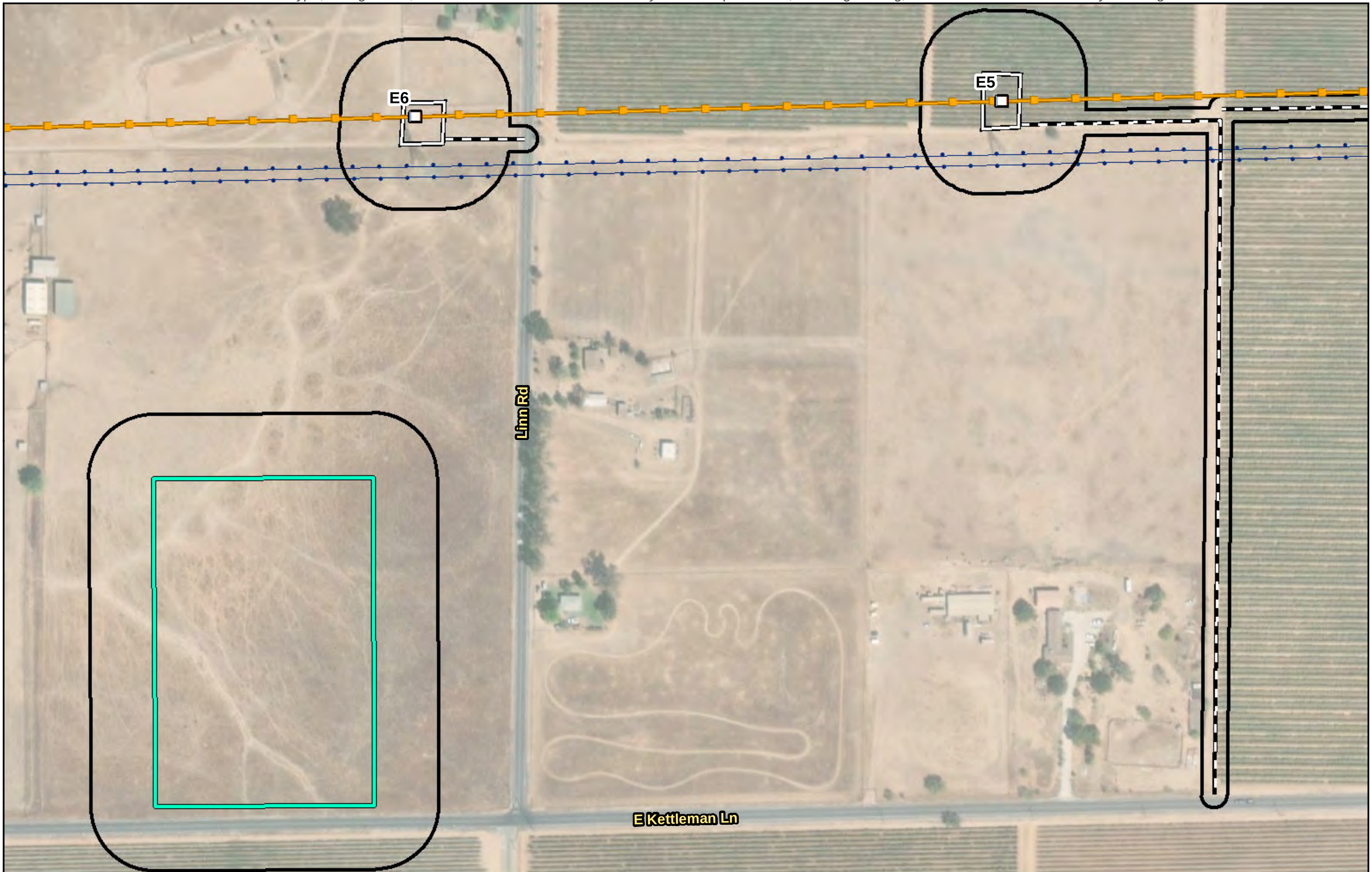

Legend

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- Substation
- PG&E New 230 kV Transmission Line
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- Existing 230 kV Transmission Line

Proposed Impact Areas

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- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
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- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

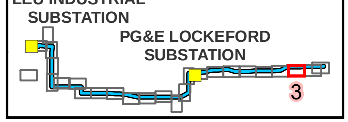

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 3 of 26
Northern San Joaquin 230 kV Transmission Project

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Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

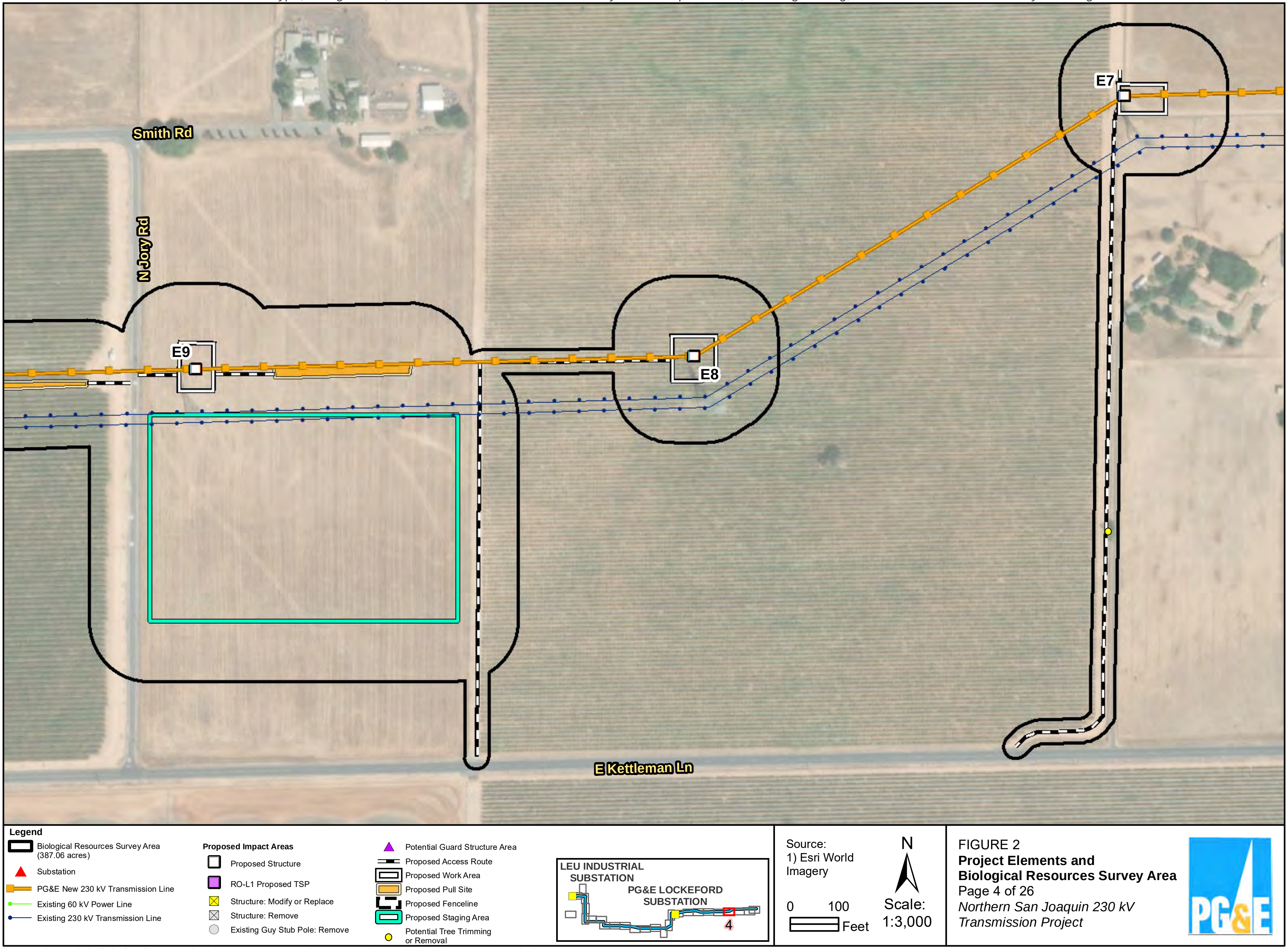

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 4 of 26
Northern San Joaquin 230 kV Transmission Project

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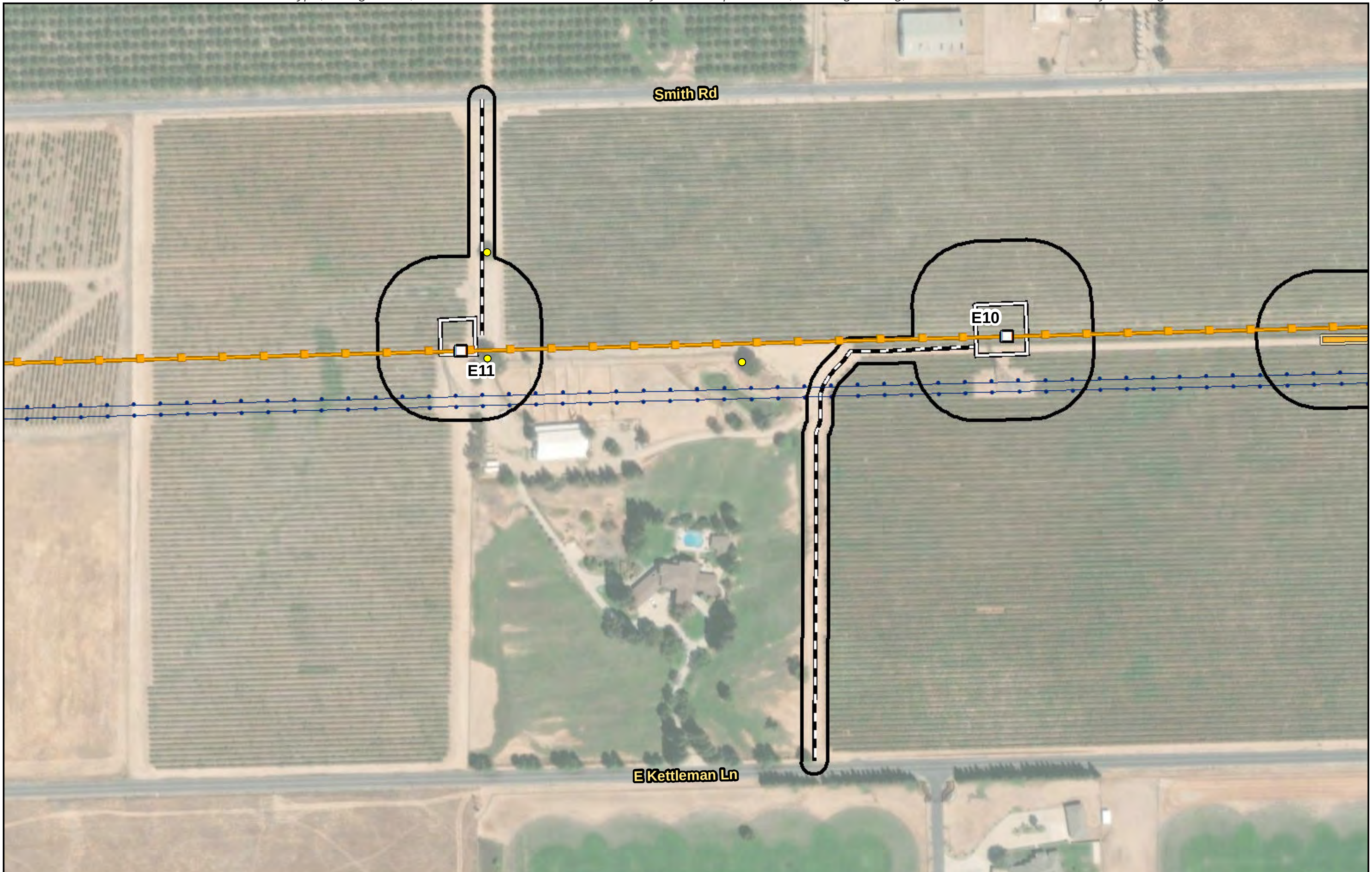

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

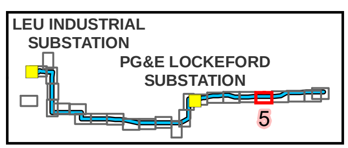

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 5 of 26
Northern San Joaquin 230 kV Transmission Project

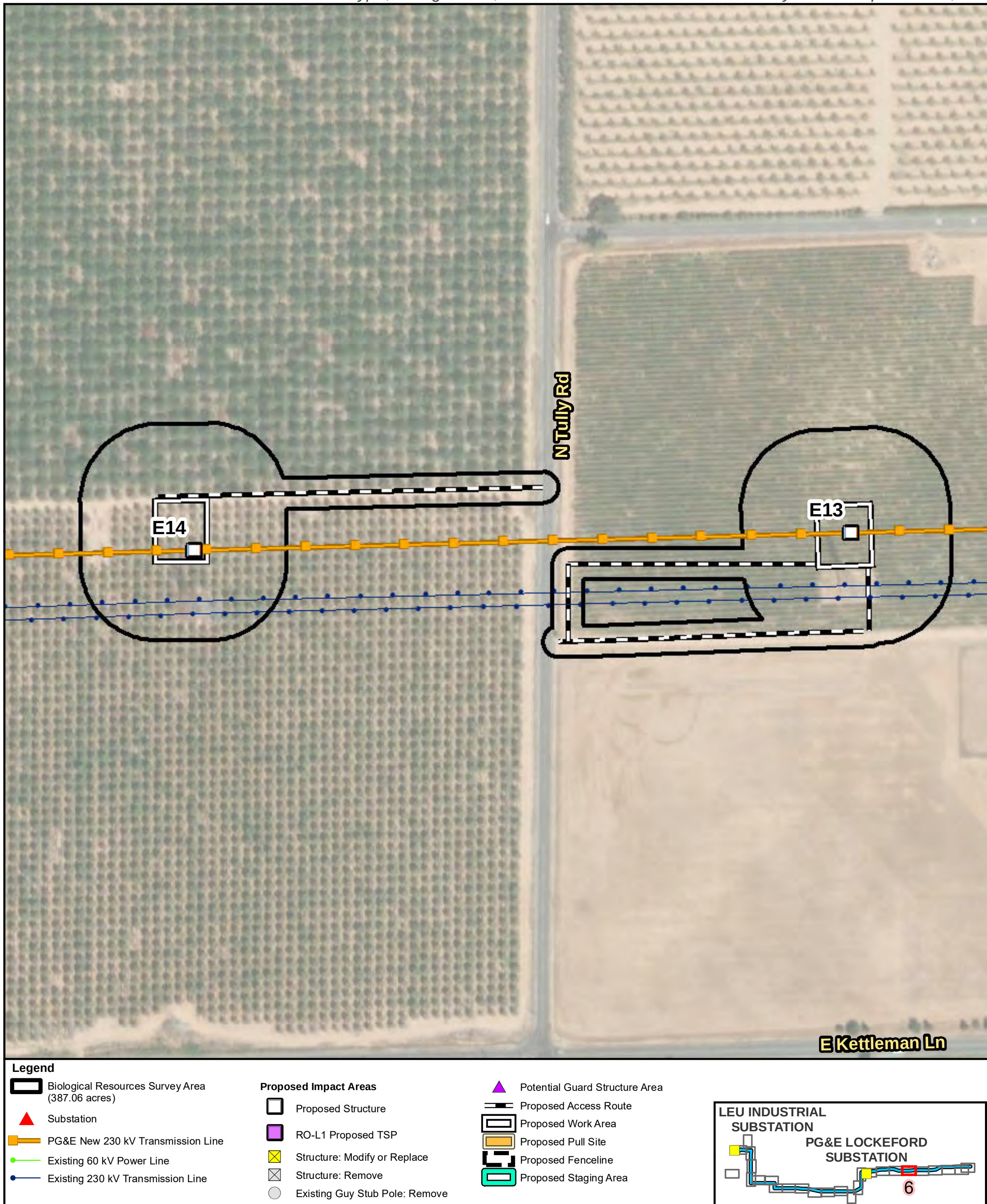

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 6 of 26
Northern San Joaquin 230 kV Transmission Project

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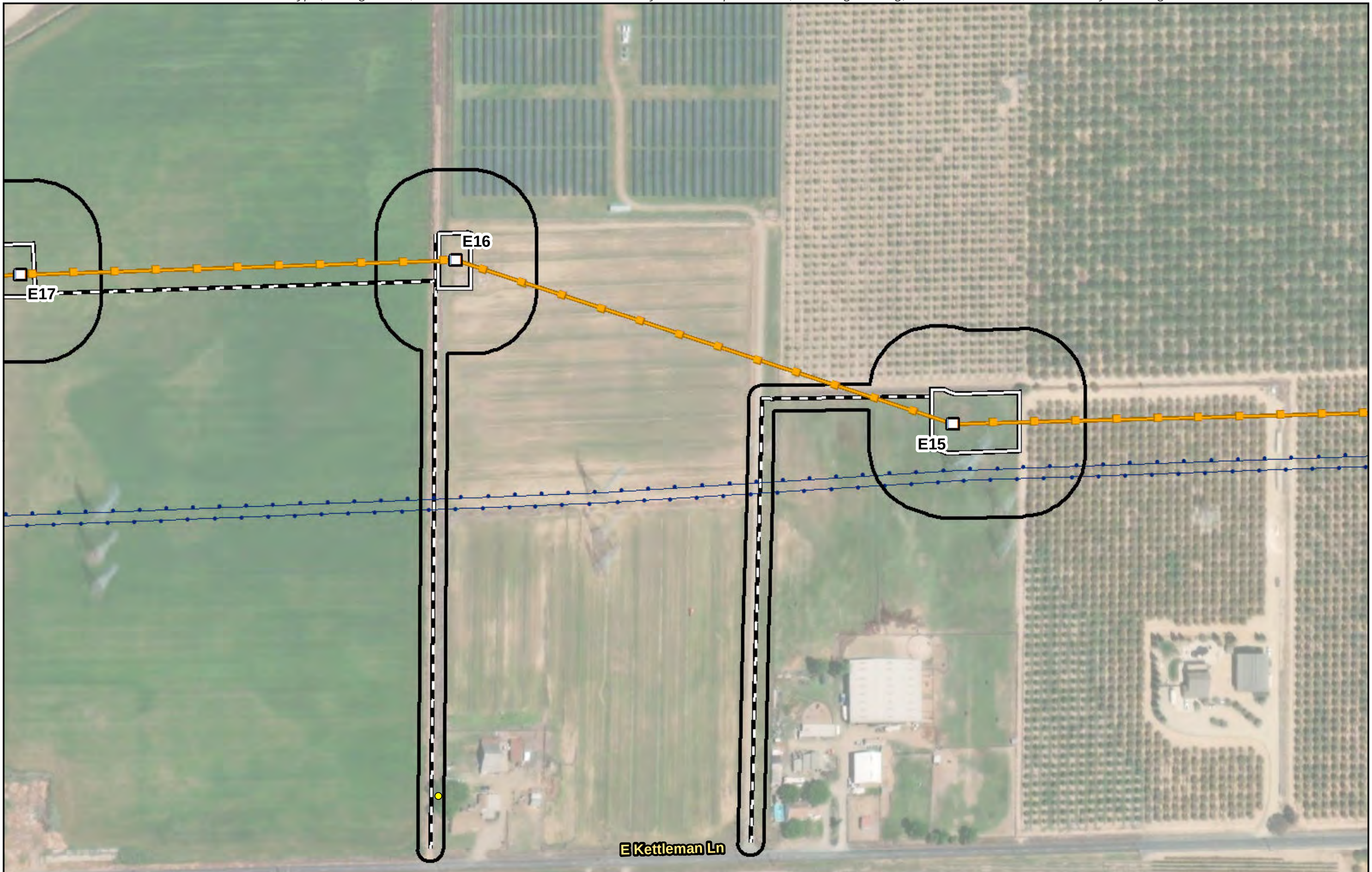

Legend

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- Existing 230 kV Transmission Line

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- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal

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PG&E LOCKEFORD SUBSTATION
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Source:
1) Esri World Imagery

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 7 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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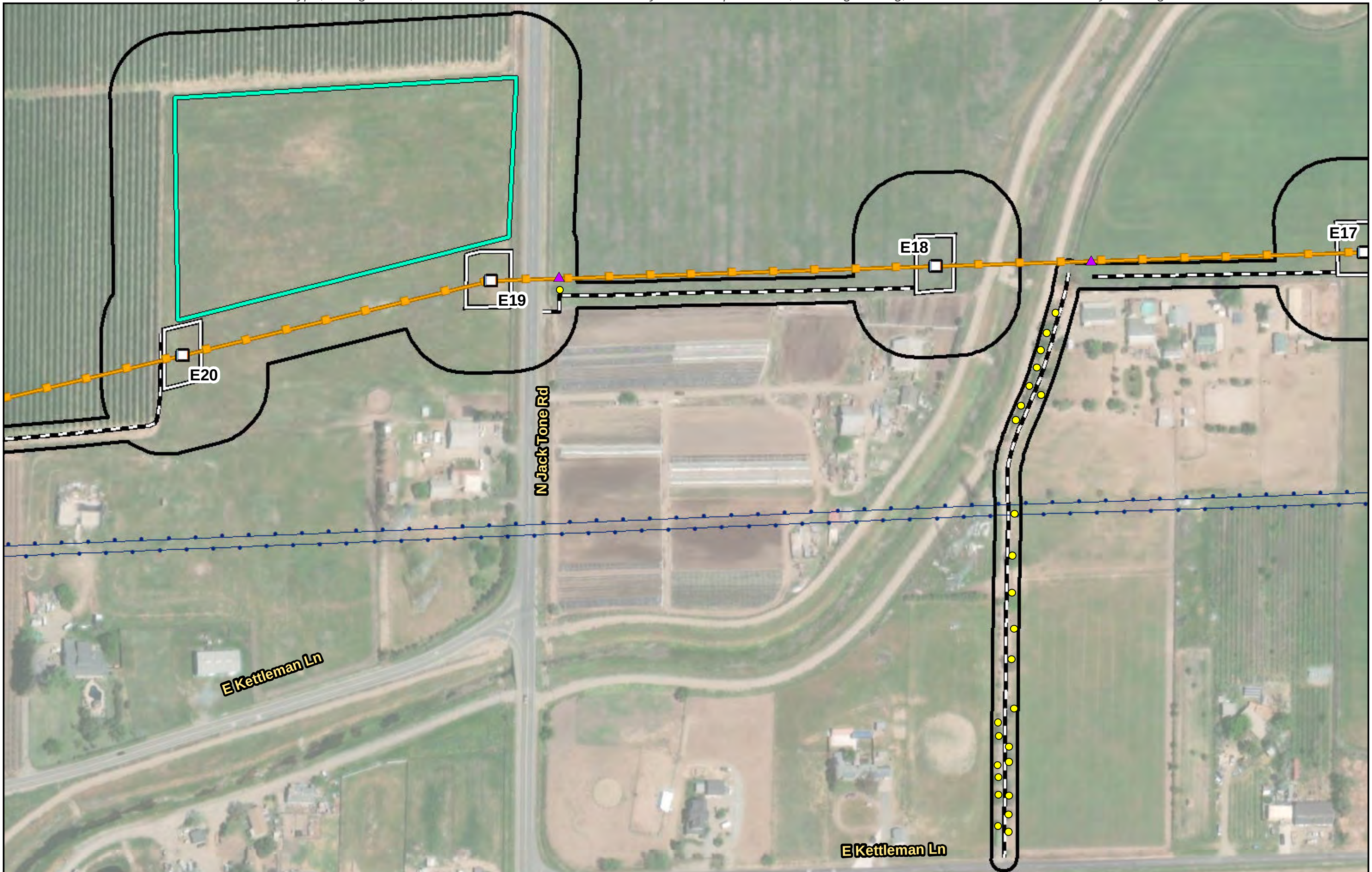

Legend

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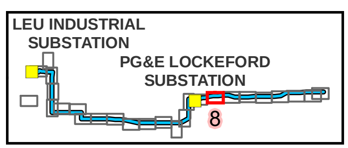

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 8 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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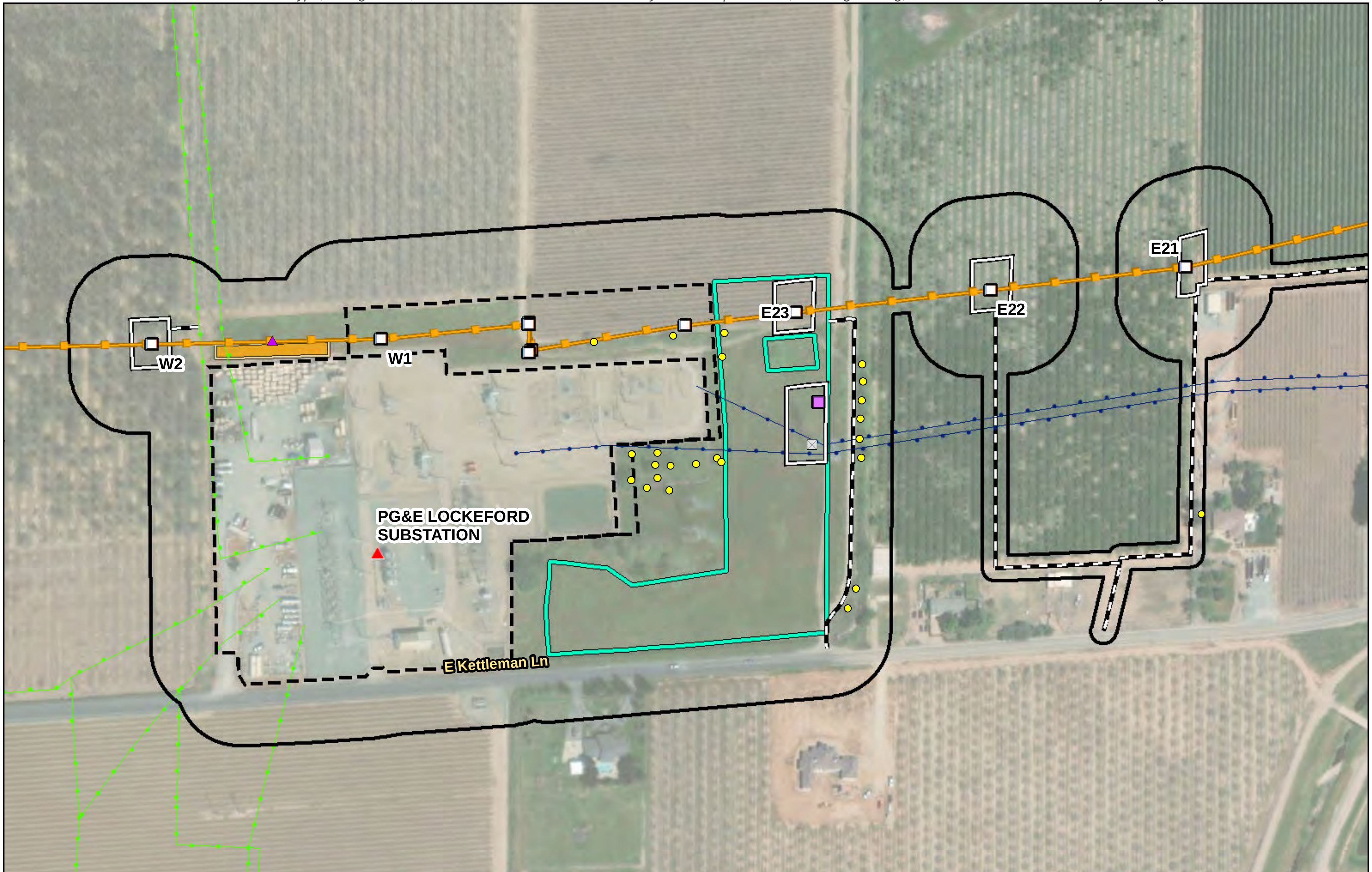
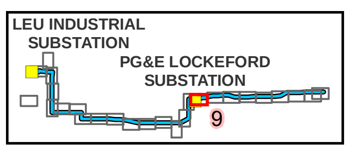


Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 9 of 26
Northern San Joaquin 230 kV Transmission Project

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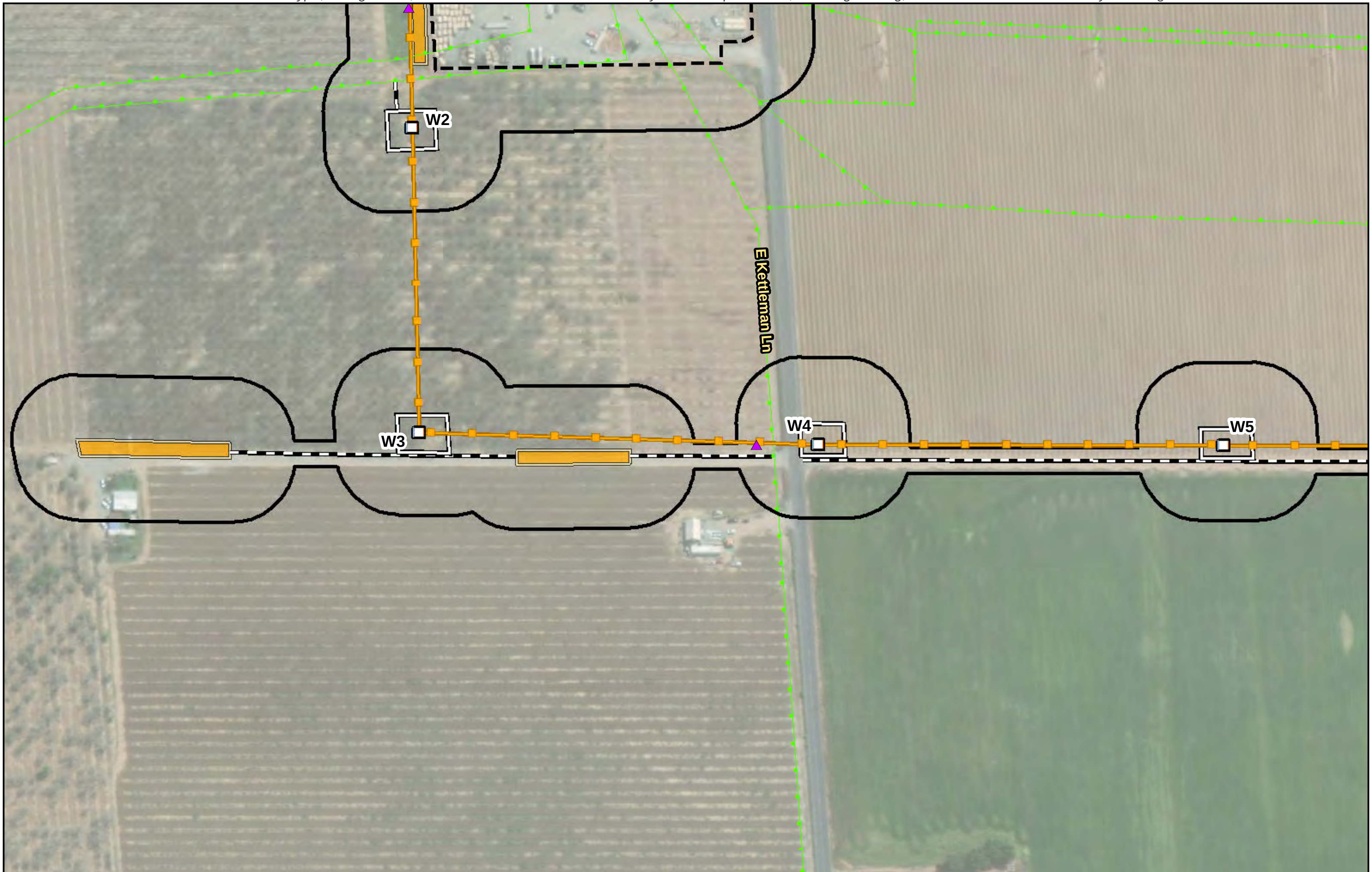

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
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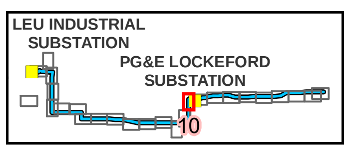

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 10 of 26
Northern San Joaquin 230 kV Transmission Project

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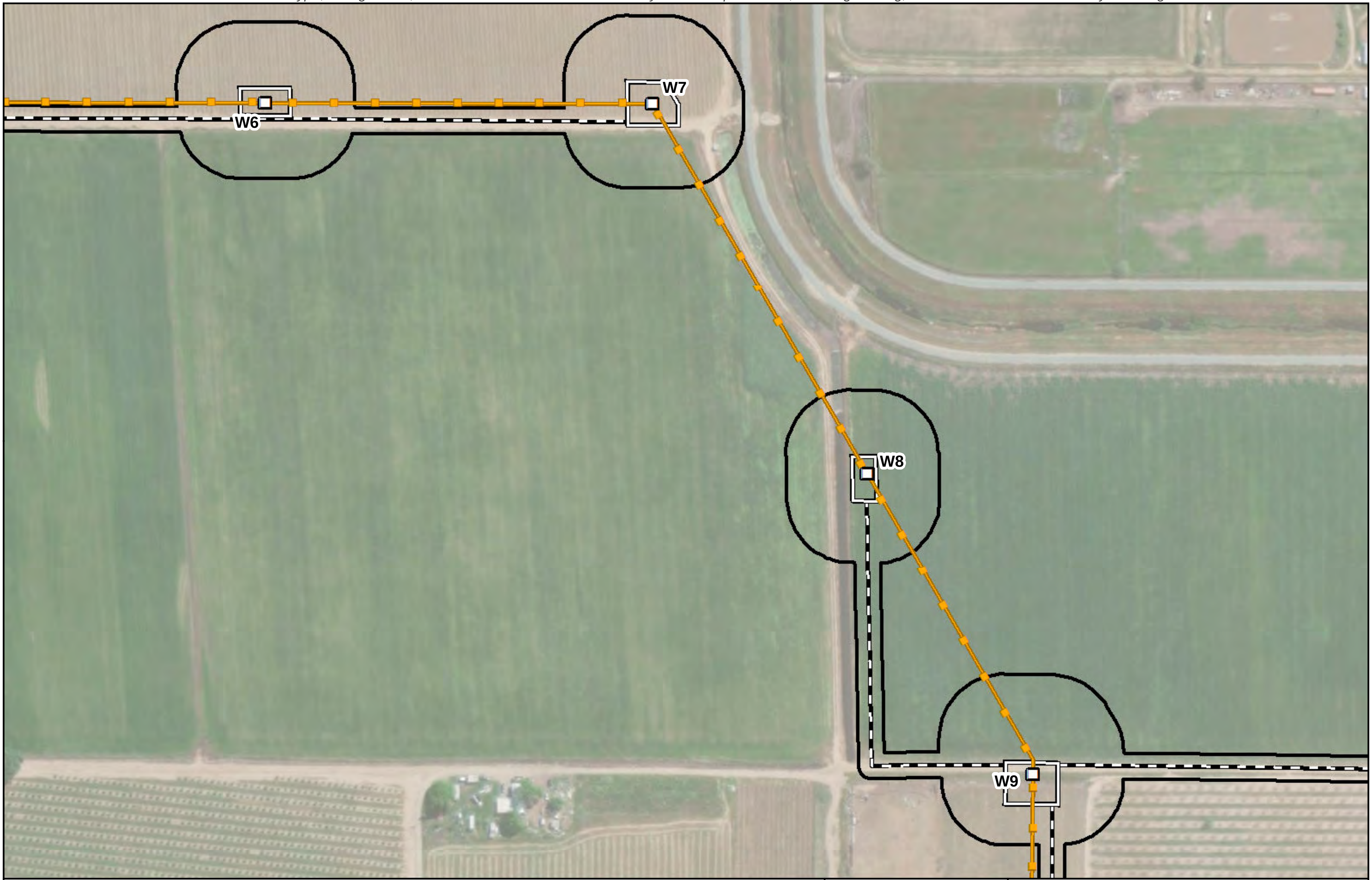

Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
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Proposed Access Route
Proposed Work Area
Proposed Pull Site
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Proposed Staging Area

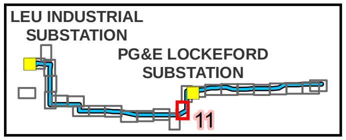

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 11 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

Preliminary design and engineering for the physical, civil, and outdoor components.
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Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

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Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal

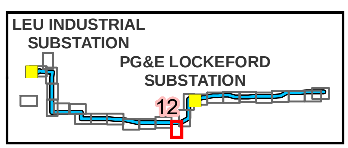

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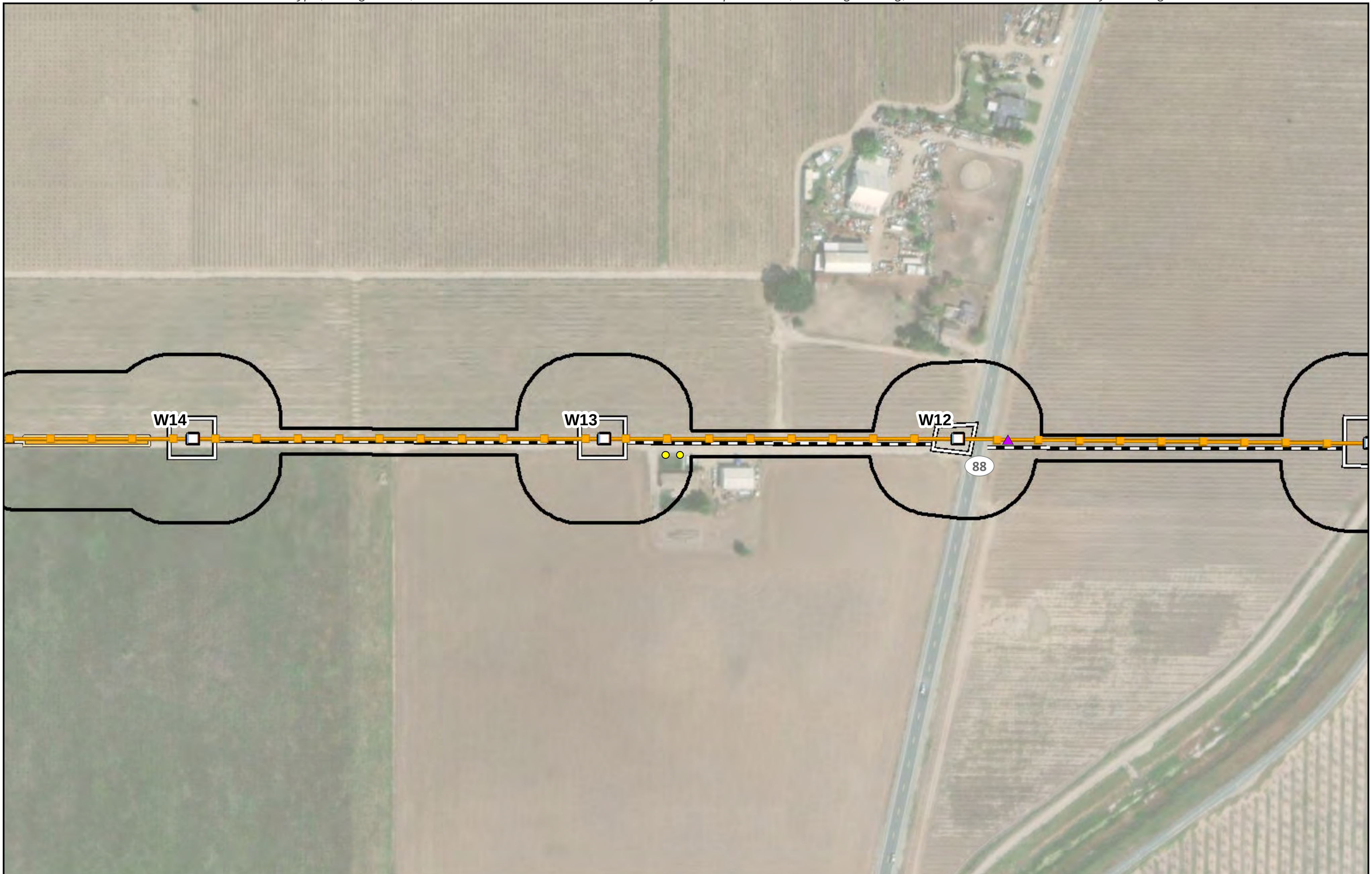
FIGURE 2
Project Elements and Biological Resources Survey Area
Page 12 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

- Biological Resources Survey Area (387.06 acres)
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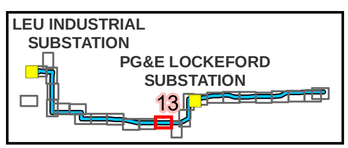

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 13 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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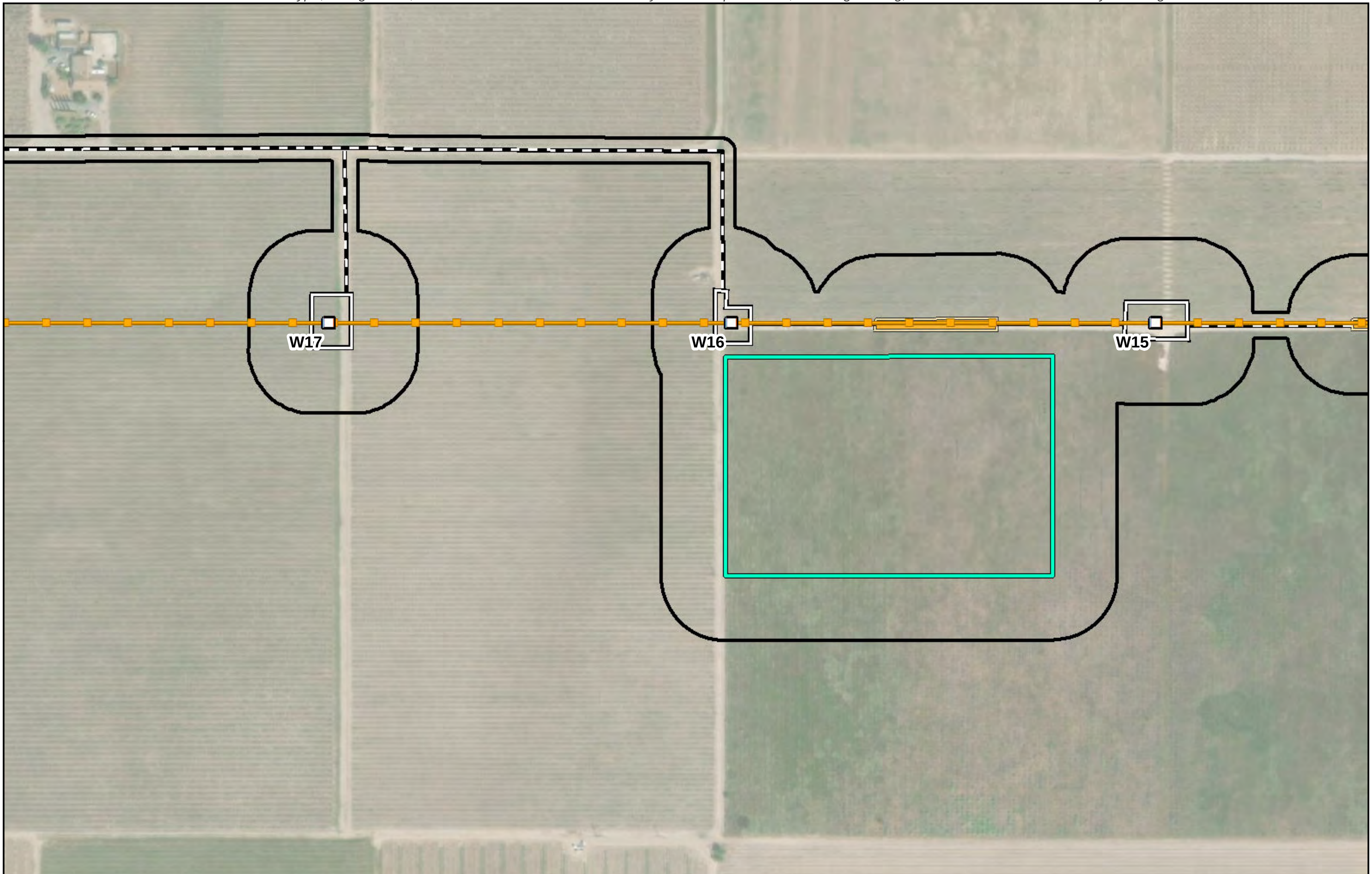

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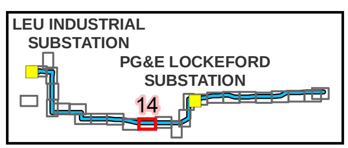

Source:
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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 14 of 26
Northern San Joaquin 230 kV Transmission Project

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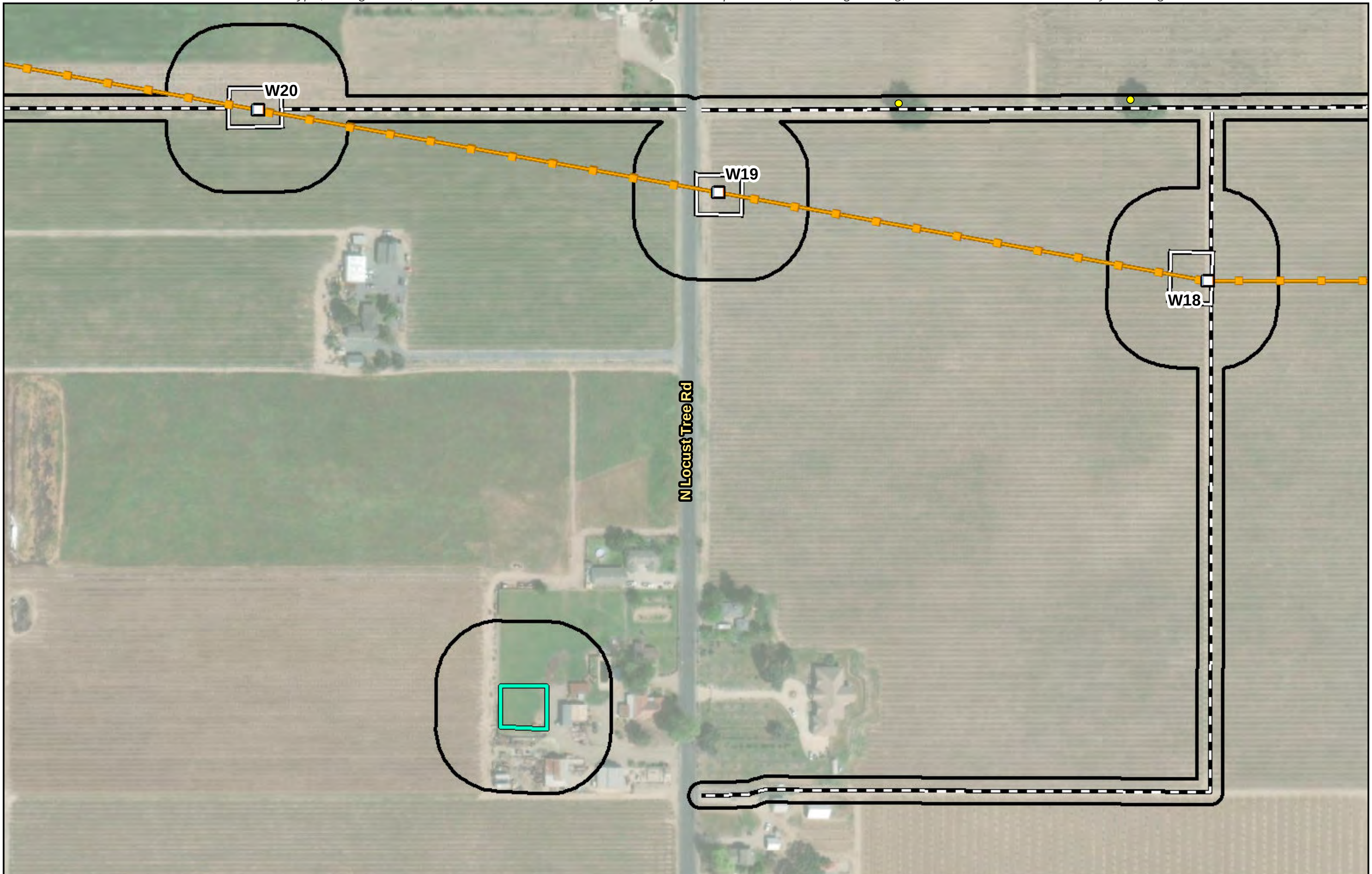

Legend

- Biological Resources Survey Area (387.06 acres)
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- Proposed Staging Area
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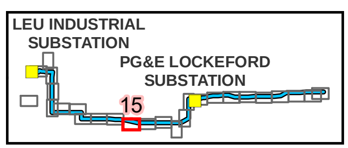

Source:
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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 15 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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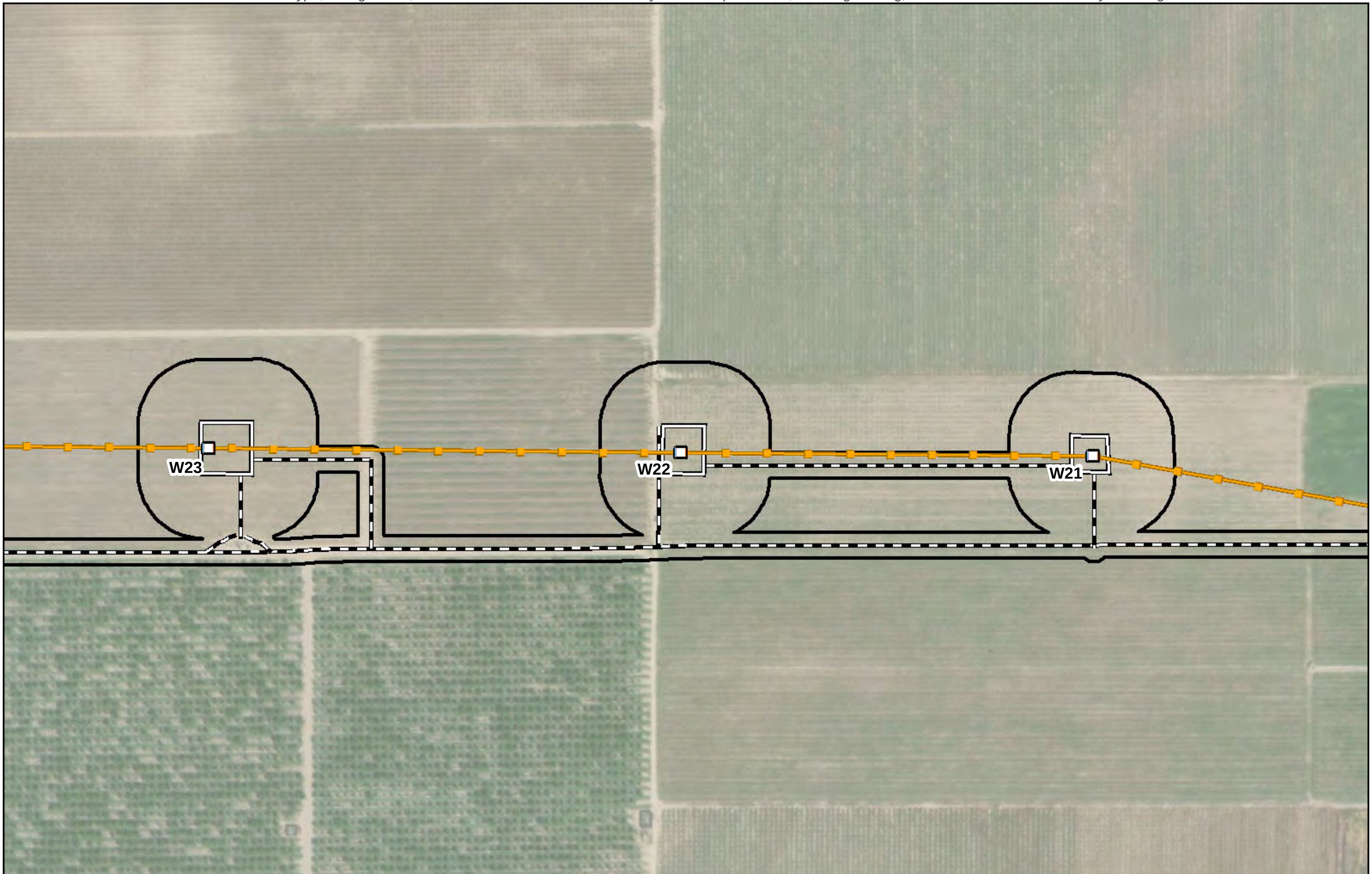

Legend

- Biological Resources Survey Area (387.06 acres)
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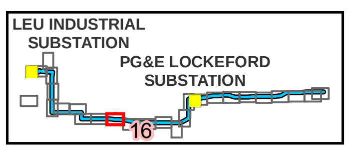

Source:
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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 16 of 26
Northern San Joaquin 230 kV Transmission Project

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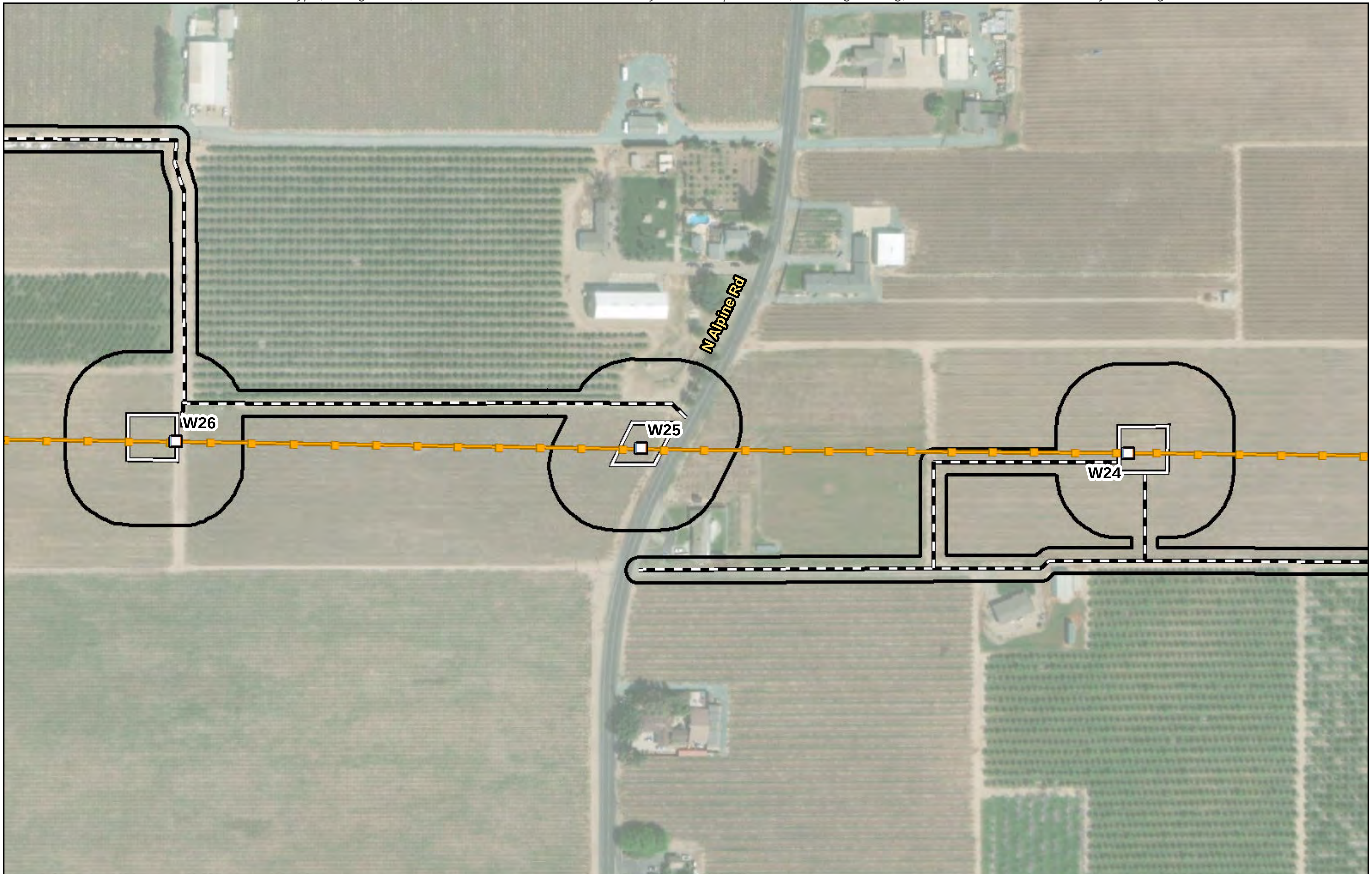

Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
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Proposed Impact Areas

Proposed Structure
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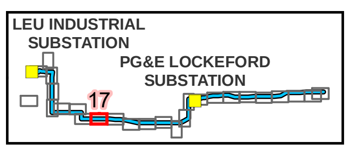

Source:
1) Esri World Imagery

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0 100 Feet
Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 17 of 26
Northern San Joaquin 230 kV Transmission Project

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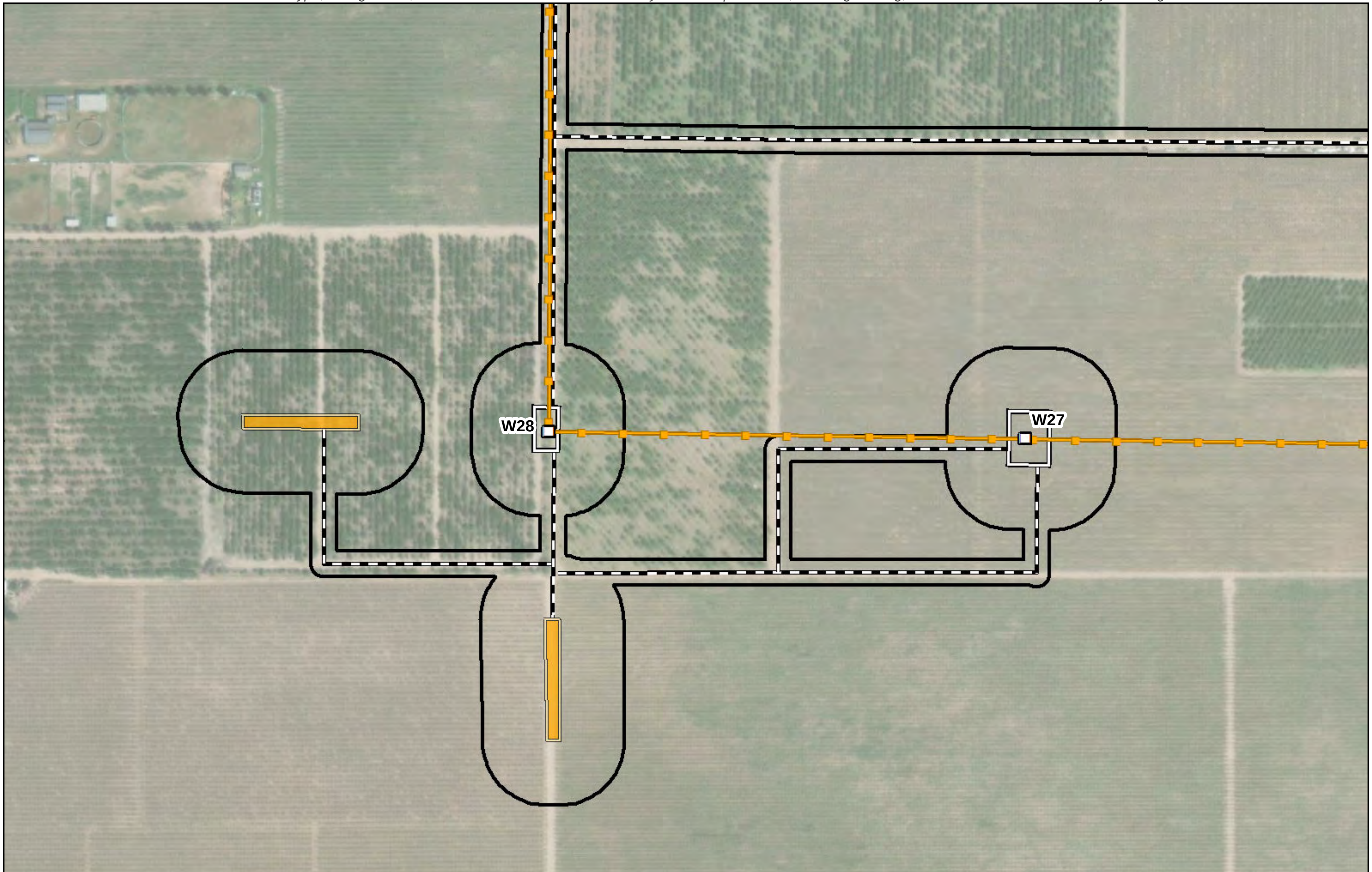

Legend

- Biological Resources Survey Area (387.06 acres)
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Proposed Impact Areas

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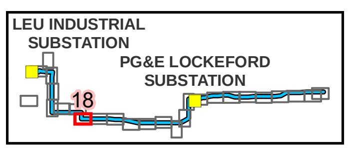

Source:
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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 18 of 26
Northern San Joaquin 230 kV Transmission Project

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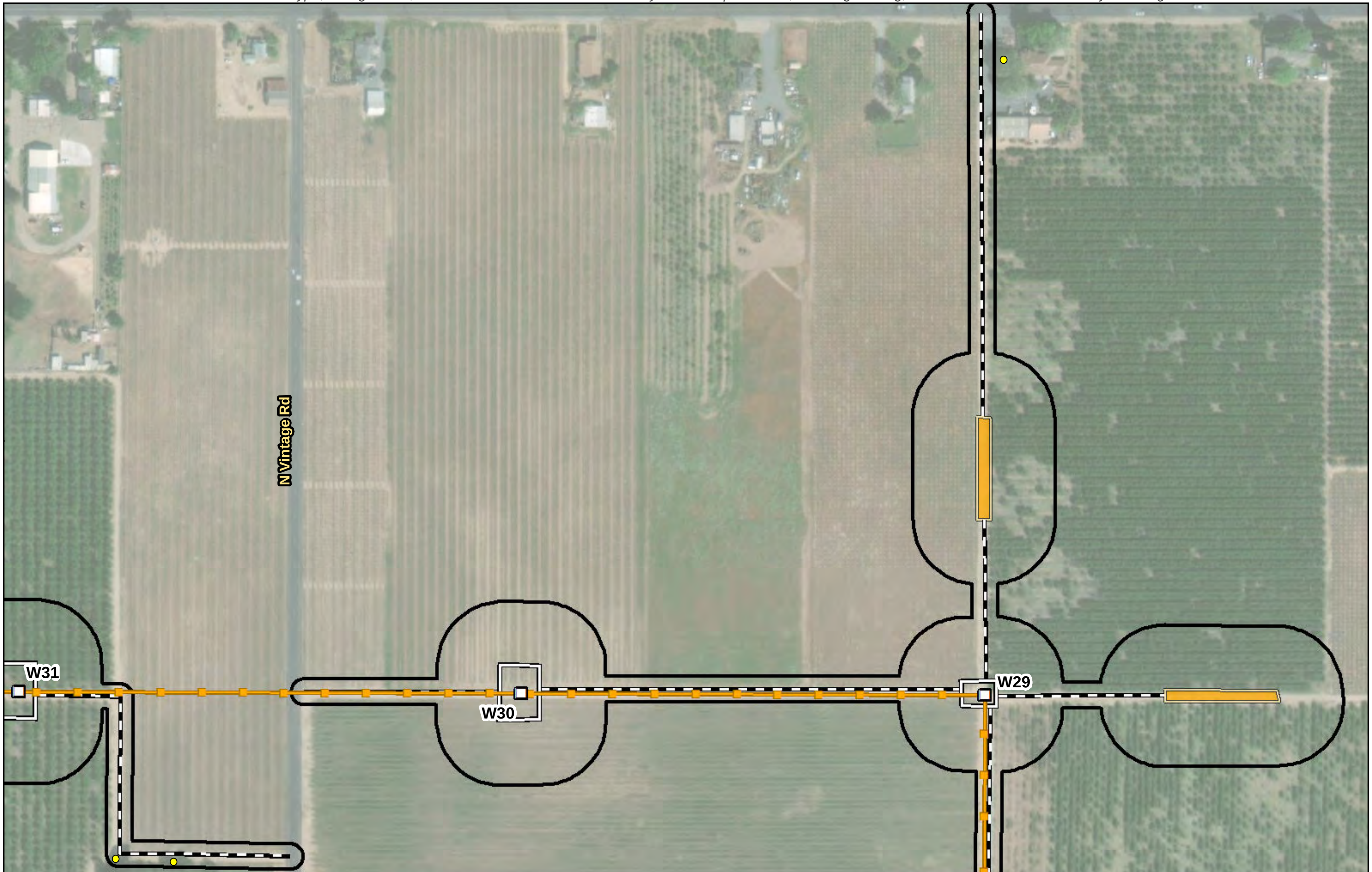

Legend

- Biological Resources Survey Area (387.06 acres)
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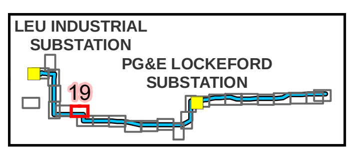

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 19 of 26
Northern San Joaquin 230 kV Transmission Project

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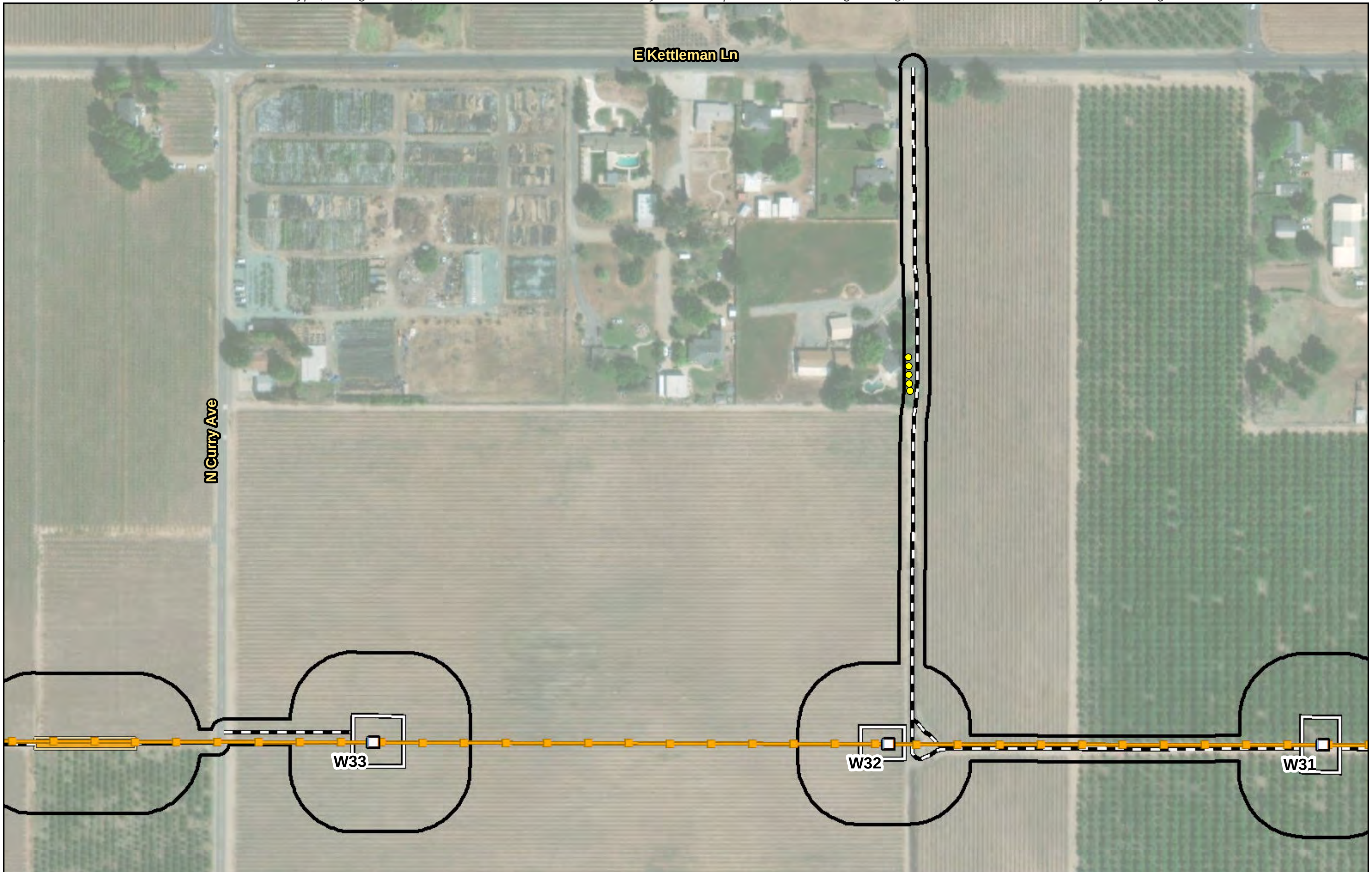

Legend

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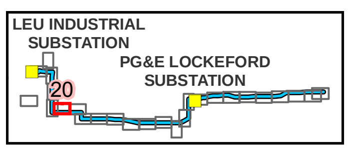

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FIGURE 2
Project Elements and Biological Resources Survey Area
Page 20 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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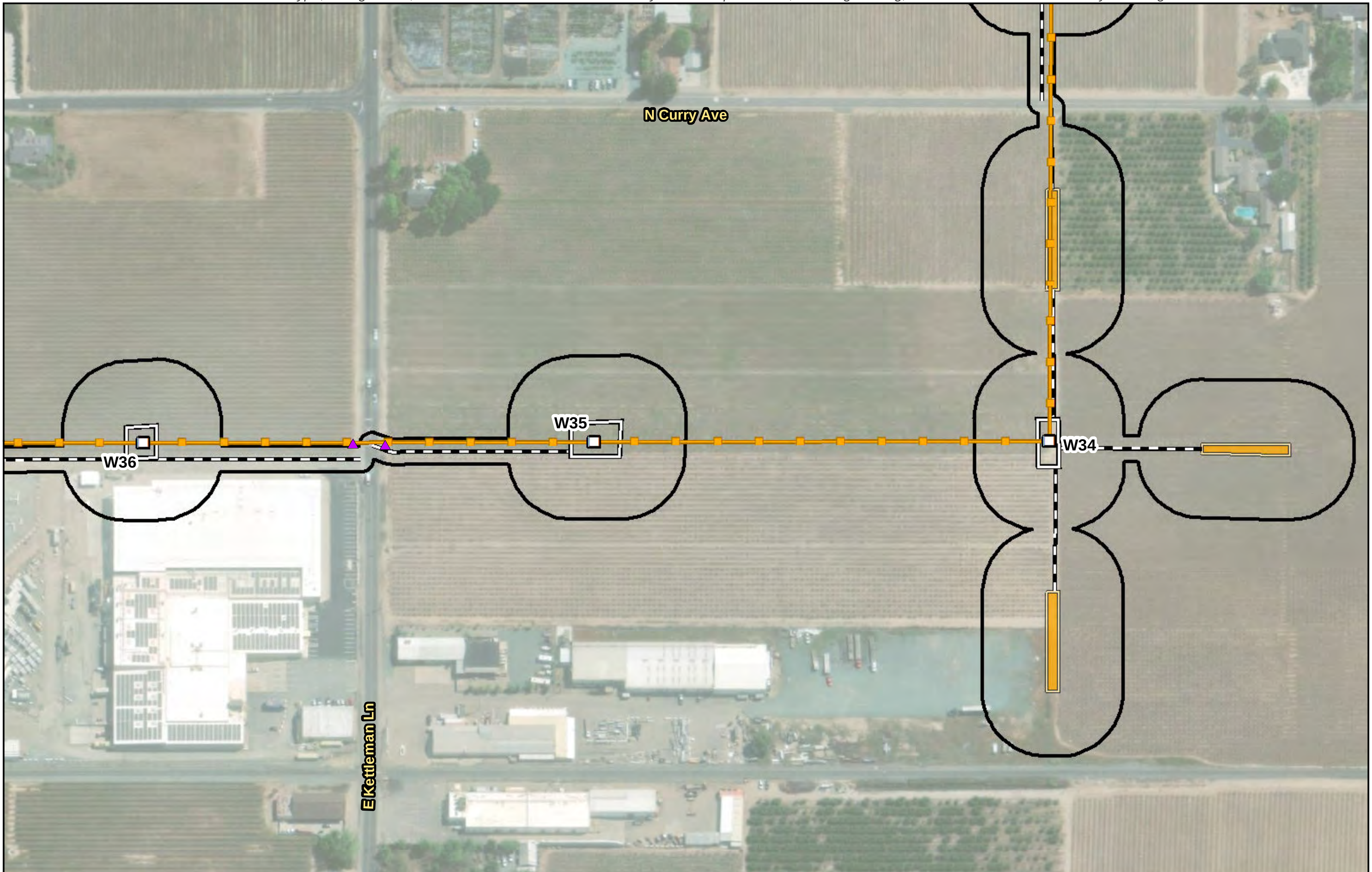

Legend

- Biological Resources Survey Area (387.06 acres)
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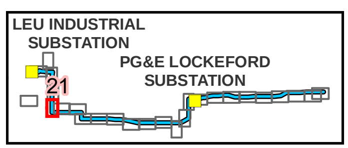

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 21 of 26
Northern San Joaquin 230 kV Transmission Project

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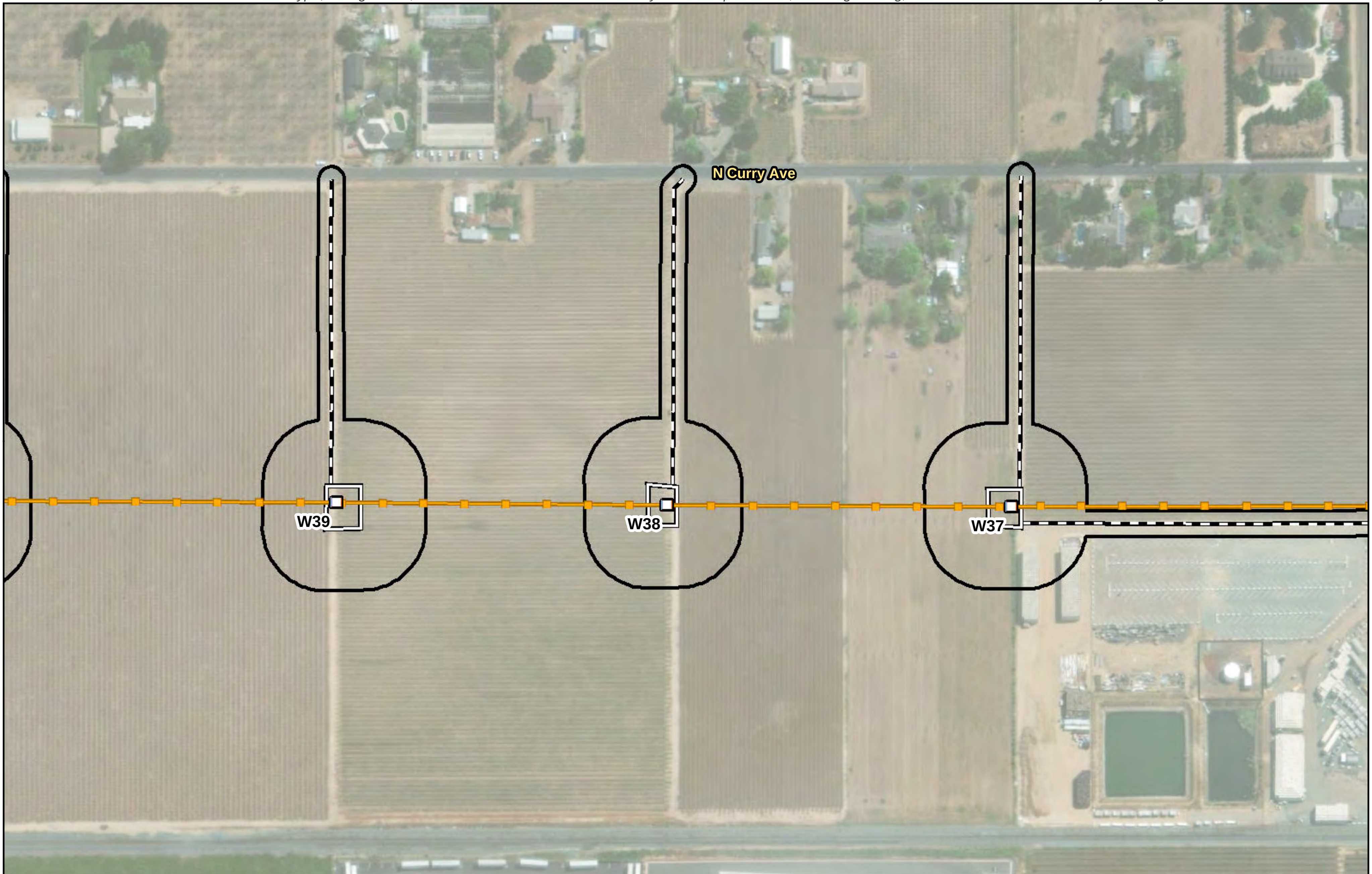

Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
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Proposed Impact Areas

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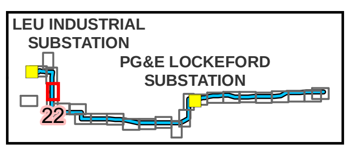

Source:
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Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
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Northern San Joaquin 230 kV Transmission Project

PG&E

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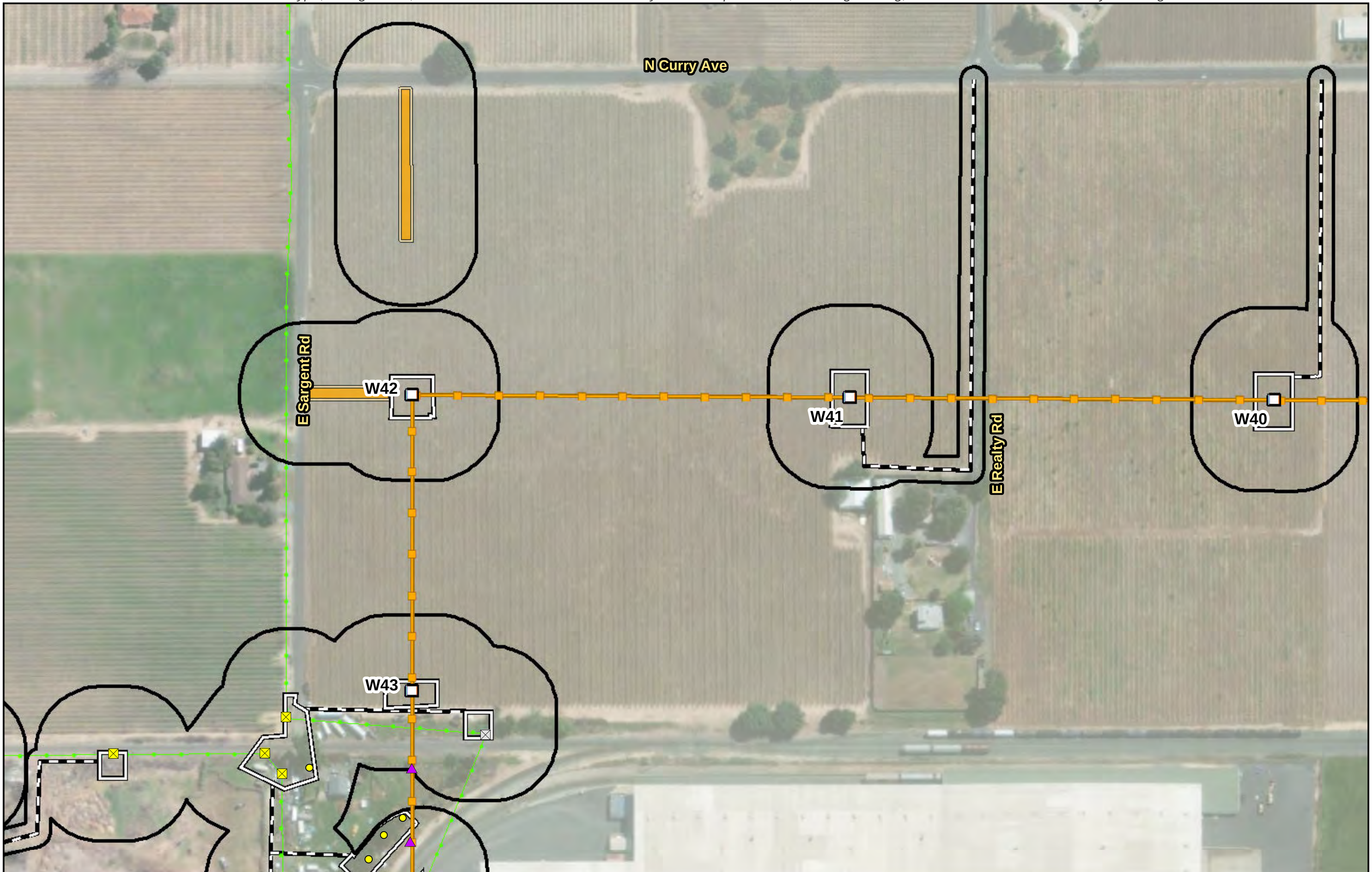

Legend

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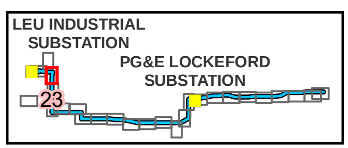

Source:
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0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 23 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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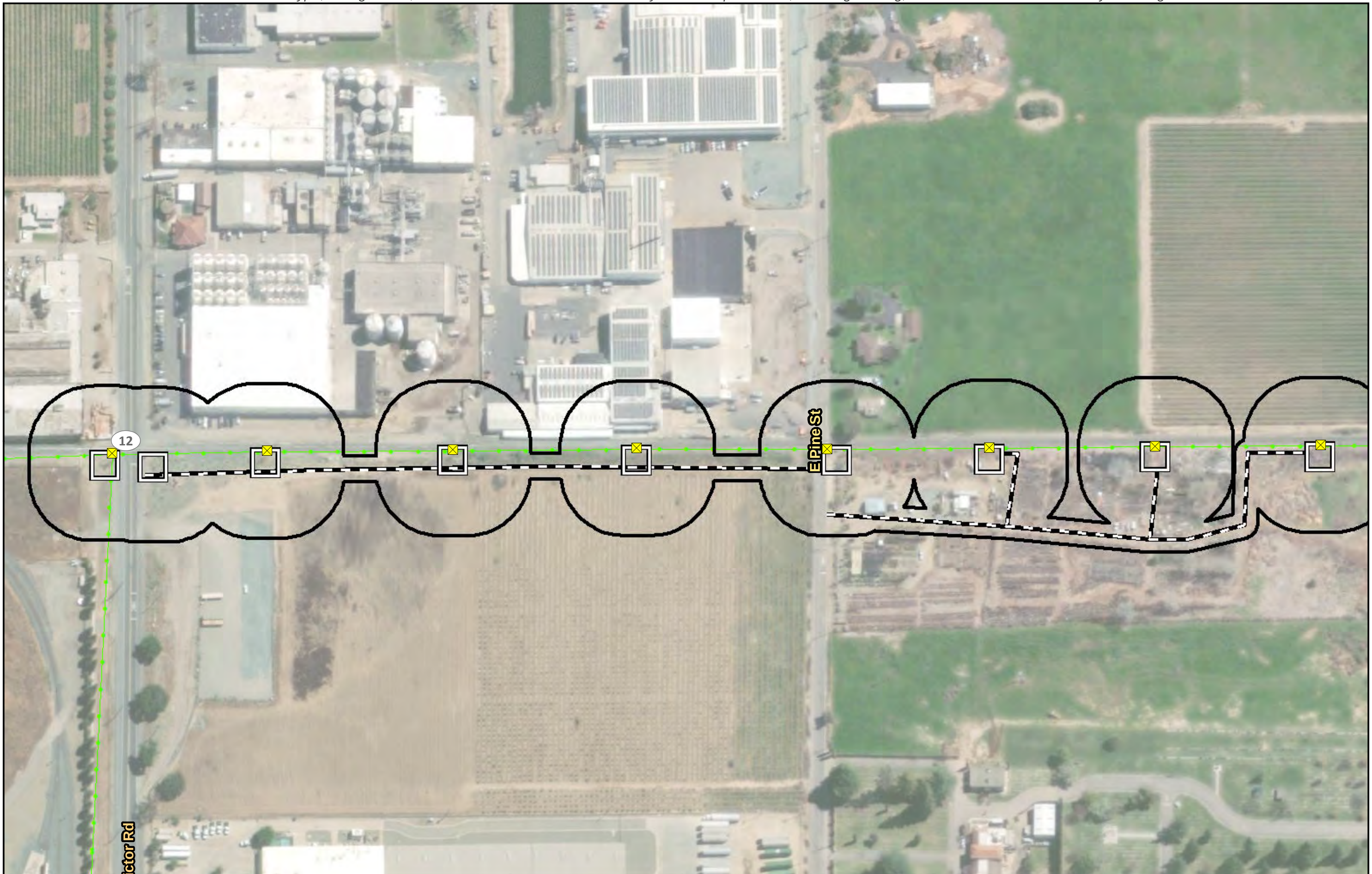

Legend

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Proposed Staging Area

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
24

Source:
1) Esri World Imagery

N

0 100 Feet

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 24 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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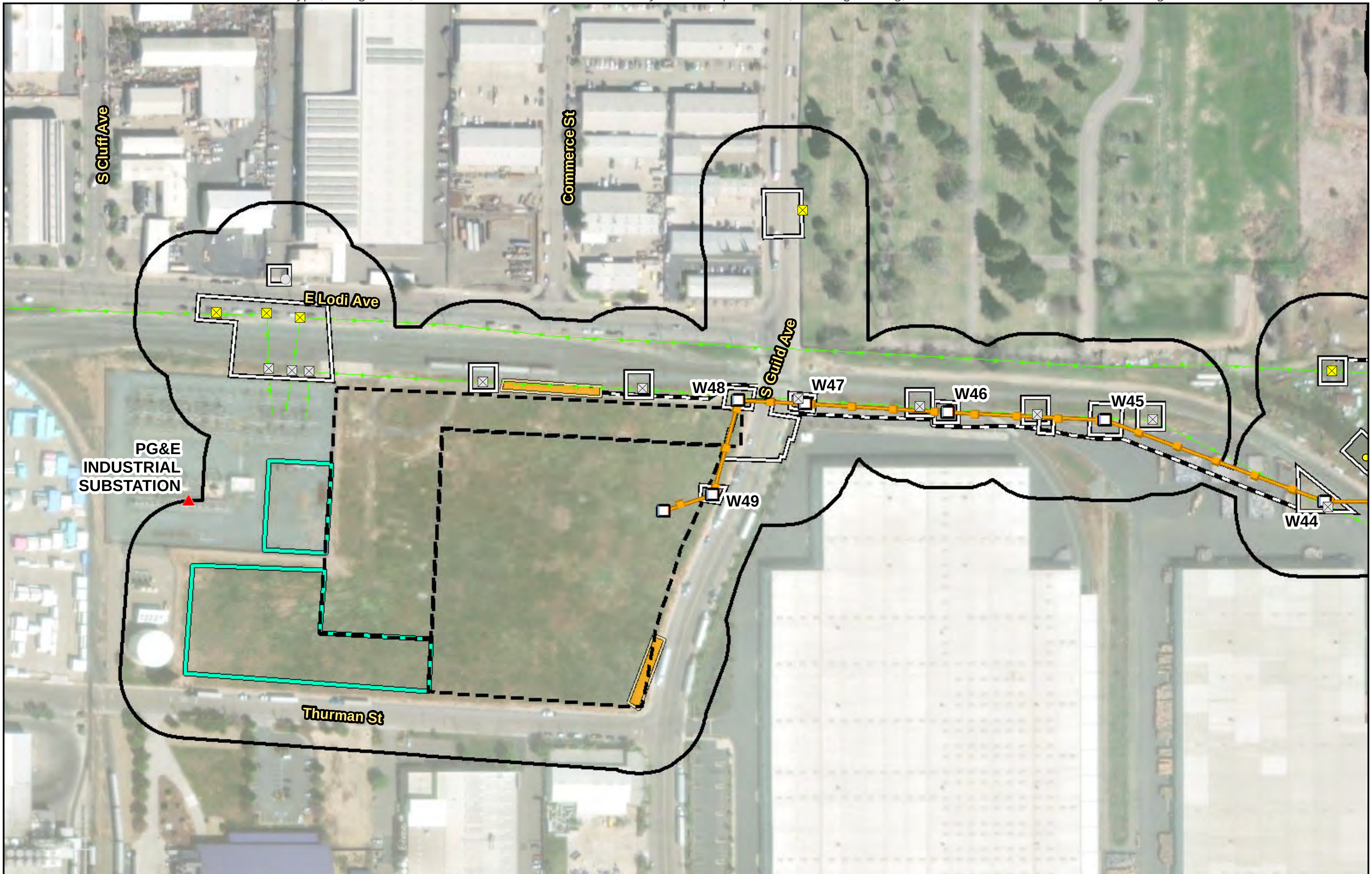

Legend

- Biological Resources Survey Area (387.06 acres)
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LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
25

Source:
1) Esri World Imagery

0 100 Feet

N

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 25 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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Legend

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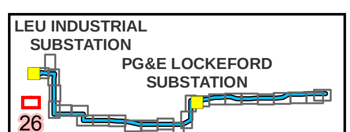
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
1) Esri World Imagery

0 100 Feet

N

Scale: 1:3,000

FIGURE 2
Project Elements and Biological Resources Survey Area
Page 26 of 26
Northern San Joaquin 230 kV Transmission Project

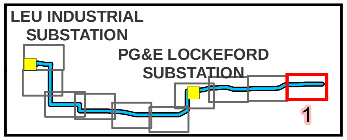
Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 1 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

Preliminary design and engineering for the physical, civil, and outdoor components.
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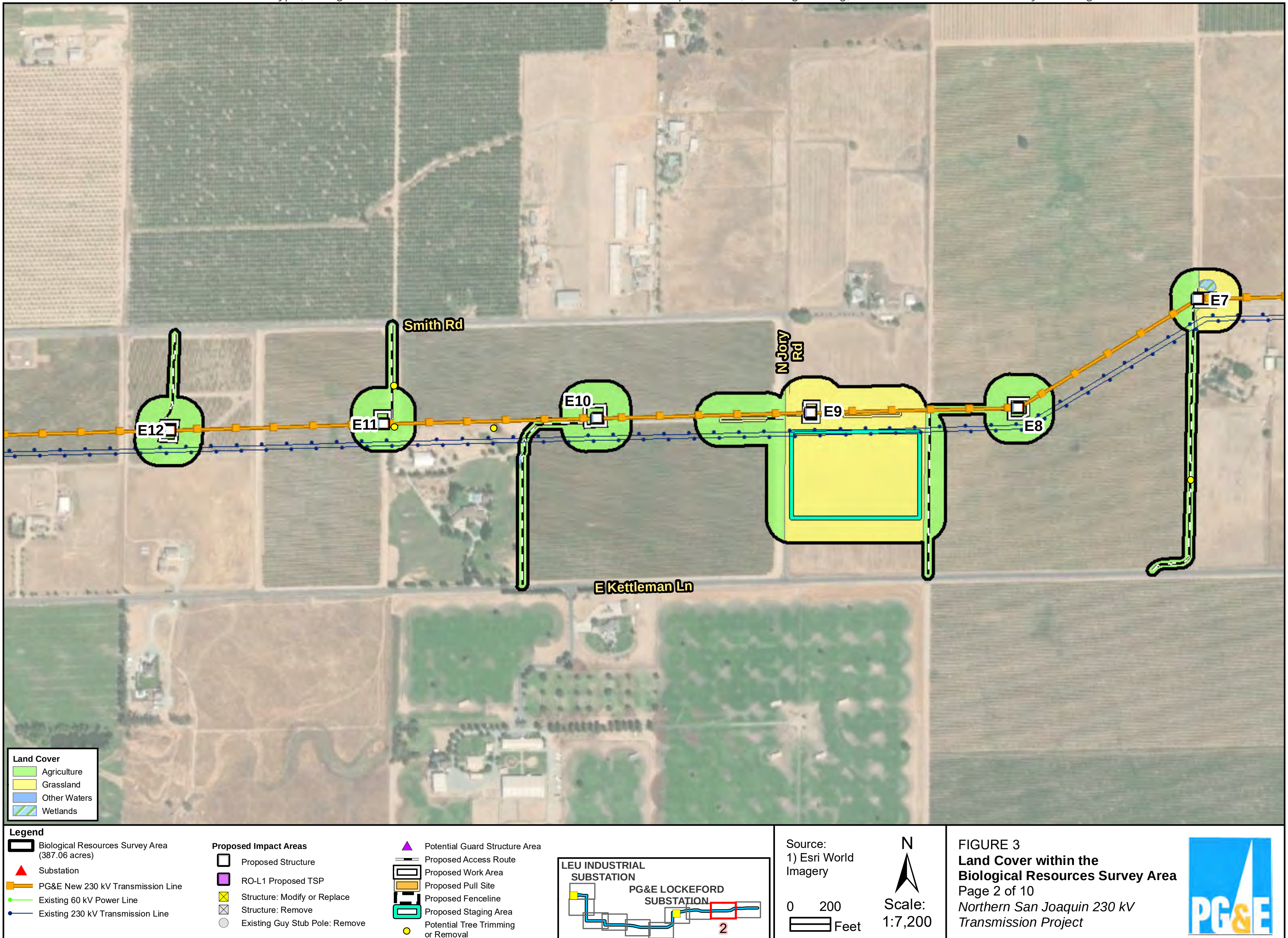

Source:
1) Esri World Imagery

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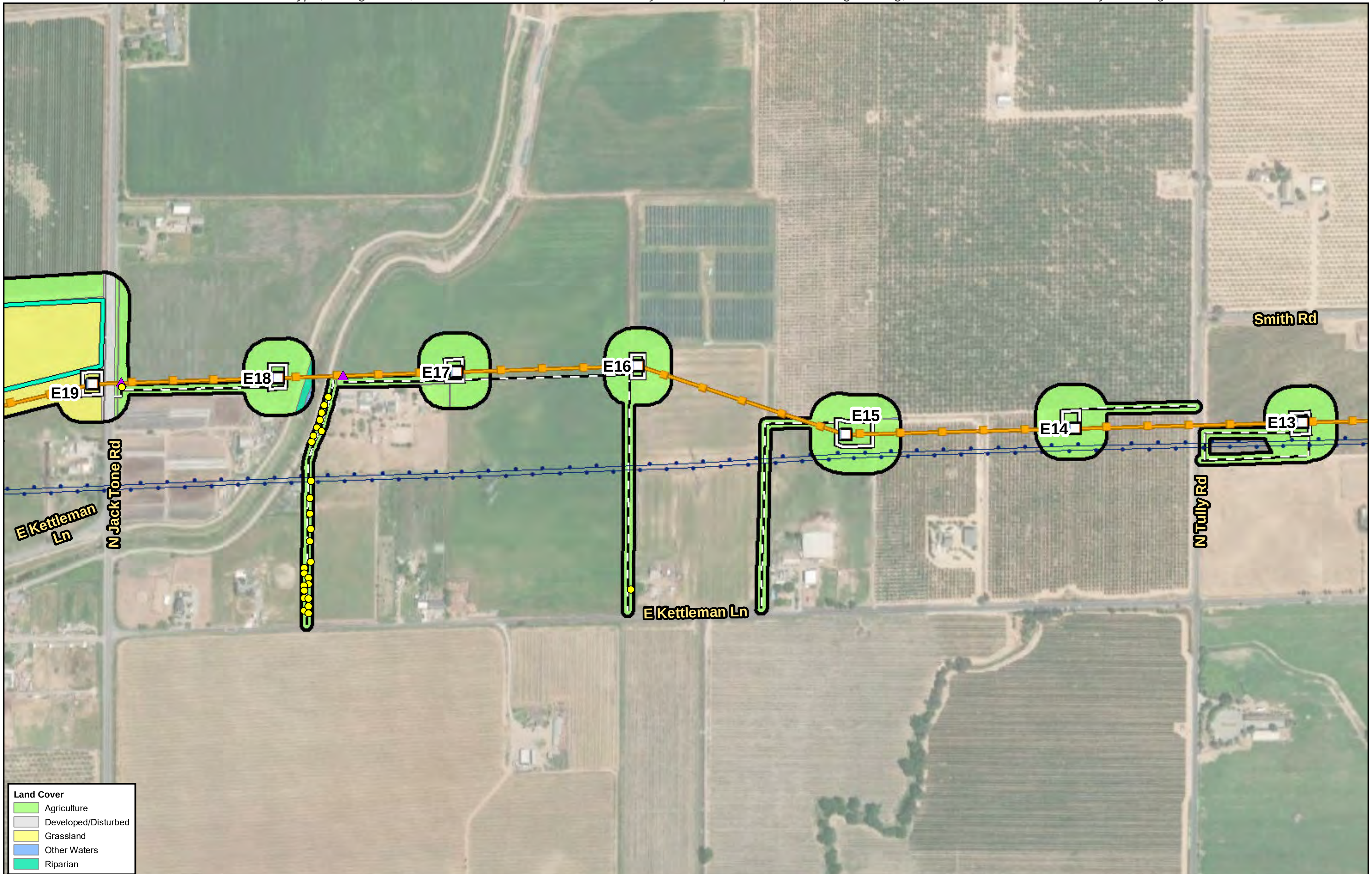
Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 2 of 10
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

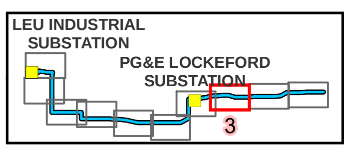


Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 3 of 10
Northern San Joaquin 230 kV Transmission Project

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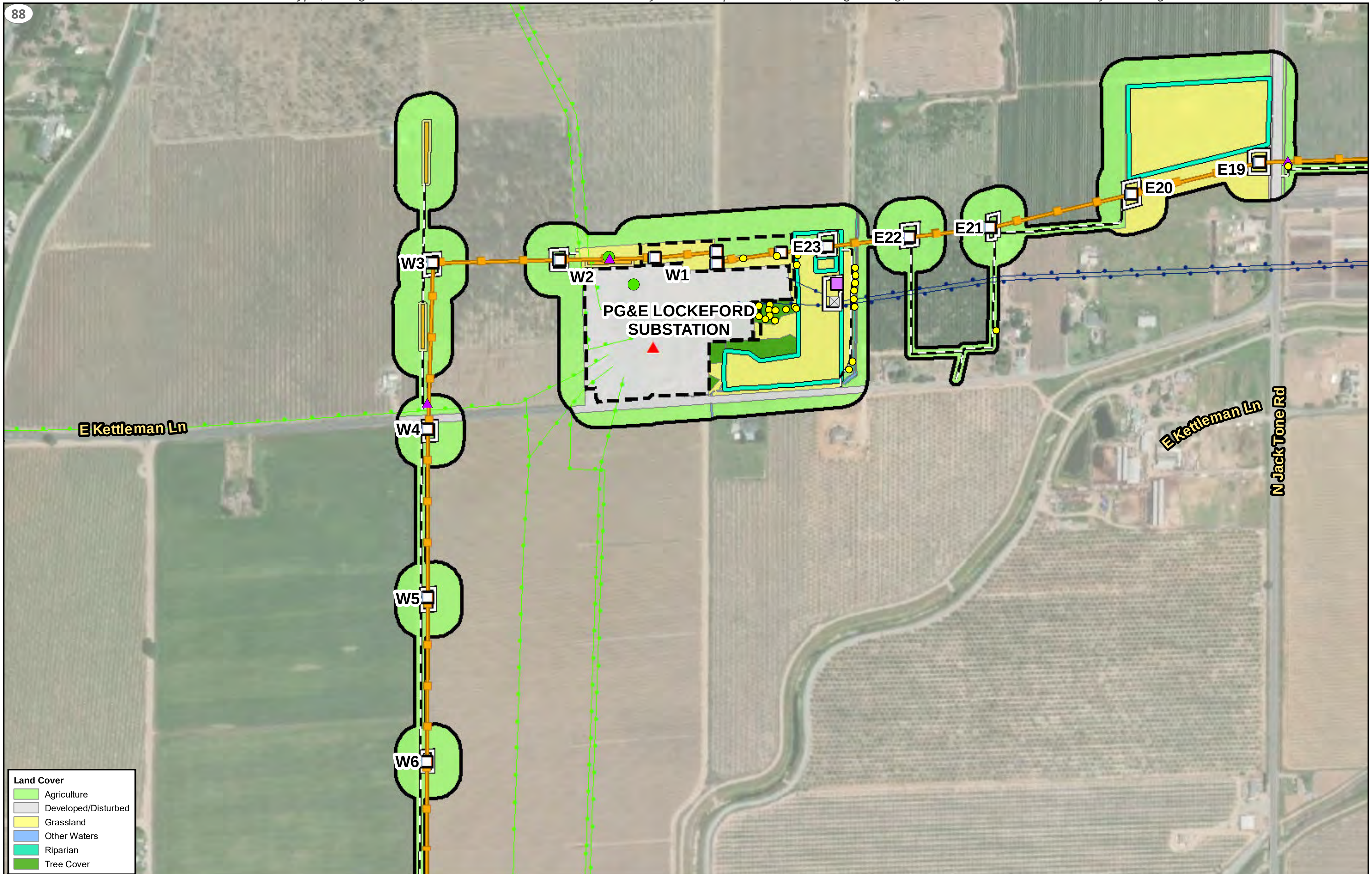

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal
- Elderberry Shrubs

LEU INDUSTRIAL SUBSTATION
PG&E LOCKEFORD SUBSTATION
4

Source:
1) Esri World Imagery

0 200 Feet

N

Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 4 of 10
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

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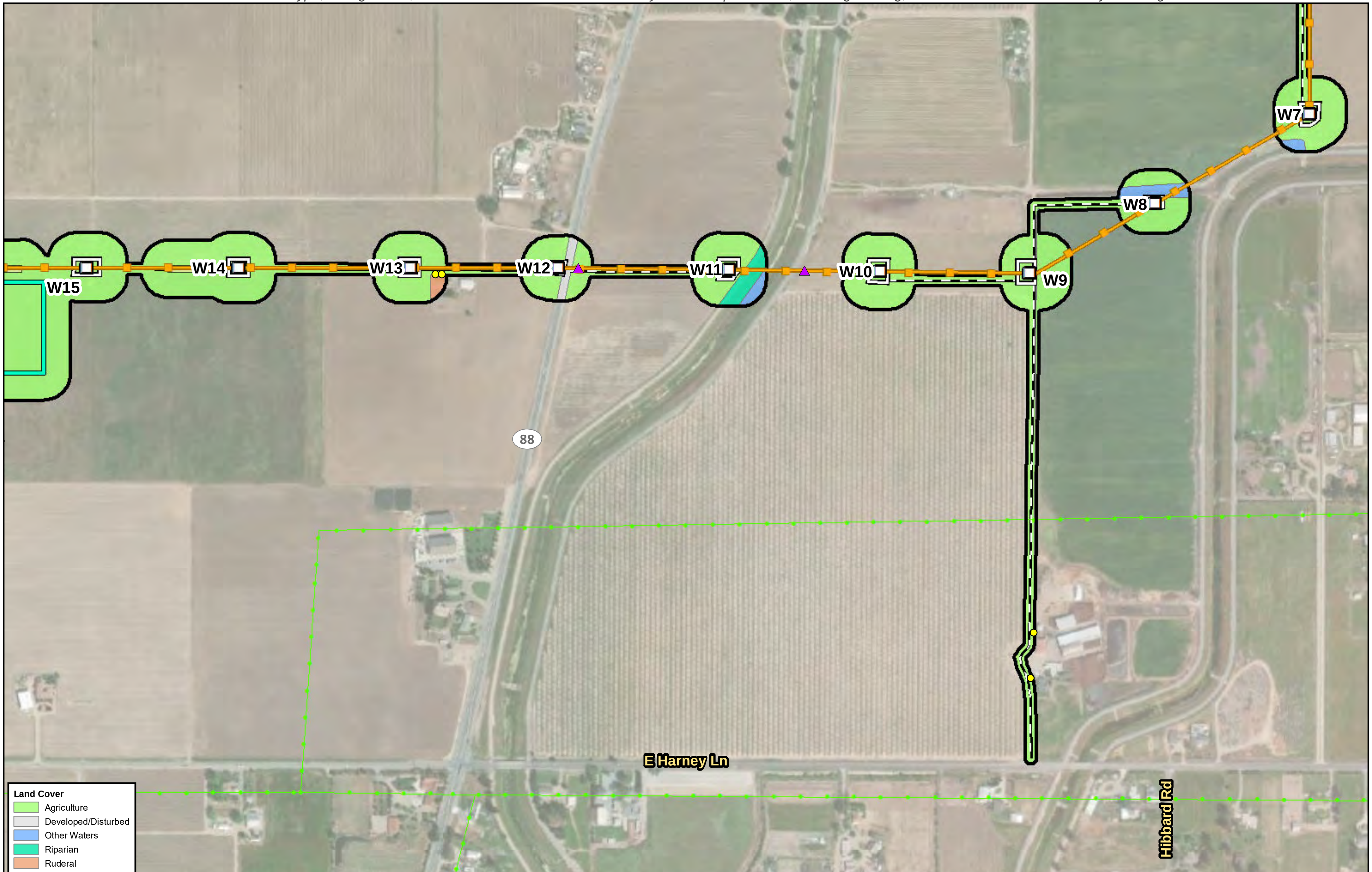
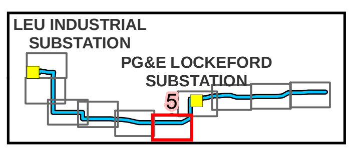


Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

0 200 Feet

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 5 of 10
Northern San Joaquin 230 kV Transmission Project

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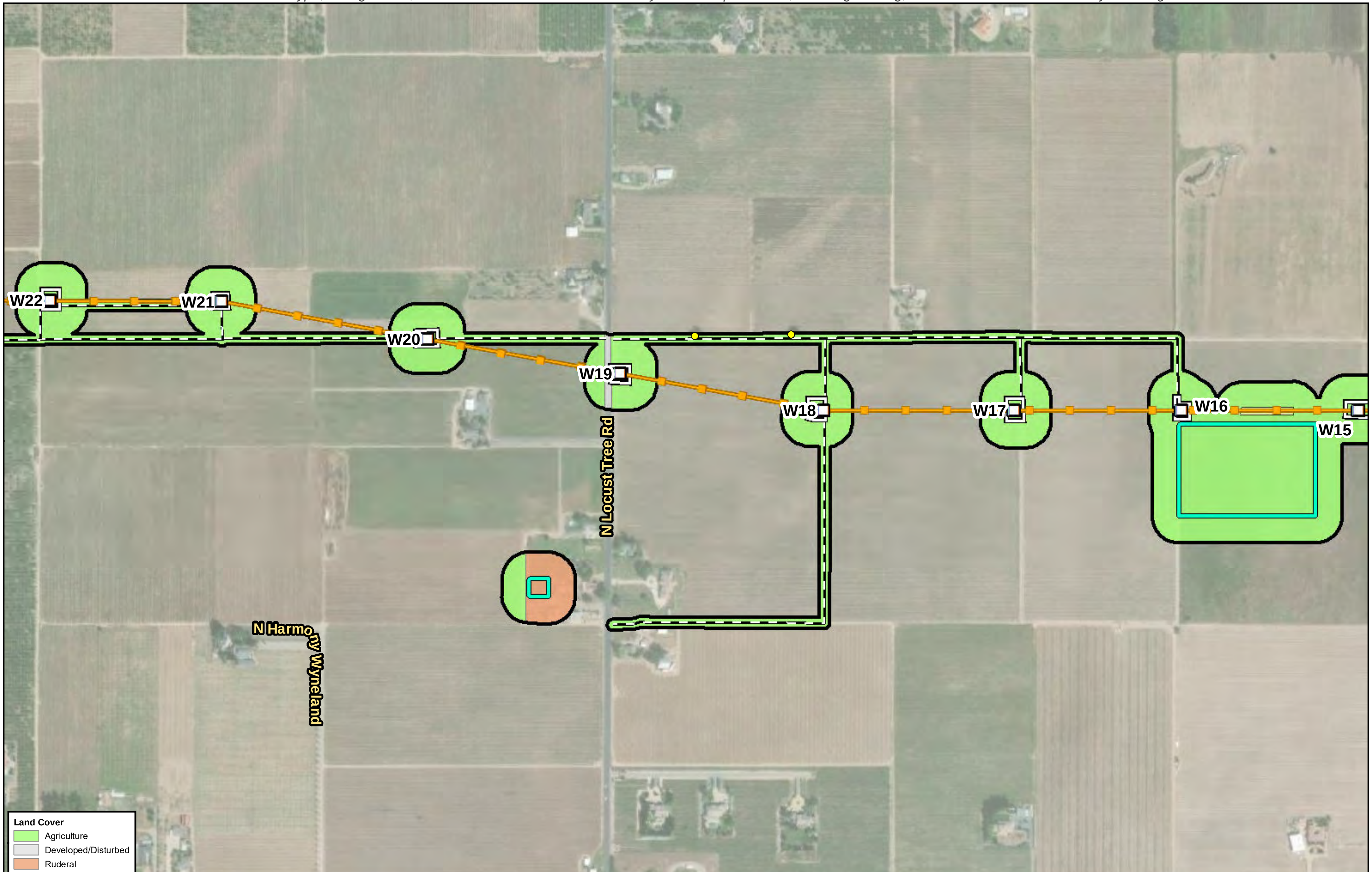
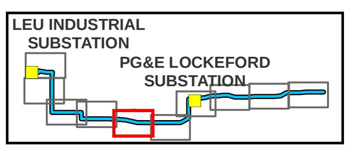


Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas
Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove

Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area
Potential Tree Trimming or Removal



Source:
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0 200 Feet

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 6 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

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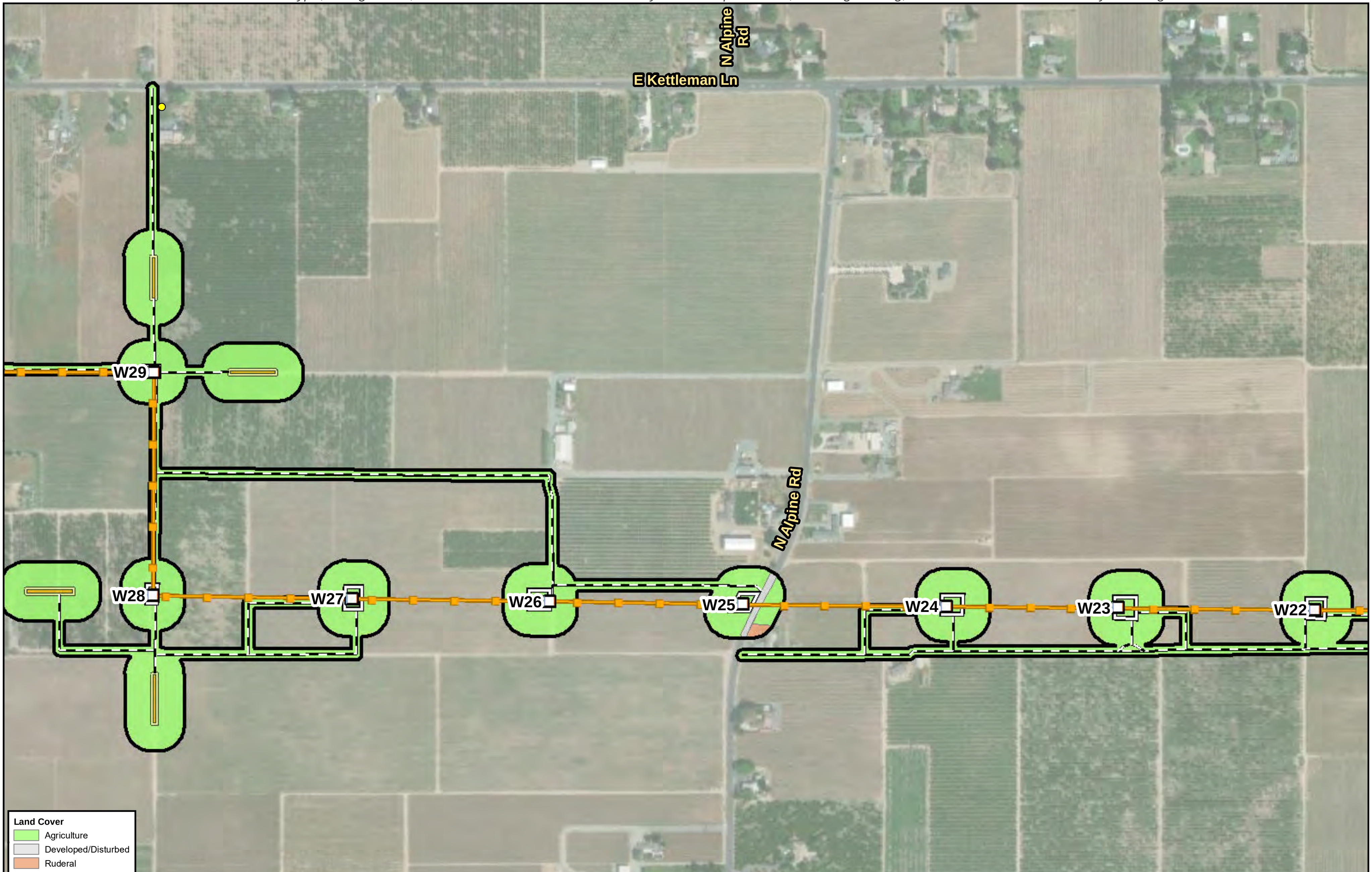
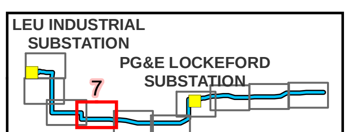


Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 7 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

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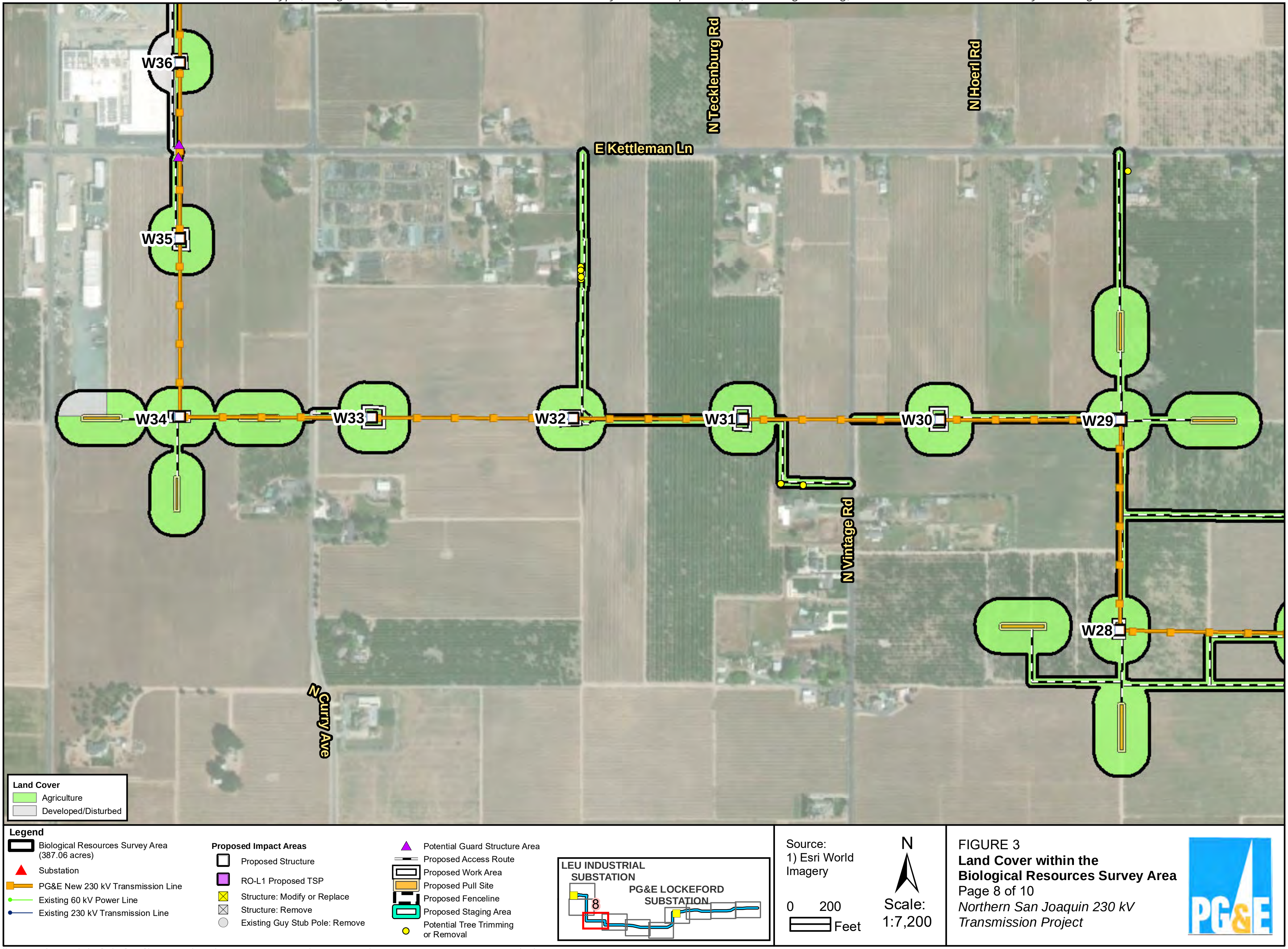

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 8 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

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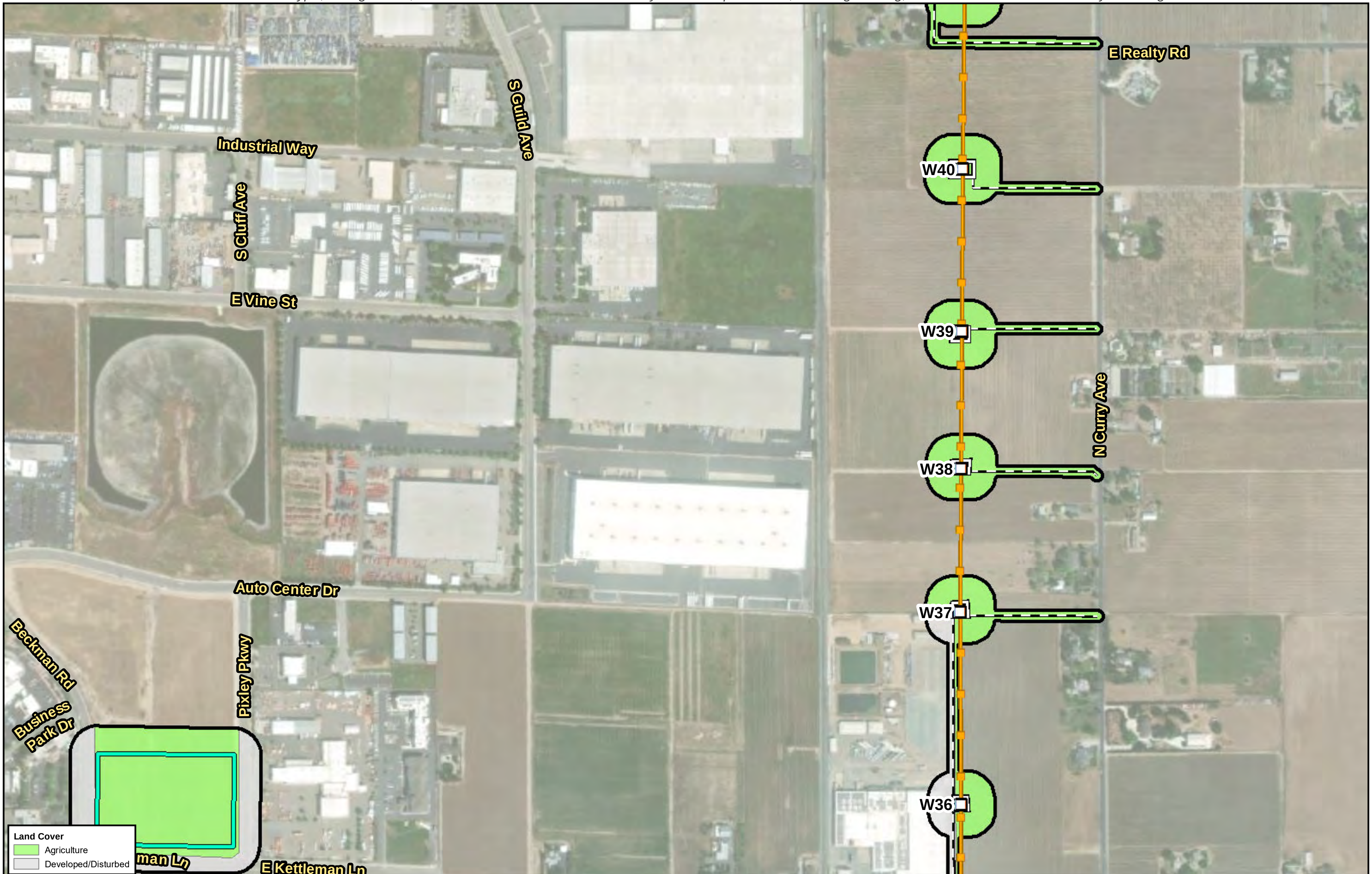
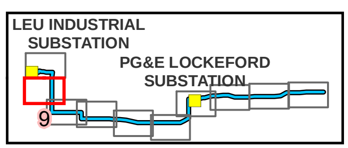


Legend
- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas
- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area



Source:
1) Esri World Imagery

0 200 Feet

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Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 9 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023

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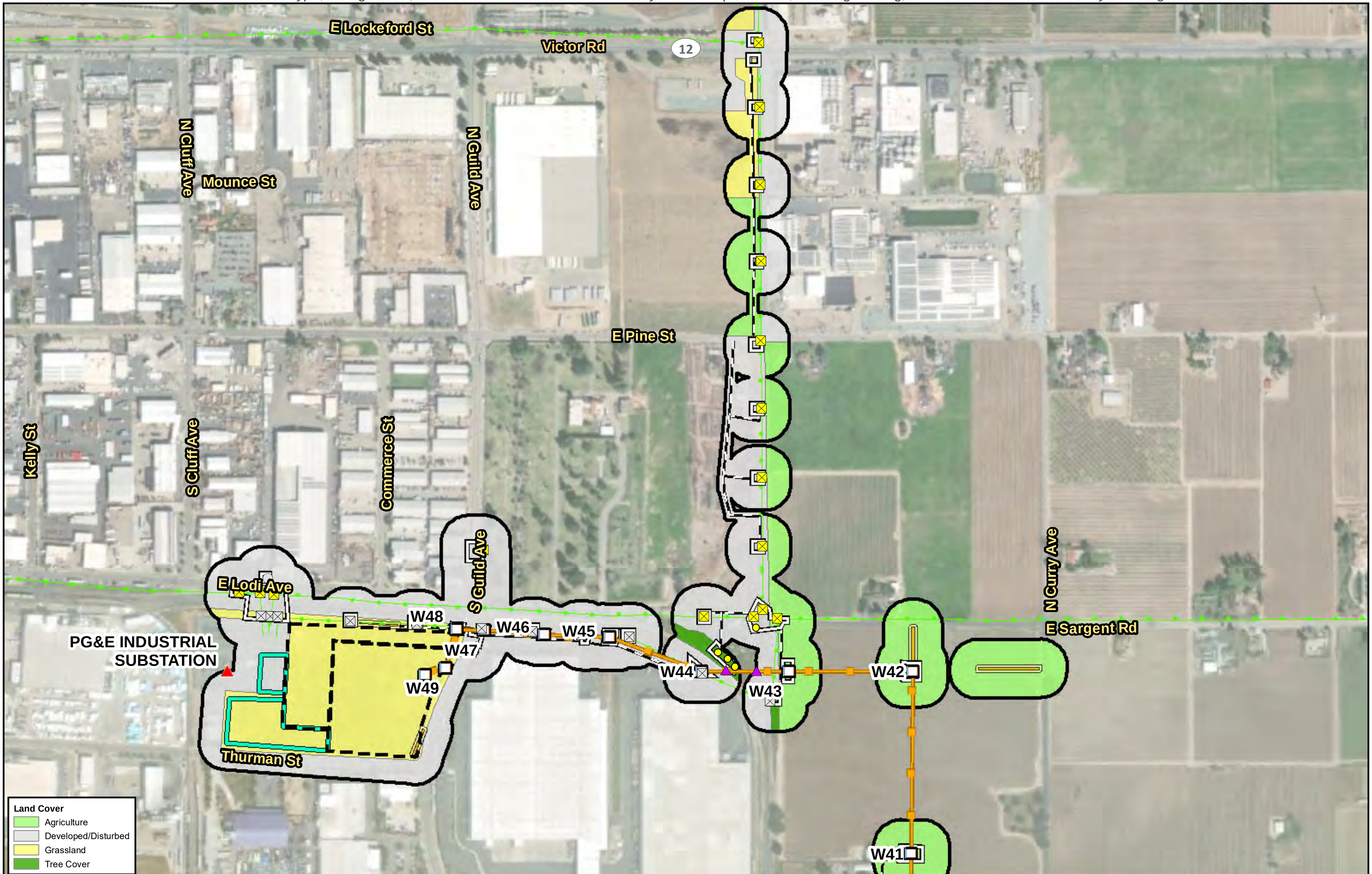
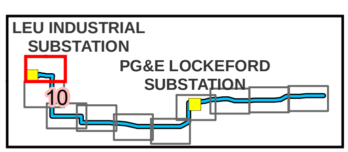


Legend
- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas
- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Potential Tree Trimming or Removal



Source:
1) Esri World Imagery

0 200 Feet

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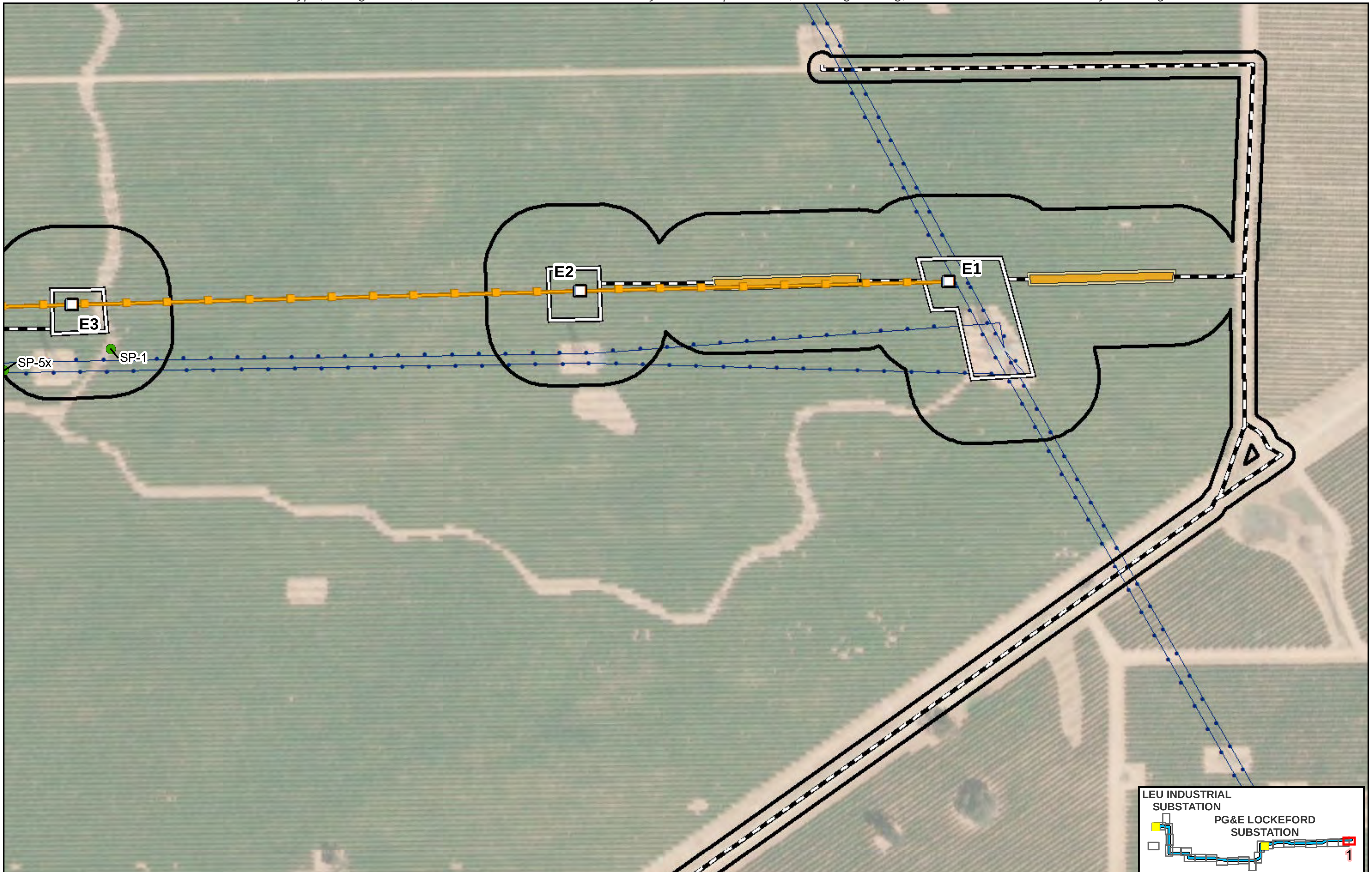
Scale: 1:7,200

FIGURE 3
Land Cover within the Biological Resources Survey Area
Page 10 of 10
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_3_230818.mxd kgrant1 8/21/2023



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Wetland Sample Point

Source:
1) Esri World Imagery

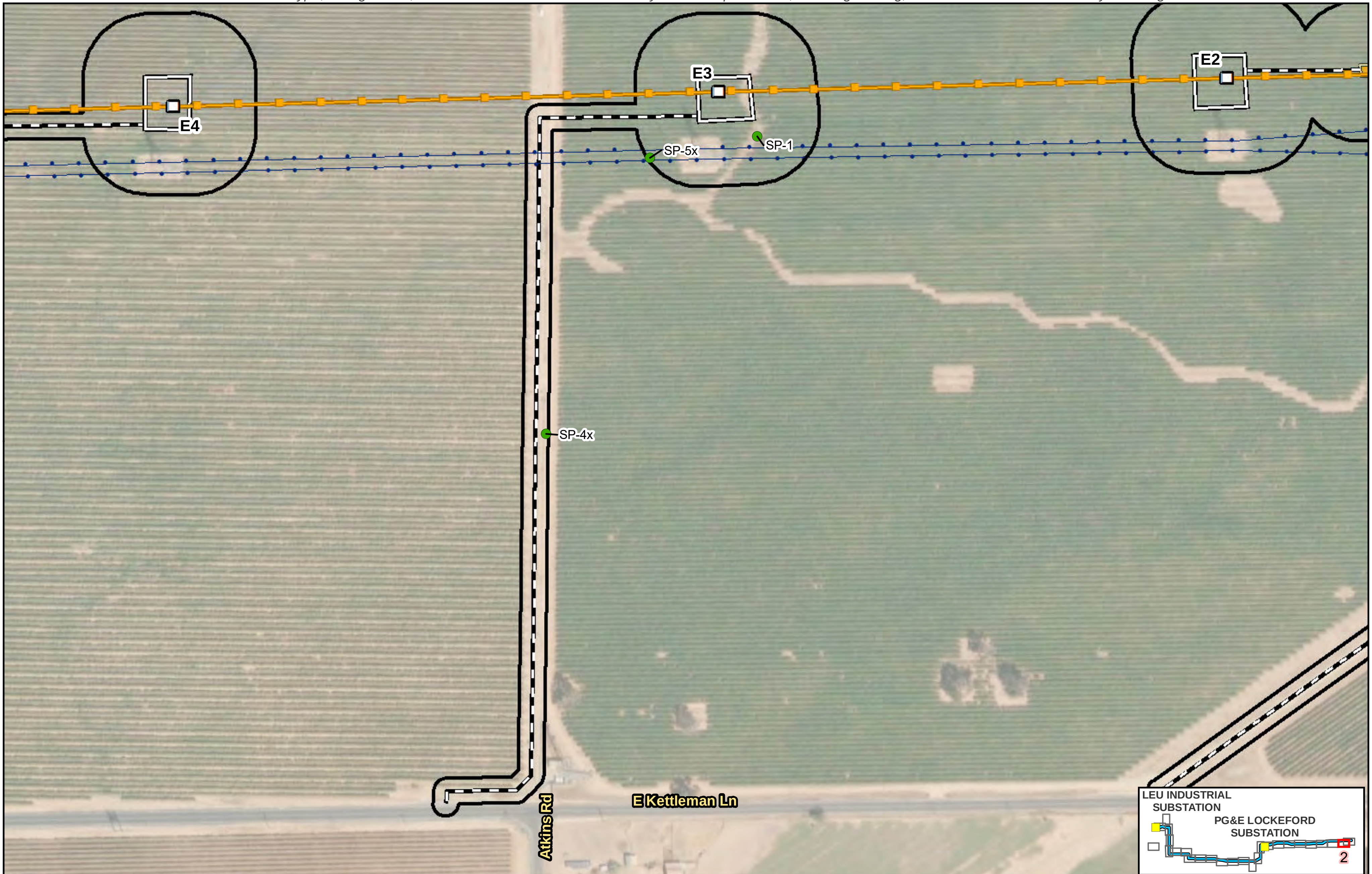
N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 1 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Wetland Sample Point

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 2 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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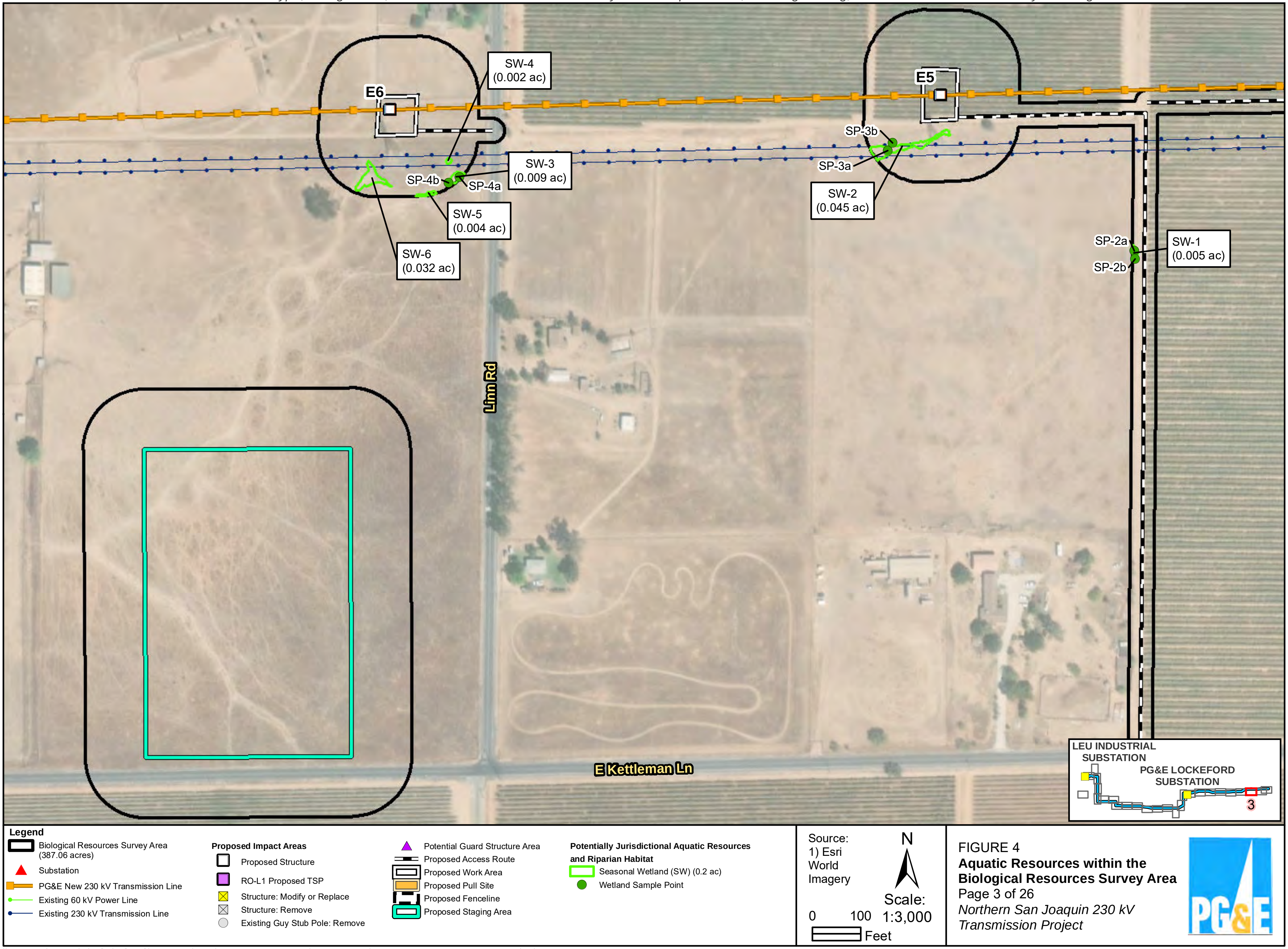

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 3 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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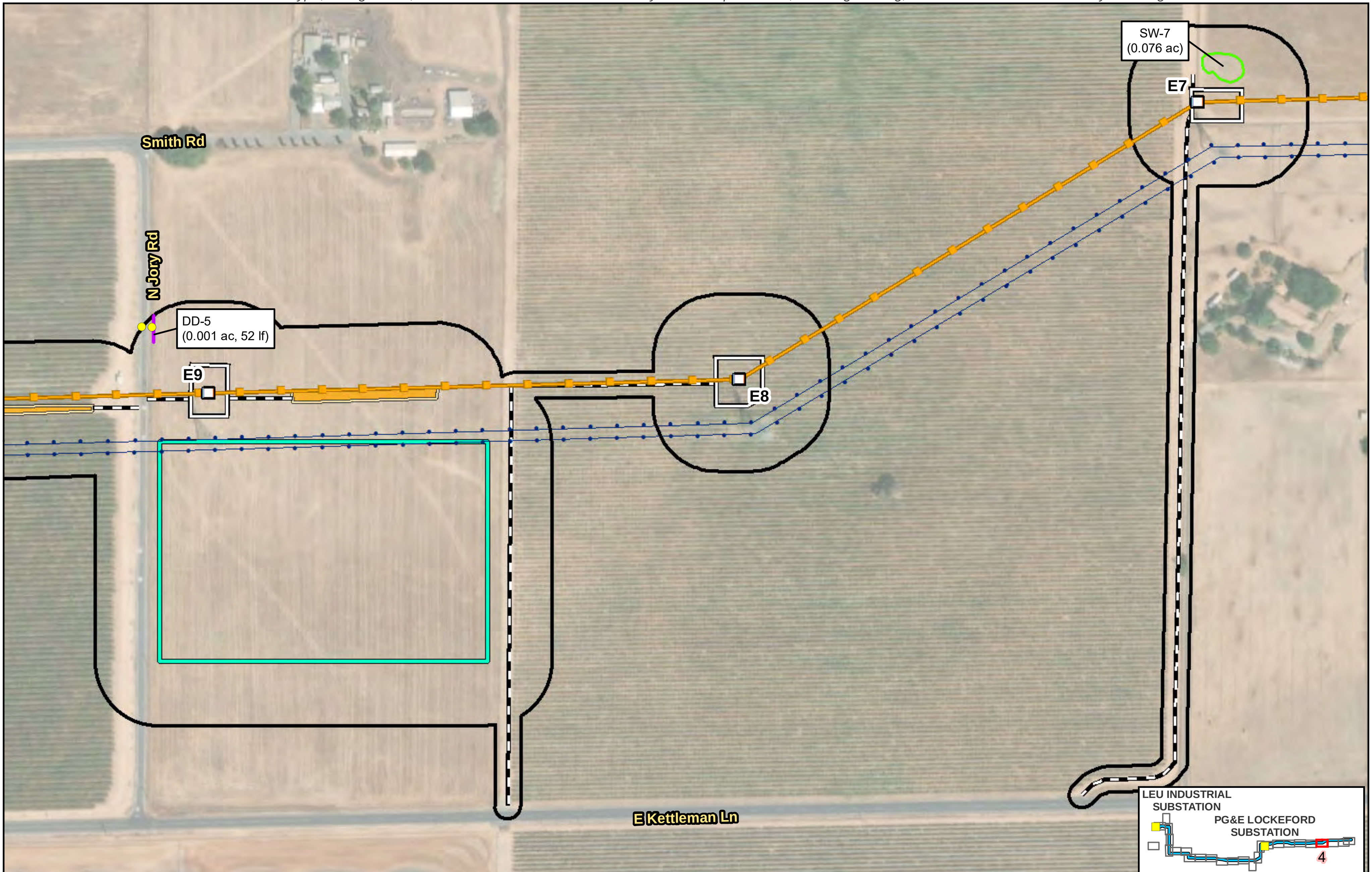


Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

Seasonal Wetland (SW) (0.2 ac)
Drainage Ditch (DD) (0.127 ac, 1,805 lf)
Culvert

Source:
1) Esri World Imagery

N

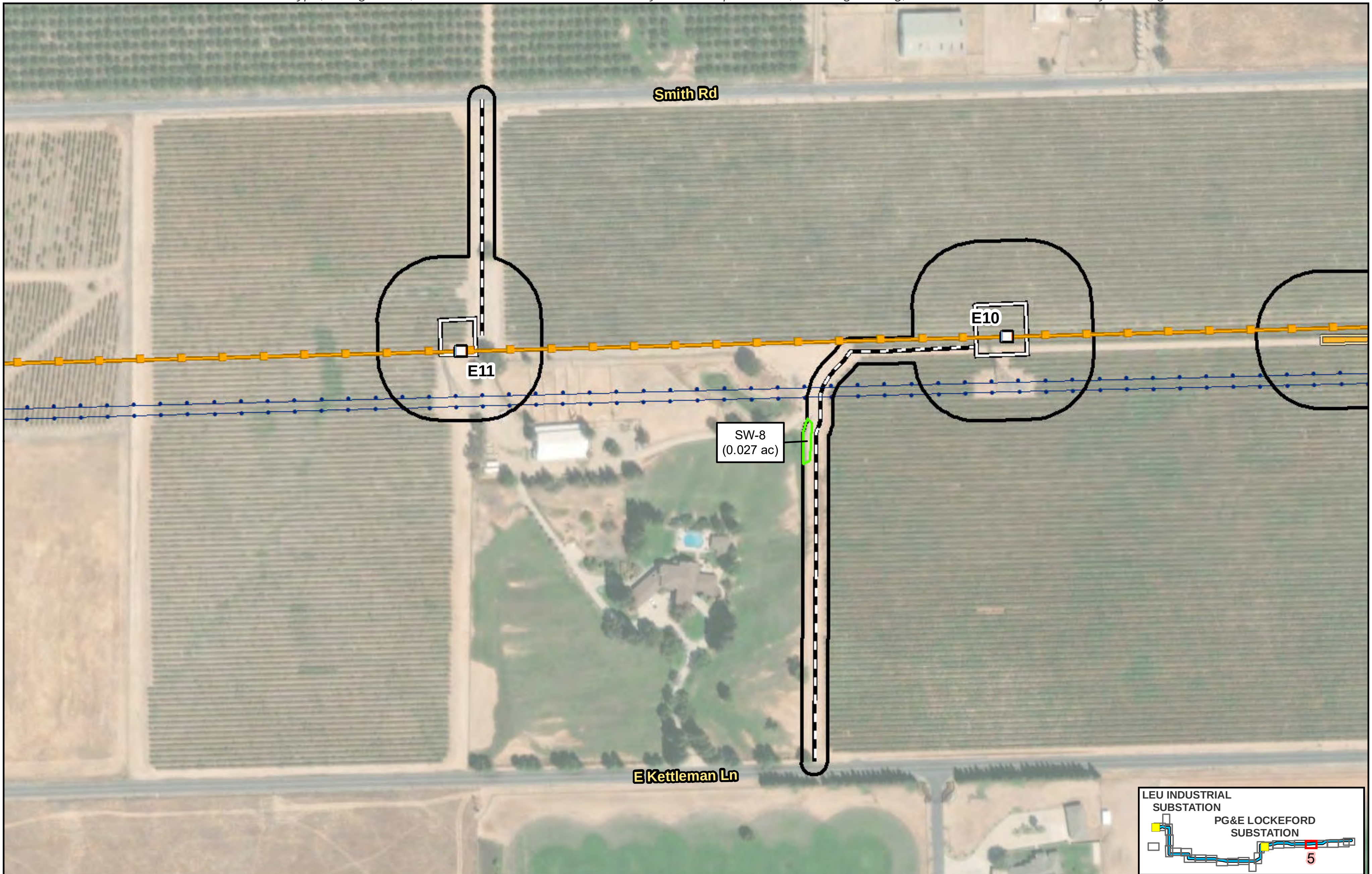
Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 4 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Seasonal Wetland (SW) (0.2 ac)

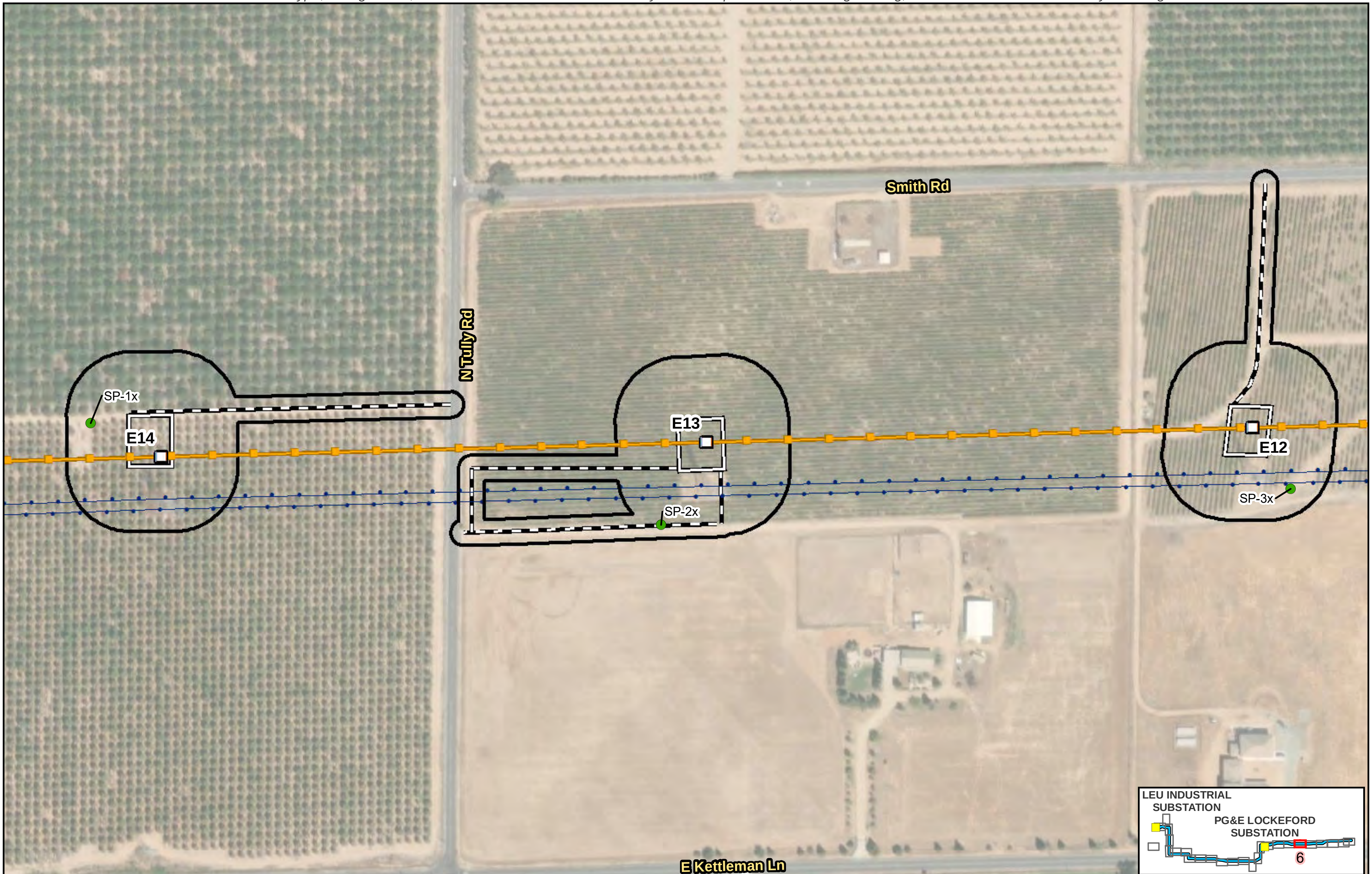
Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 5 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Wetland Sample Point

Source:
1) Esri World Imagery

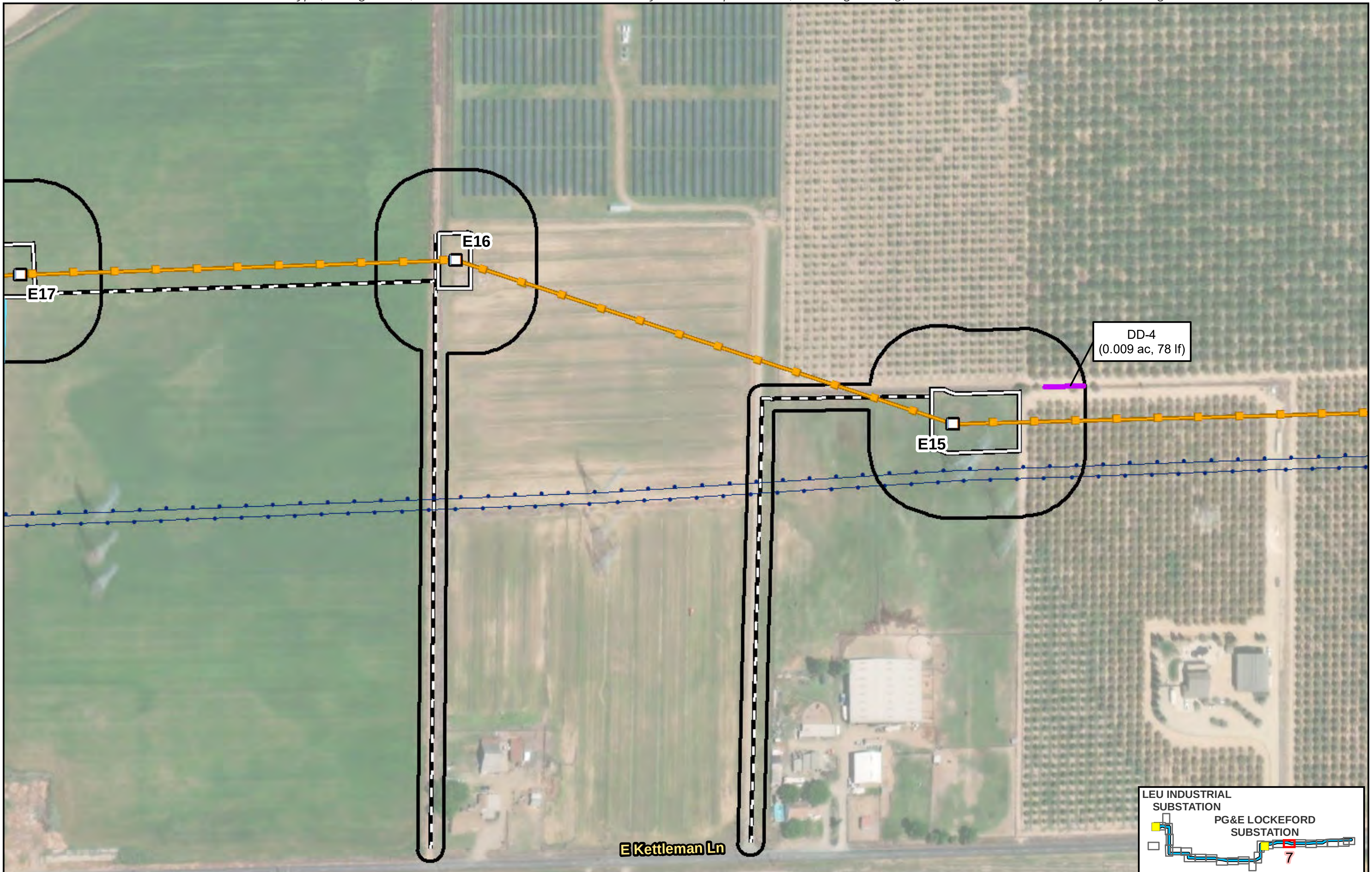
N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 6 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Drainage Ditch (DD) (0.127 ac, 1,805 lf)

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 7 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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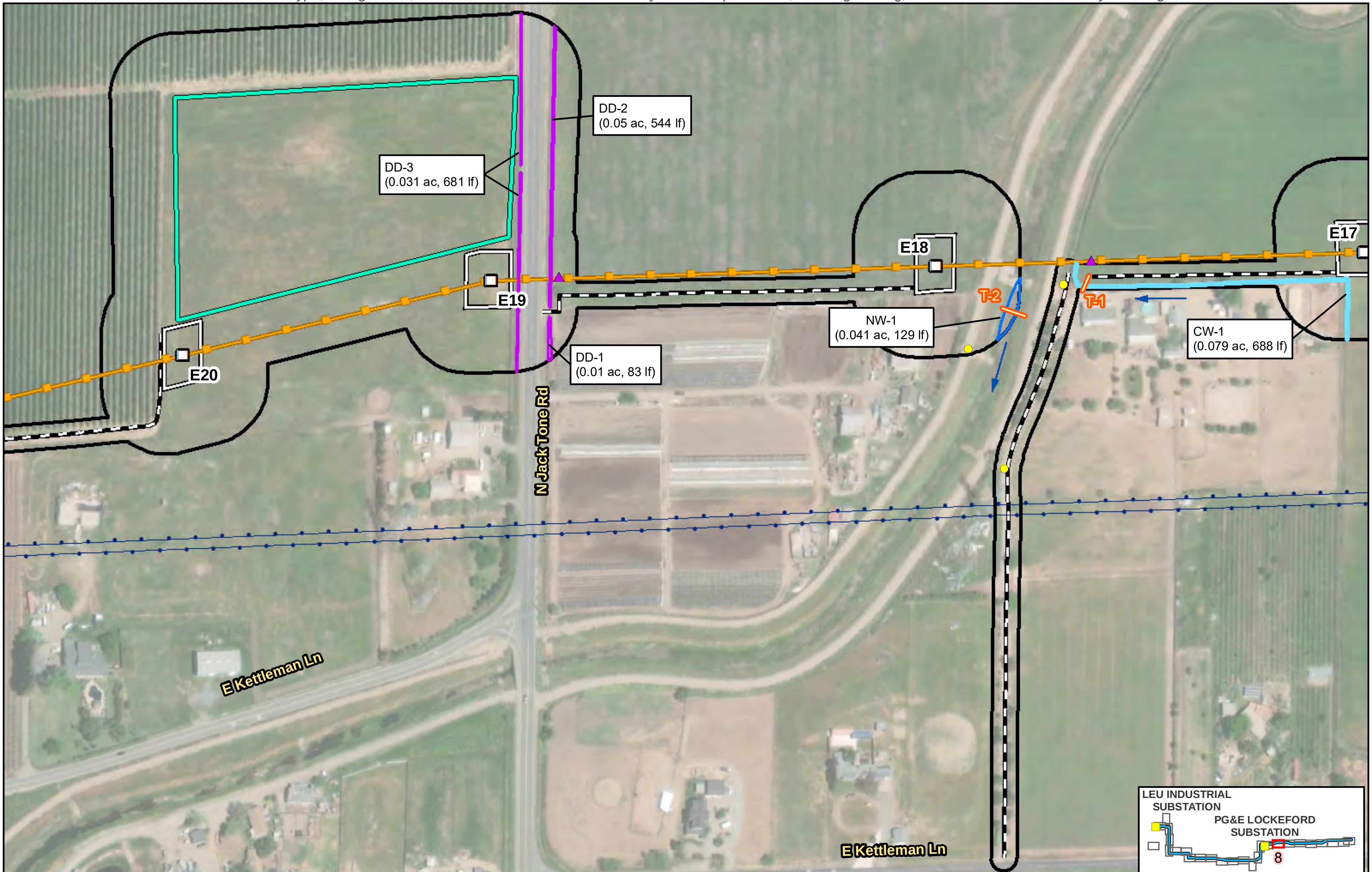

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Natural Watercourse (NW) (0.247 ac, 359 lf)
- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Drainage Ditch (DD) (0.127 ac, 1,805 lf)
- Culvert
- Flow Direction
- Transect

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 8 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

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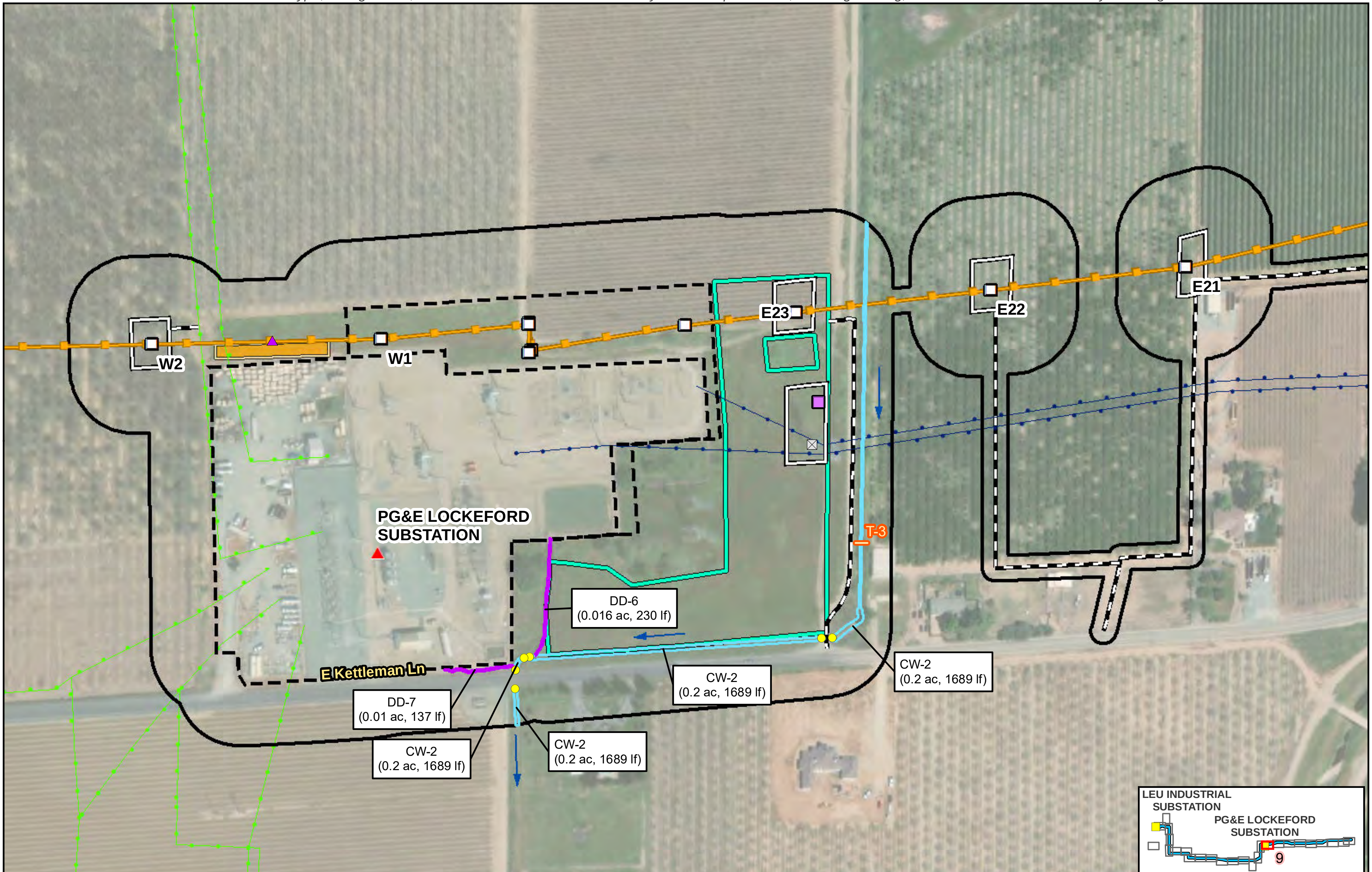


Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
RO-L1 Proposed TSP
Structure: Modify or Replace
Structure: Remove
Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
Drainage Ditch (DD) (0.127 ac, 1,805 lf)
Culvert
Flow Direction
Transect

Source:
1) Esri World Imagery

N

Scale: 1:3,000

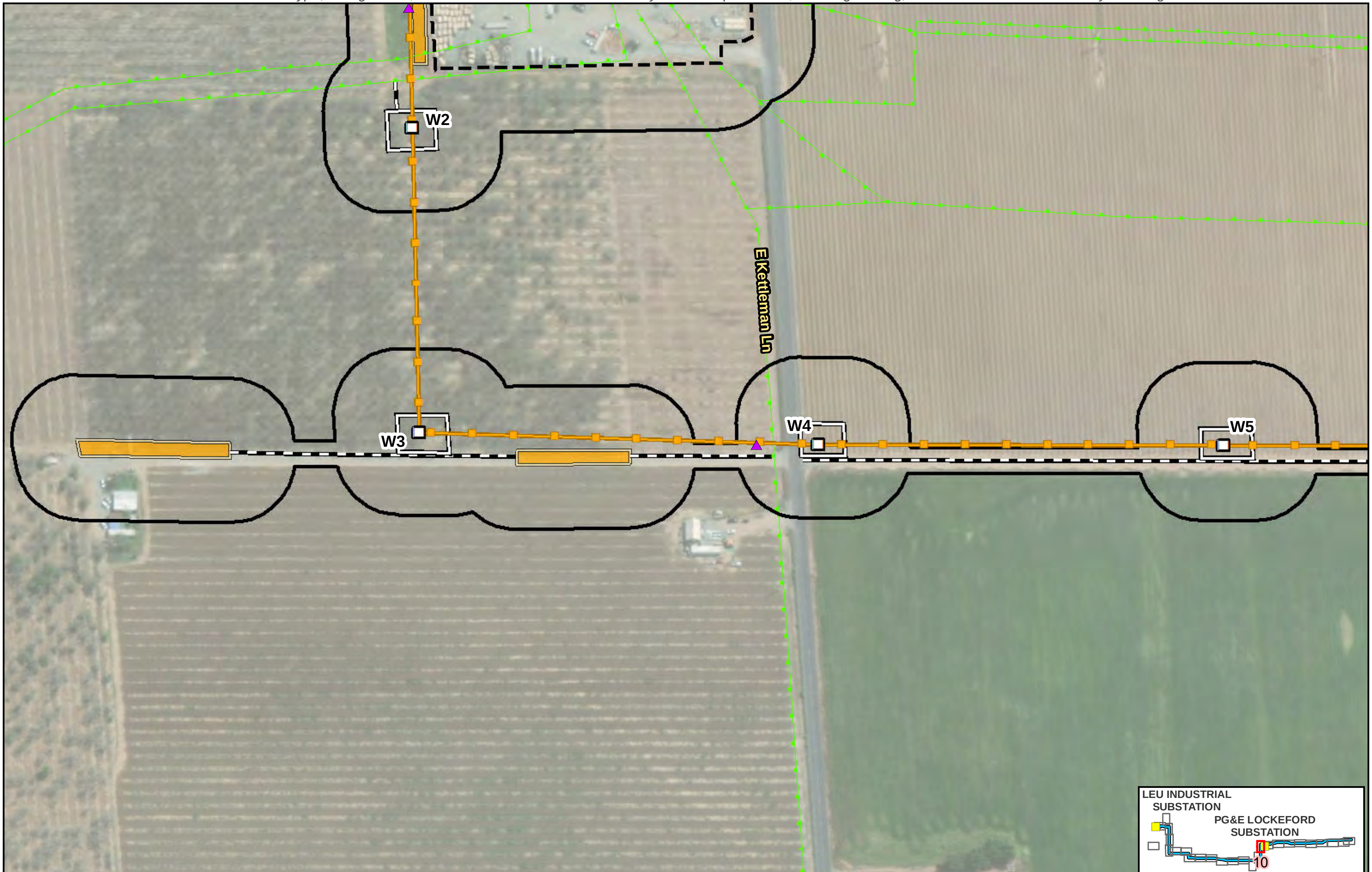
0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 9 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

Preliminary design and engineering for the physical, civil, and outdoor components.
Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.



Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
- Existing 230 kV Transmission Line

Proposed Impact Areas

- Proposed Structure
- RO-L1 Proposed TSP
- Structure: Modify or Replace
- Structure: Remove
- Existing Guy Stub Pole: Remove
- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 10 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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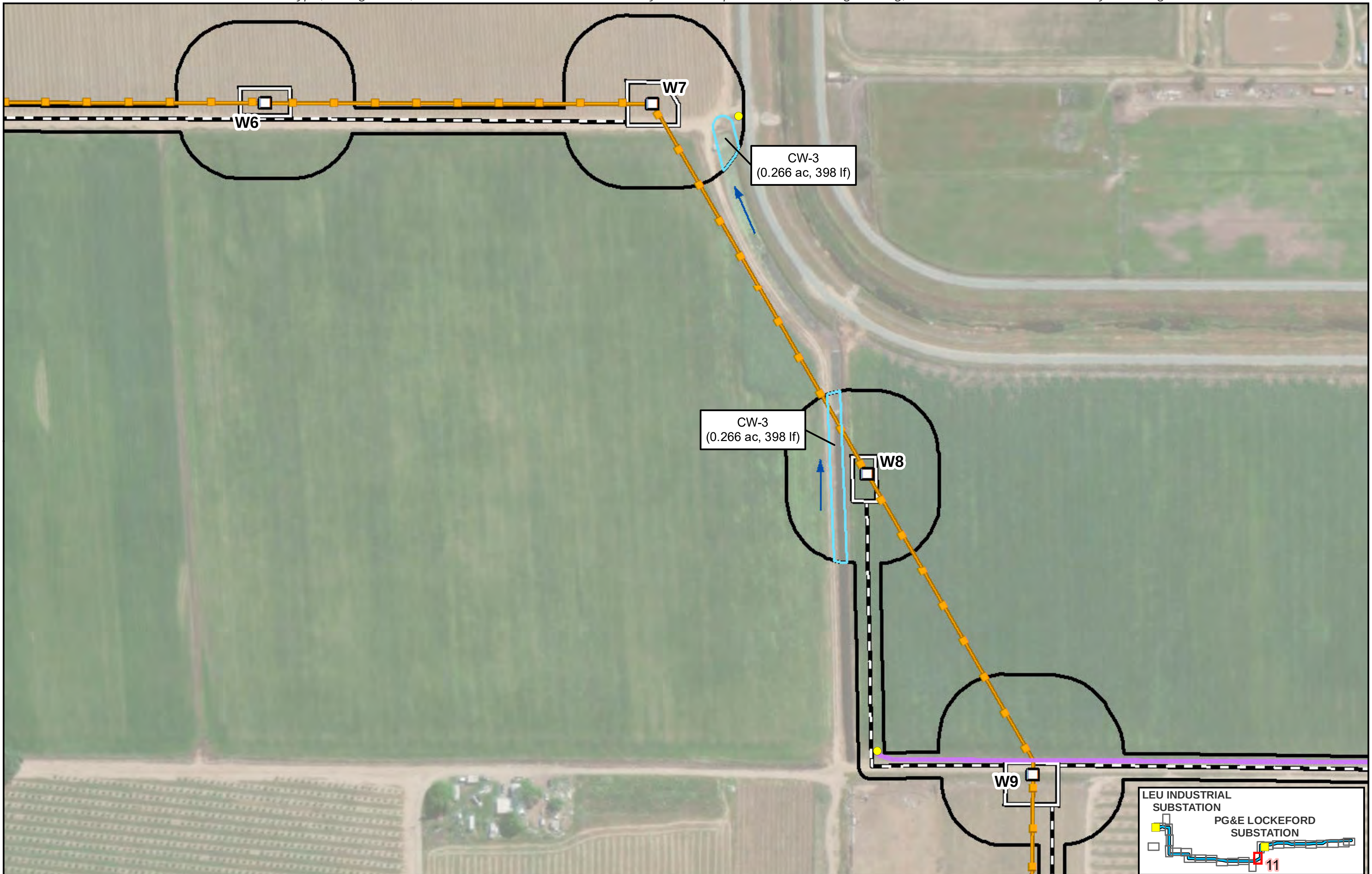

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
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Proposed Impact Areas

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- Potential Guard Structure Area
- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Constructed Watercourse (CW) (0.545 ac, 2,775 lf)
- Irrigation Ditch (ID) (0.152 ac, 1,654 lf)
- Culvert
- Flow Direction

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 11 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are likely to change.

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
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Proposed Impact Areas

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- Proposed Access Route
- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Potentially Jurisdictional Aquatic Resources and Riparian Habitat

- Natural Watercourse (NW) (0.247 ac, 359 lf)
- Irrigation Ditch (ID) (0.152 ac, 1,654 lf)
- Flow Direction
- Transect

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 12 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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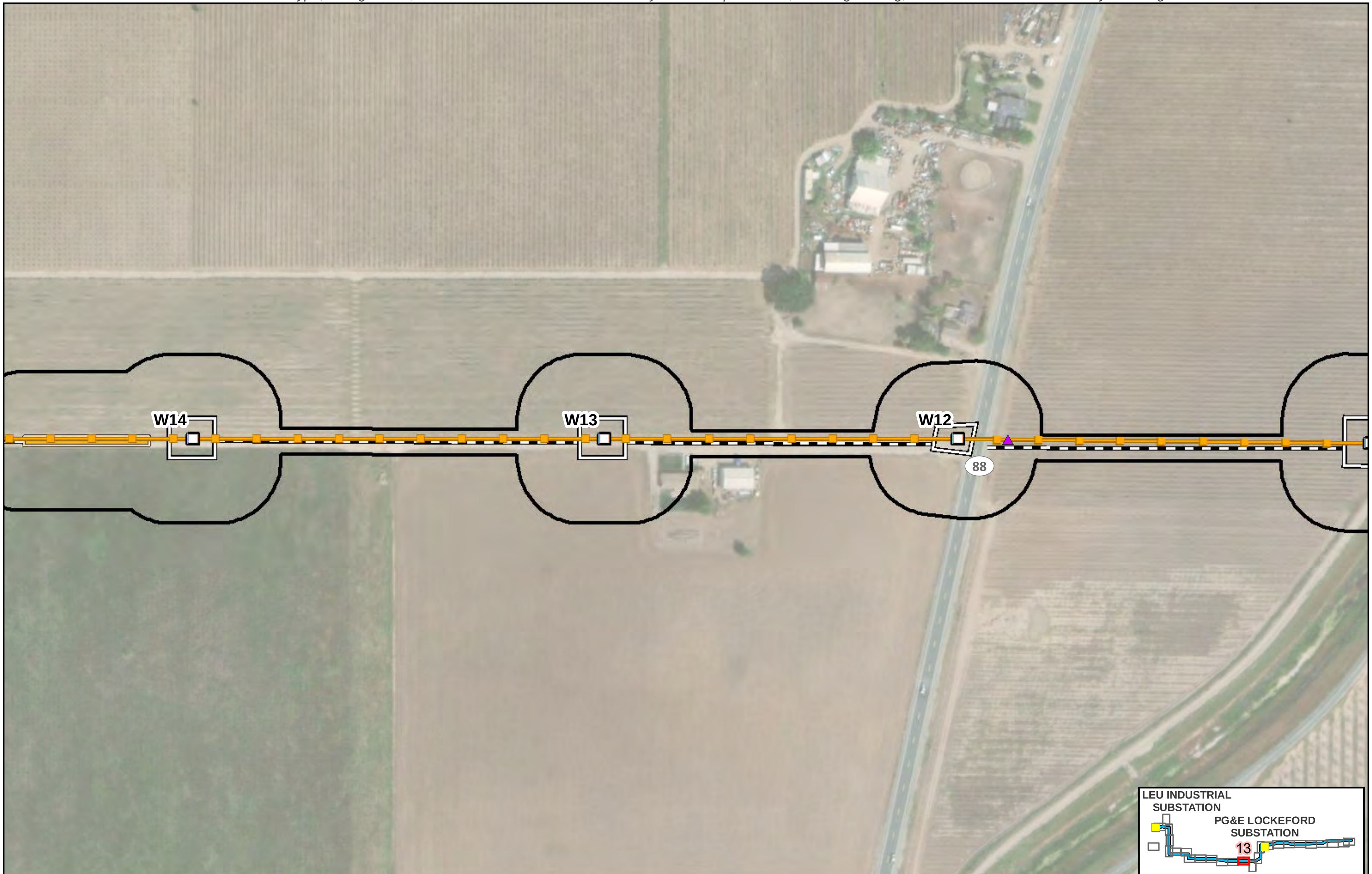

Legend

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 13 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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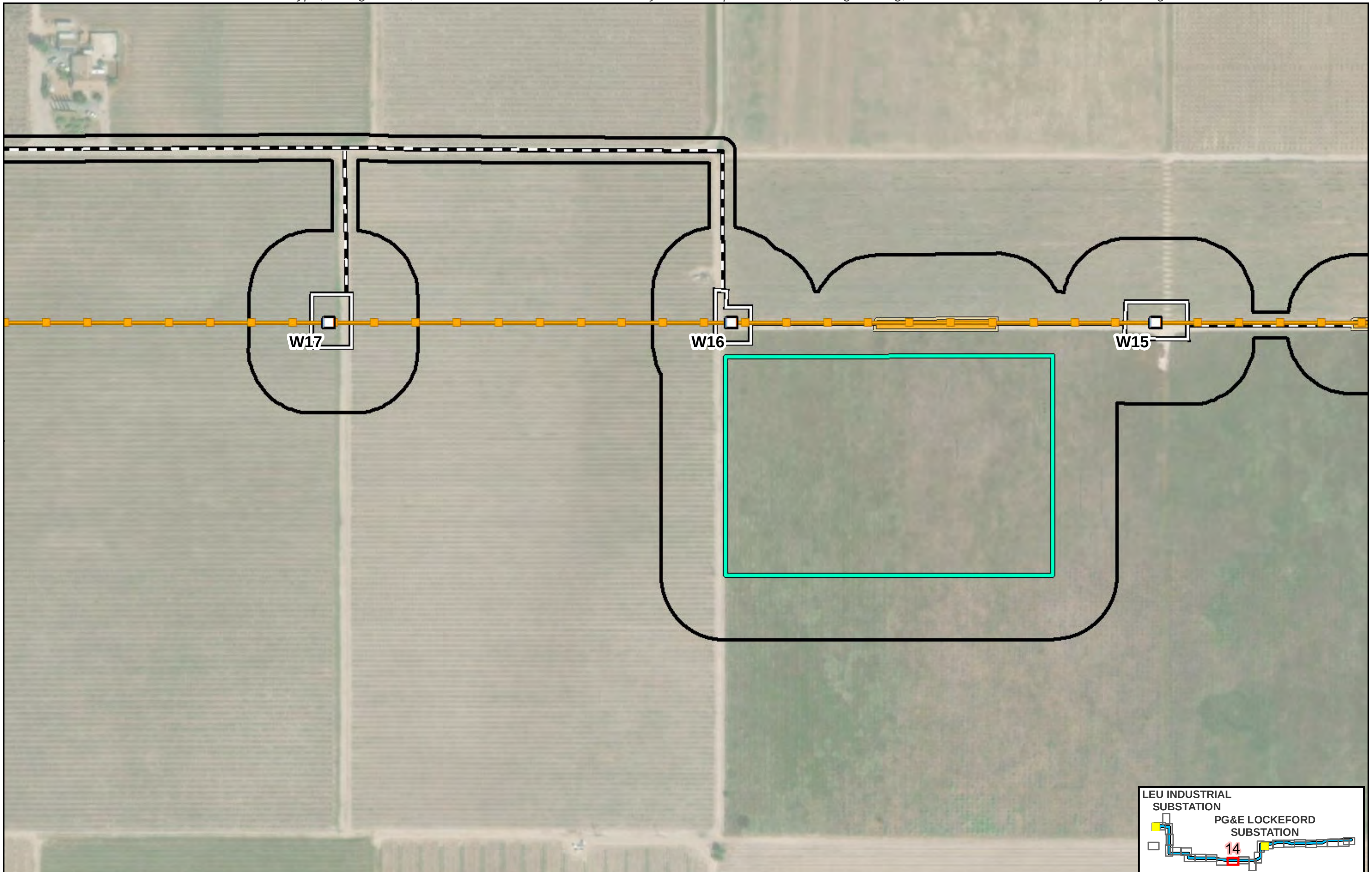

Legend

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 14 of 26
Northern San Joaquin 230 kV Transmission Project

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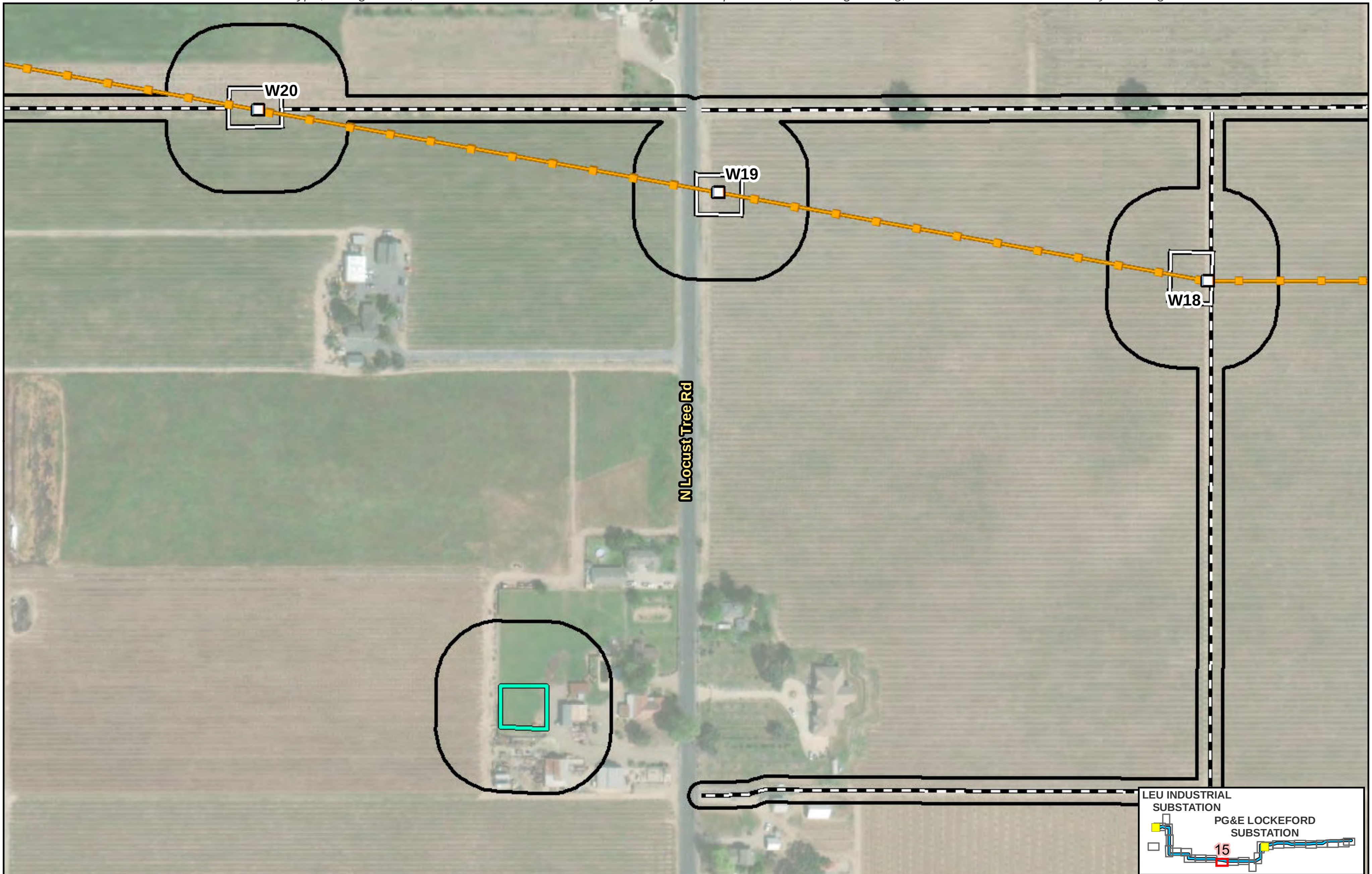

Legend

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Source:
1) Esri World Imagery

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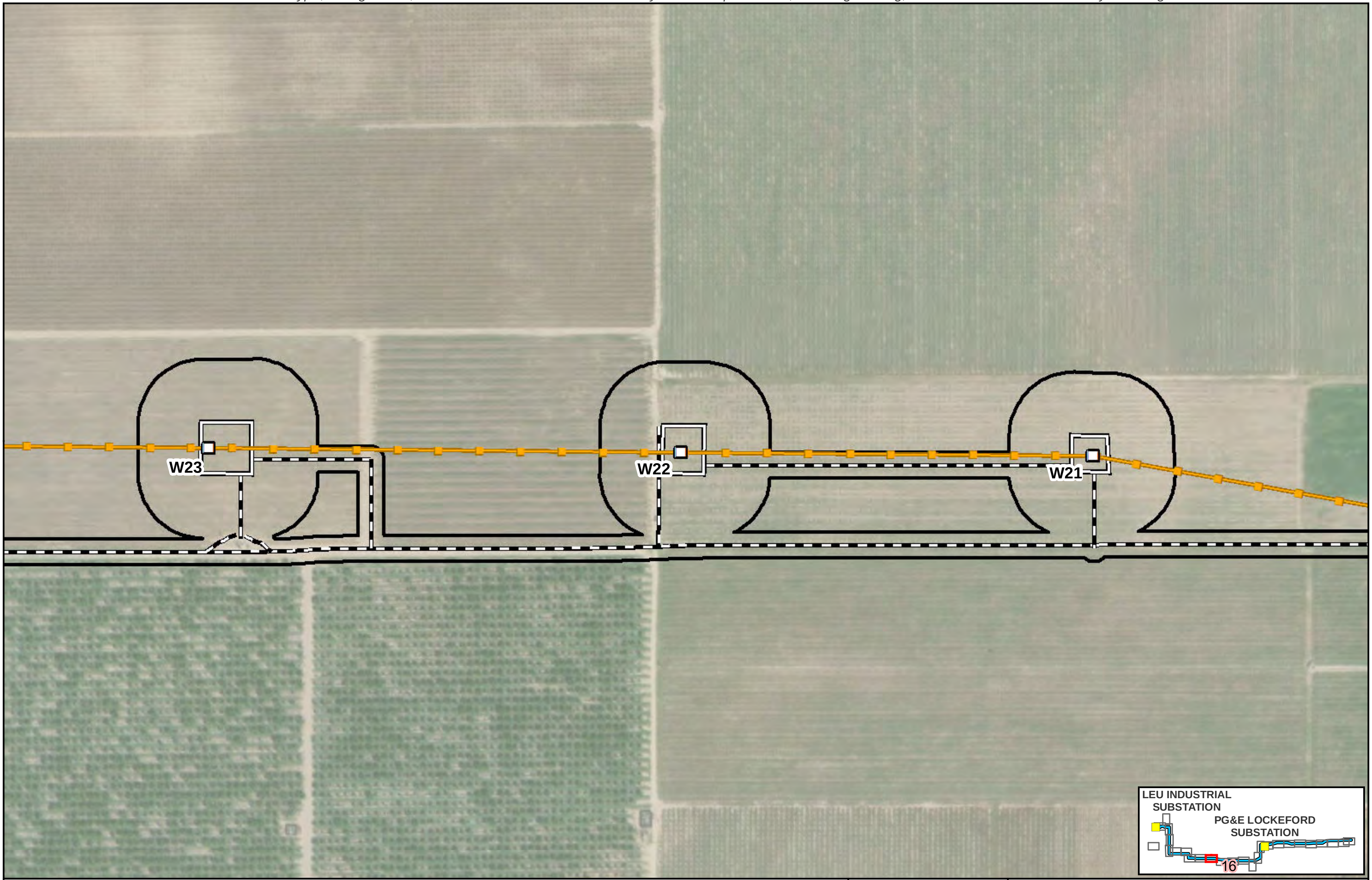
Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 15 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 16 of 26
Northern San Joaquin 230 kV Transmission Project

Preliminary design and engineering for the physical, civil, and outdoor components.
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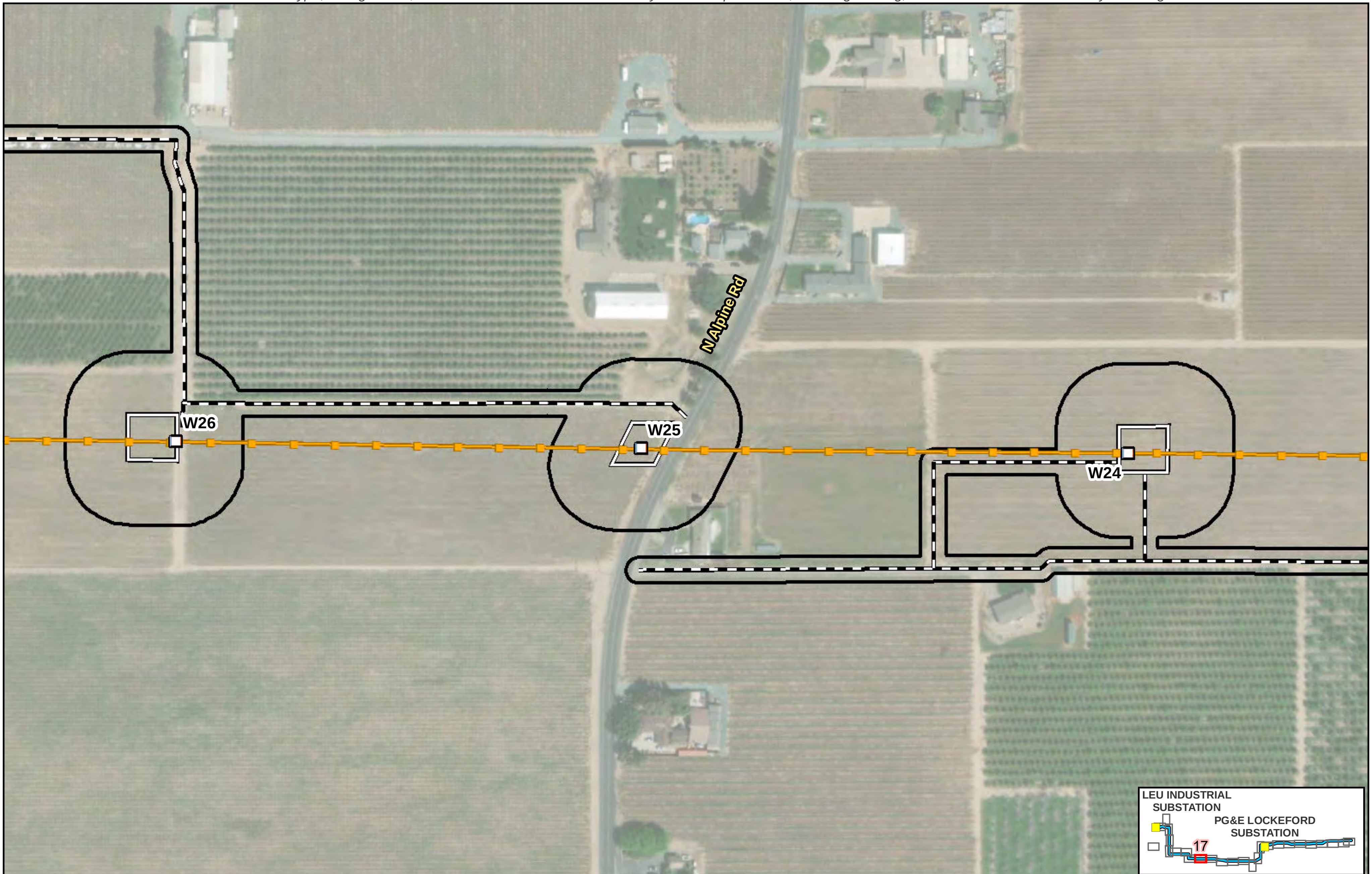

Legend

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- Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 17 of 26
Northern San Joaquin 230 kV Transmission Project

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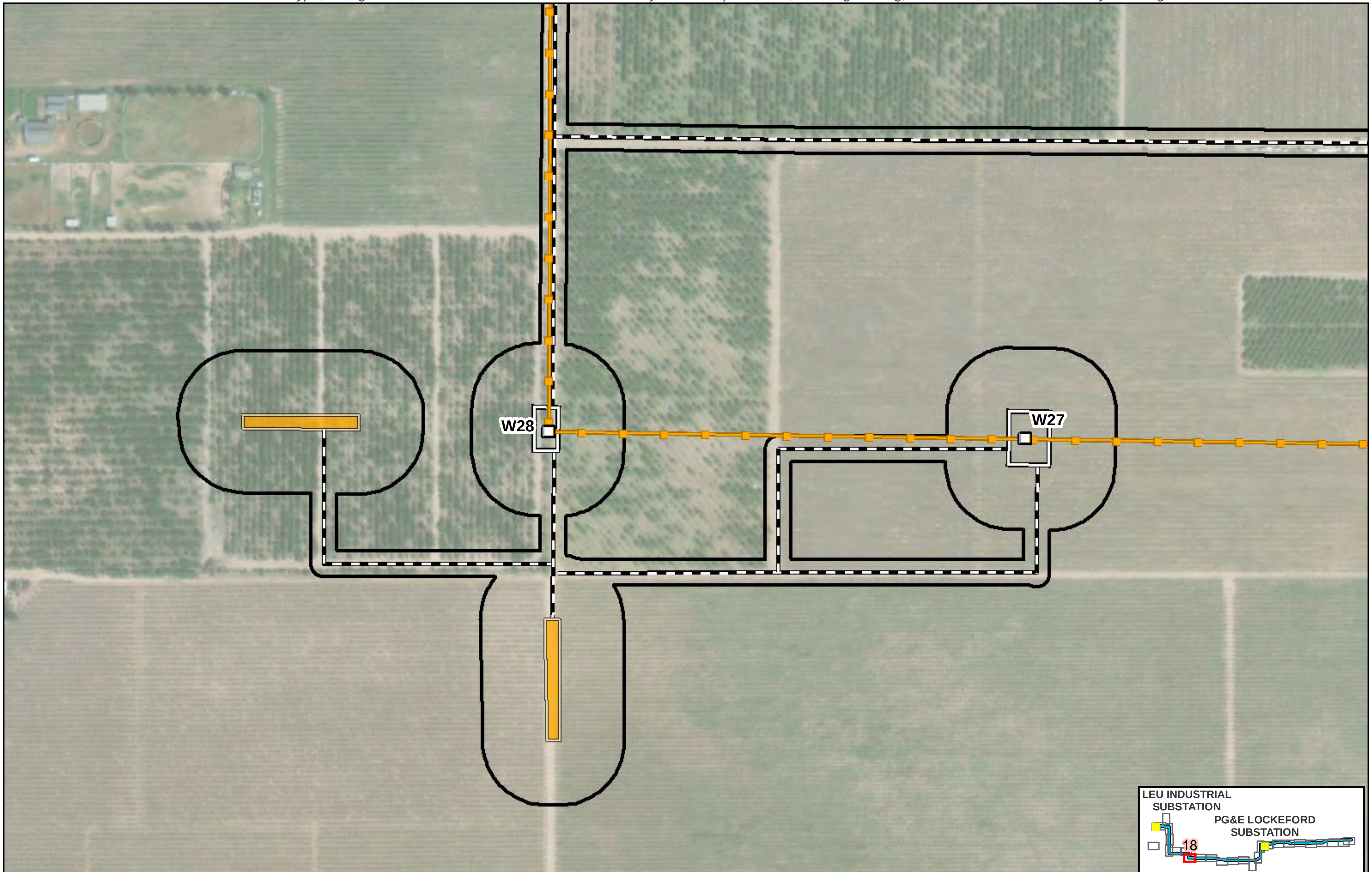

Legend

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Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 18 of 26
Northern San Joaquin 230 kV Transmission Project

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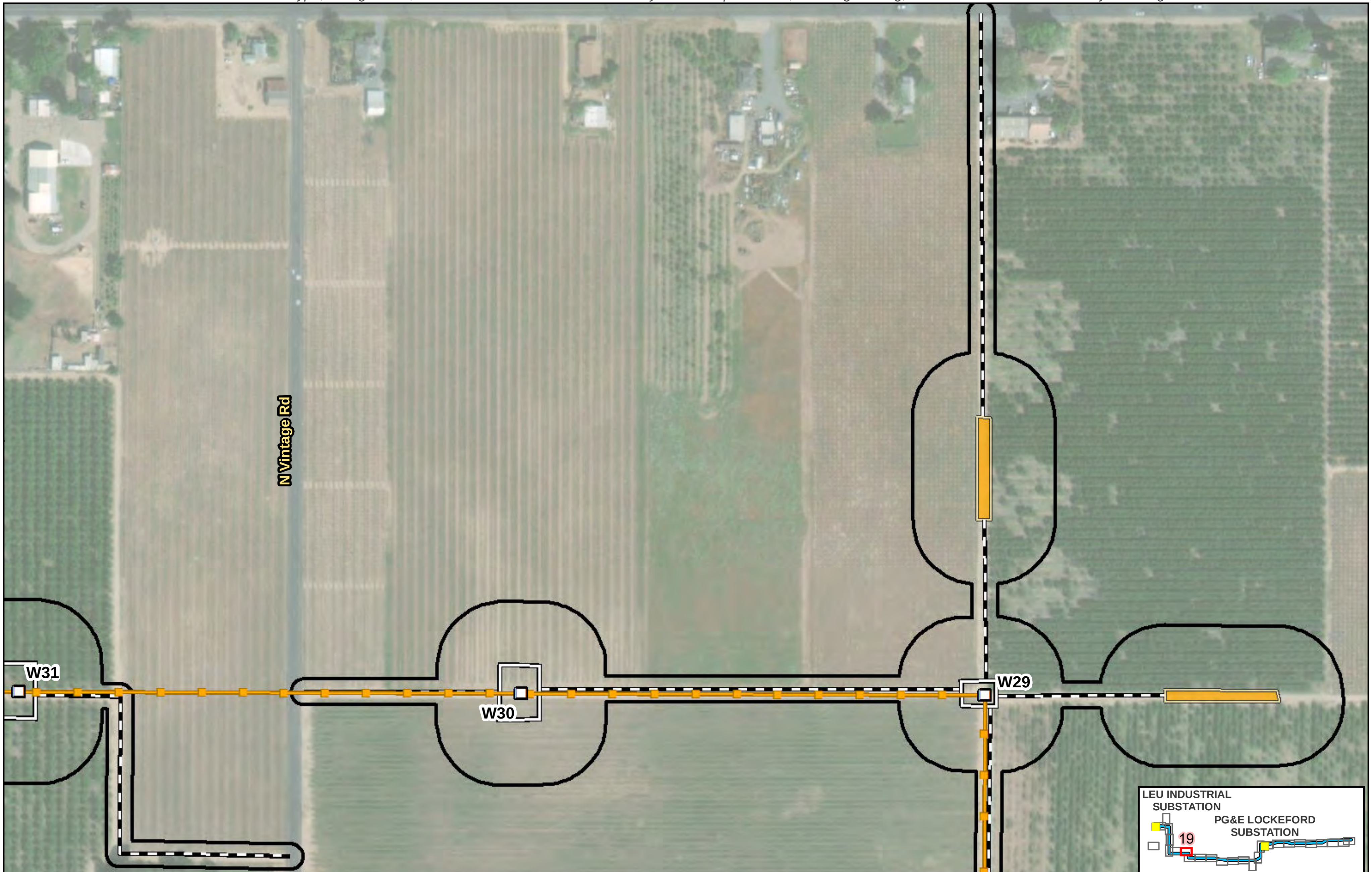

Legend

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- Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 19 of 26
Northern San Joaquin 230 kV Transmission Project

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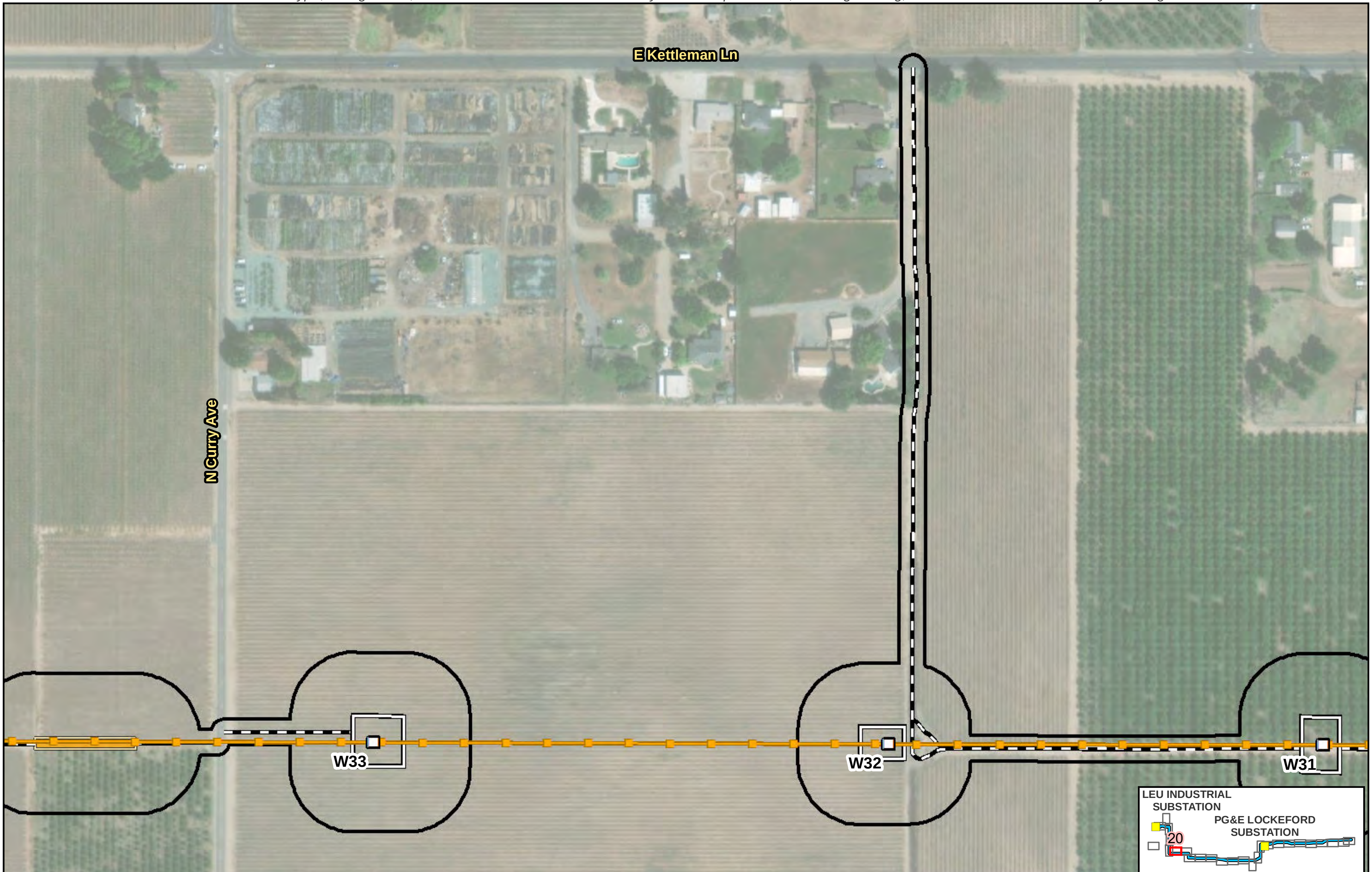

Legend

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- Proposed Pull Site
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- Proposed Staging Area

Source:
1) Esri World Imagery

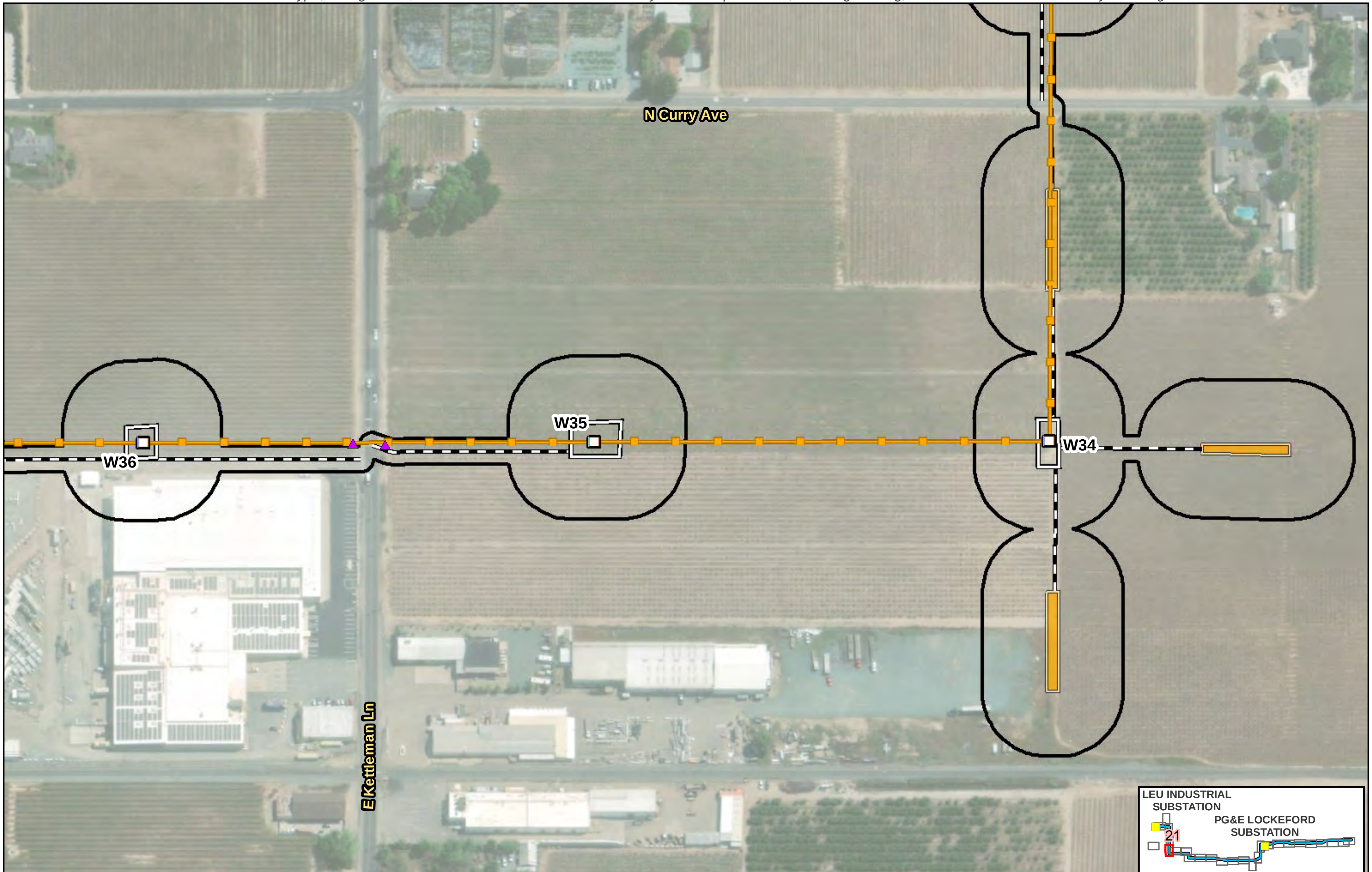
N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 20 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023



Legend

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- Proposed Work Area
- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 21 of 26
Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

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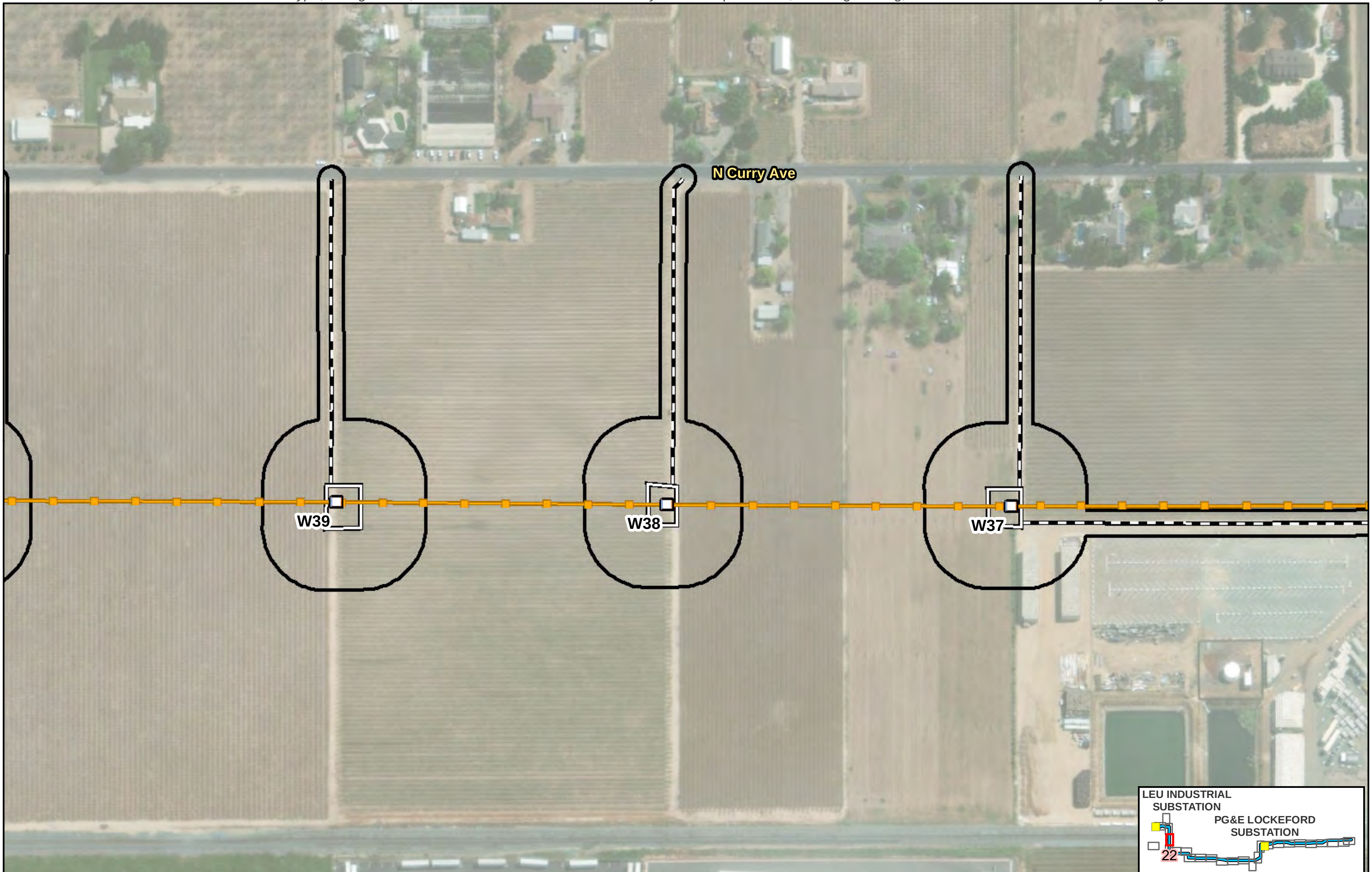

Legend

- Biological Resources Survey Area (387.06 acres)
- Substation
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Proposed Impact Areas

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- Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 22 of 26
Northern San Joaquin 230 kV Transmission Project

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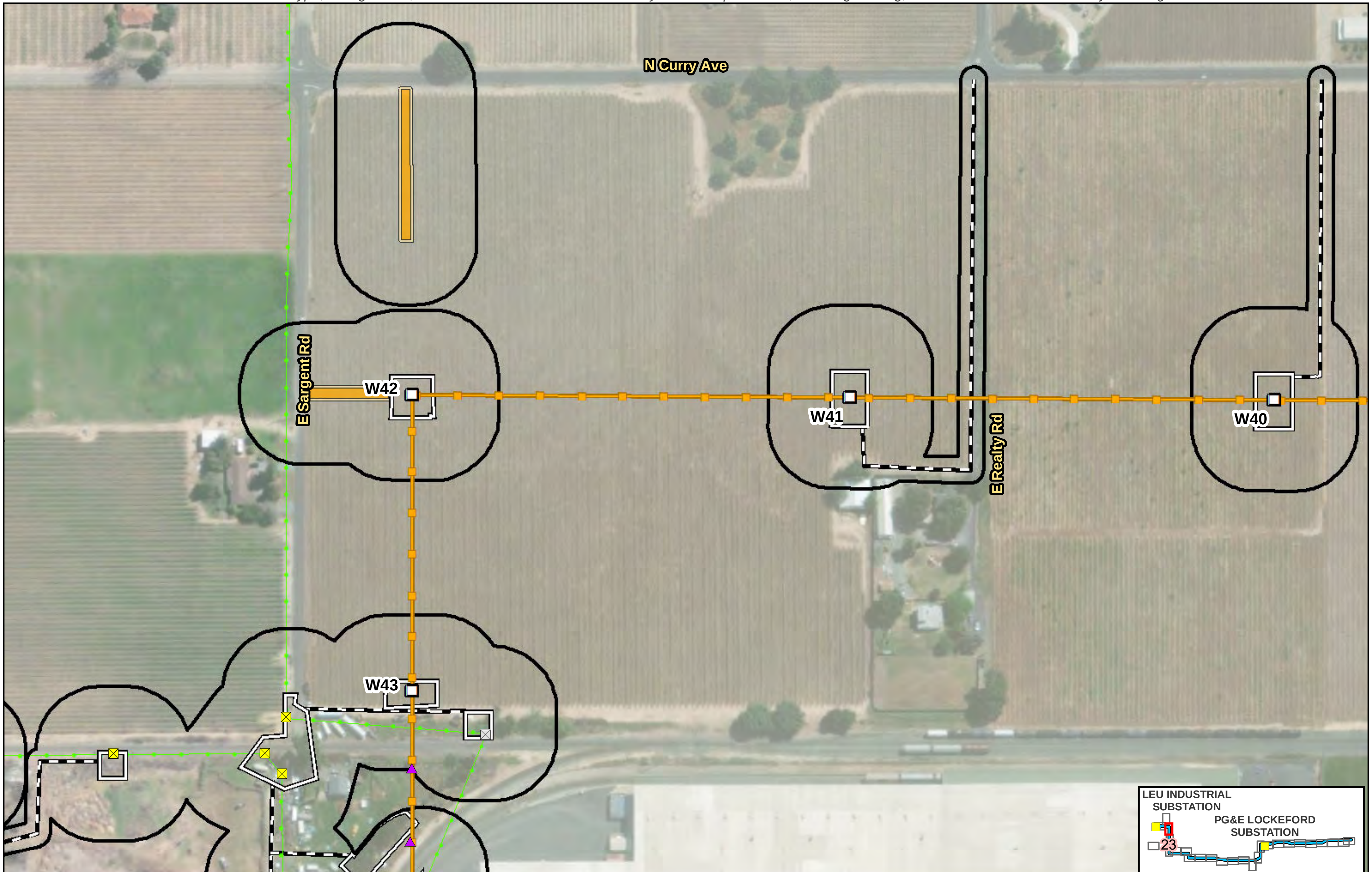

Legend
- Biological Resources Survey Area (387.06 acres)
- Substation
- PG&E New 230 kV Transmission Line
- Existing 60 kV Power Line
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Proposed Impact Areas
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- Proposed Staging Area

Source:
1) Esri World Imagery

N

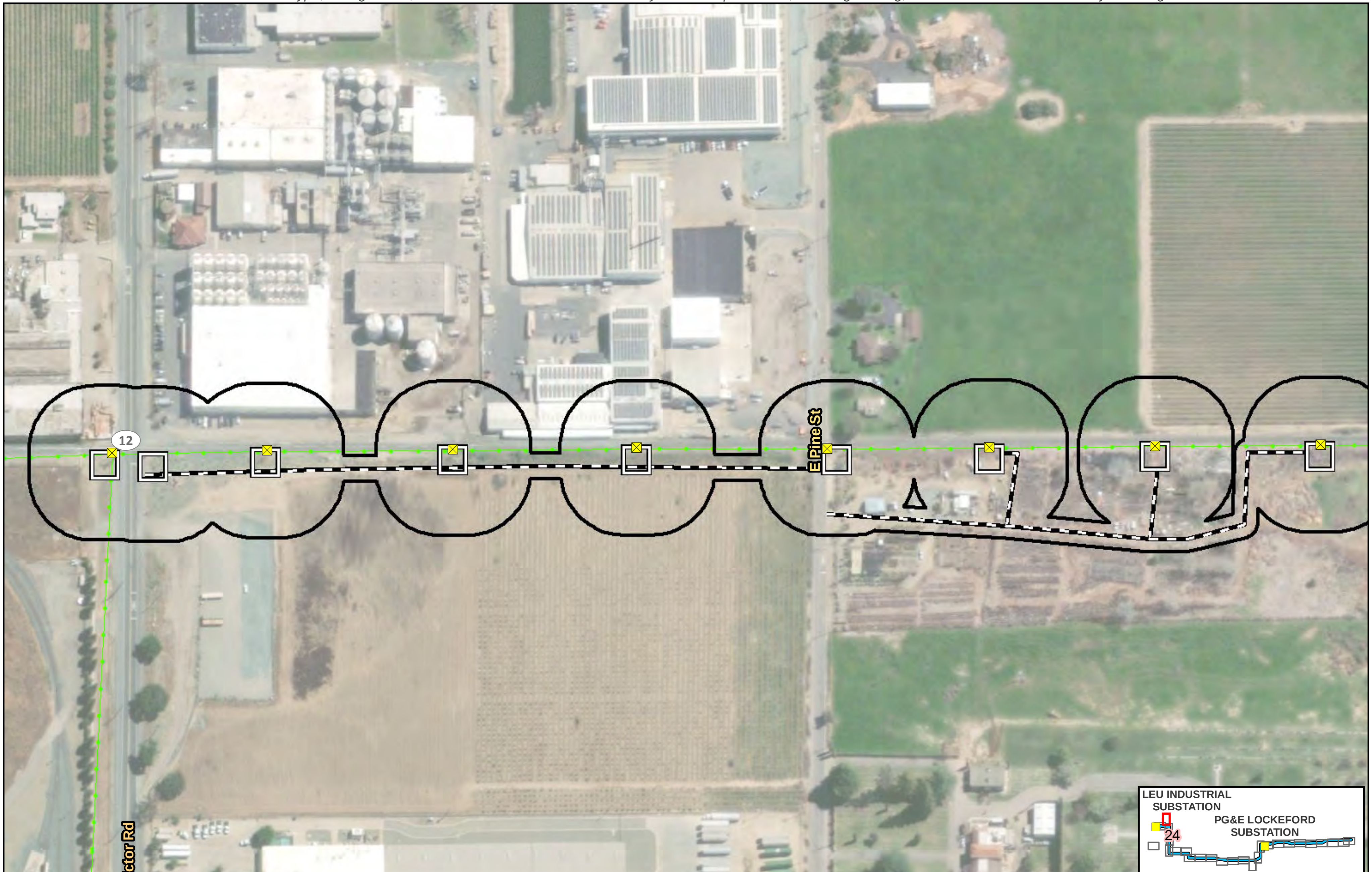
Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area

Northern San Joaquin 230 kV Transmission Project

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023



Legend

Biological Resources Survey Area (387.06 acres)
Substation
PG&E New 230 kV Transmission Line
Existing 60 kV Power Line
Existing 230 kV Transmission Line

Proposed Impact Areas

Proposed Structure
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Existing Guy Stub Pole: Remove
Potential Guard Structure Area
Proposed Access Route
Proposed Work Area
Proposed Pull Site
Proposed Fenceline
Proposed Staging Area

Source:
1) Esri World Imagery

N

Scale: 1:3,000
0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 24 of 26
Northern San Joaquin 230 kV Transmission Project

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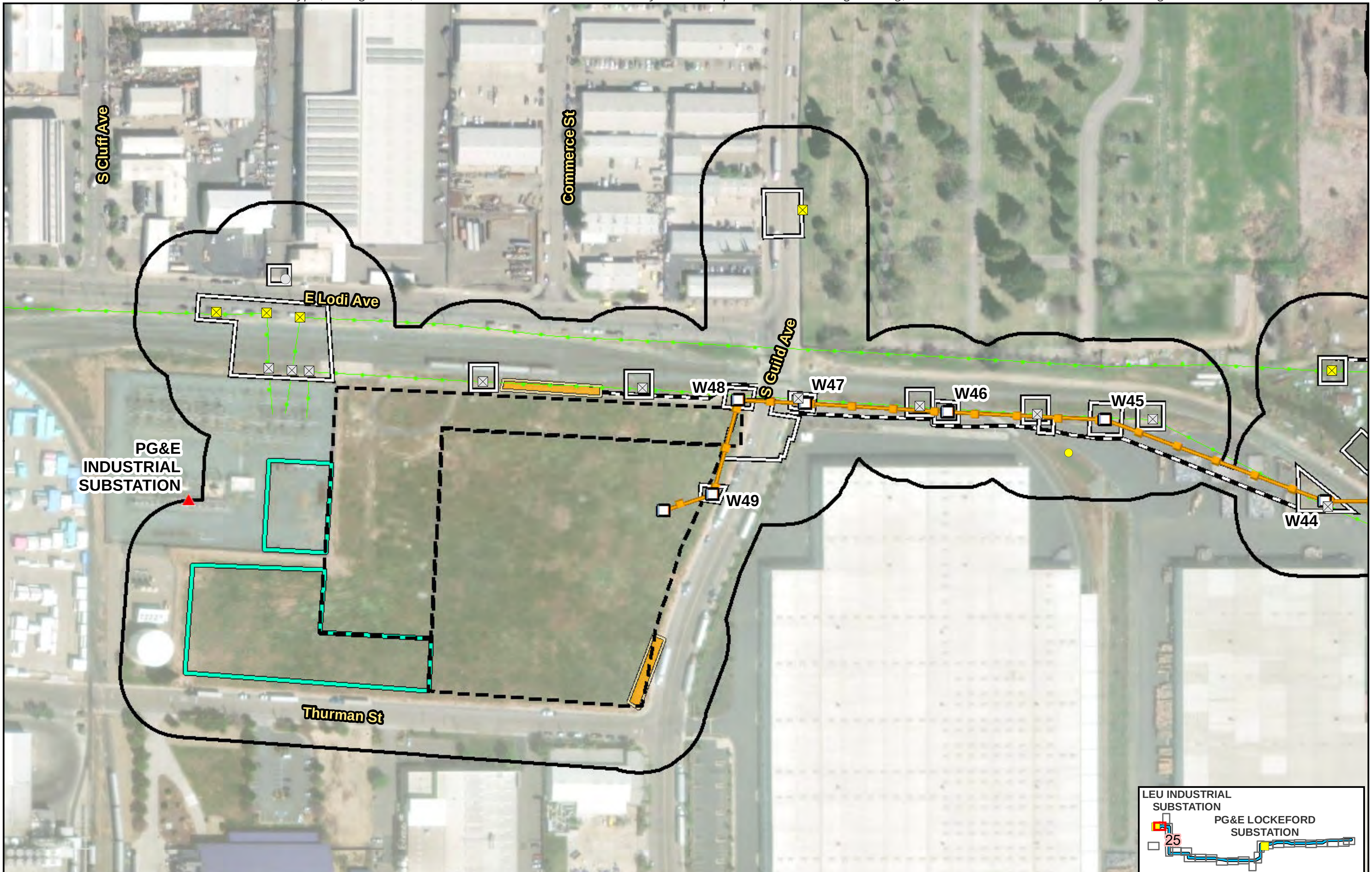

Legend

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- Proposed Pull Site
- Proposed Fenceline
- Proposed Staging Area
- Culvert

Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 25 of 26
Northern San Joaquin 230 kV Transmission Project

PG&E

\\dc1vs01\gisproj\P\PGE\NSJPC\MapFiles\PEA\BiologicalResources\Tech_Report\Figure_4_230818.mxd kgrant1 8/21/2023

Legend

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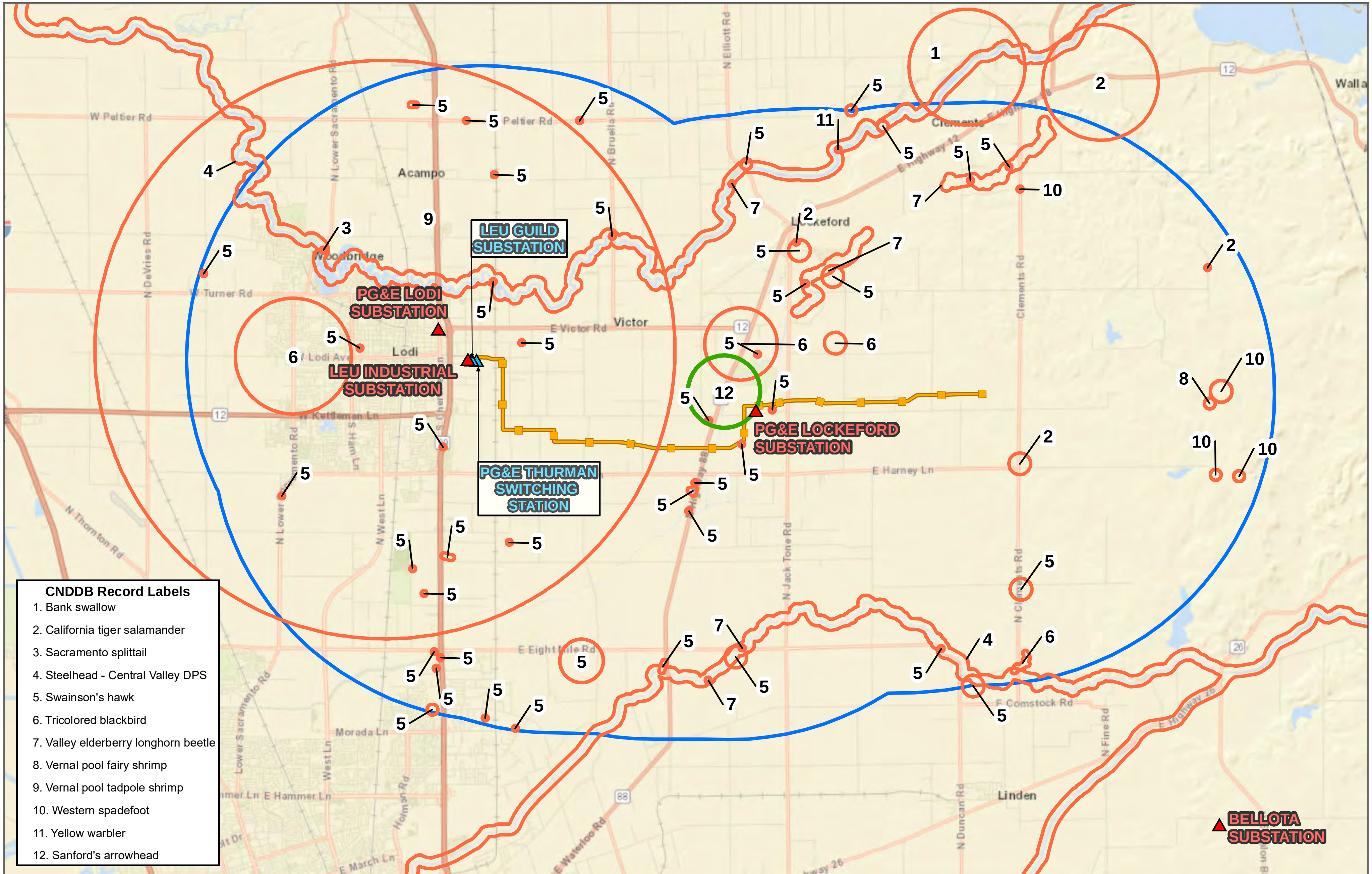
Source:
1) Esri World Imagery

N

Scale: 1:3,000

0 100 Feet

FIGURE 4
Aquatic Resources within the Biological Resources Survey Area
Page 26 of 26
Northern San Joaquin 230 kV Transmission Project



Legend

- Exsting Substation
- New Substation/ Switching Station
- PG&E New 230 kV Transmission Line
- 5-mile Project Buffer
- CNDDB Records within 5 Miles of the Project Area - Wildlife
- CNDDB Records within 5 Miles of the Project Area - Plants

Source:
1) ESRI World Street Map
2) CDFW, California Natural Diversity Database, December 2020.

N

0 9,400 18,800 Feet

Scale: 1:140,000

Project Location

FIGURE 5

CNDDB Records within 5 Miles of the Project Area

Northern San Joaquin 230 kV Transmission Project

Jacobs

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Attachment A
Special-Status Species Tables

Attachment A: Special-Status Species Tables

The special-status species tables have been divided into plants (Table A-1) and wildlife (Table A-2).

Table A-1: Special-Status Plant Species Identified in the Records Searches

Scientific Name	Common Name	Status*			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Agrostis hendersonii	Henderson's bent grass	-	-	3.2	Valley and foothill grassland (mesic) and vernal pools	Apr-Jun	Unlikely to occur. Low-quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Arctostaphylos myrtifolia	Ione manzanita	T	-	1B.2	Chaparral and cismontane woodland	Nov-Mar	Absent. No suitable habitat is present within the BSA.
Astragalus tener var. *tener*	alkali milk vetch	-	-	1B.2	Alkali playa, valley and foothill grassland, vernal pools; low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools	Mar-Jun	Unlikely to occur. Low-quality, disturbed, and ruderal grassland exists throughout the BSA, as do alkali flats. There is one historic occurrence in Stockton, but the BSA does not have alkaline habitat or vernal pools for this species to grow (Calflora 2022).
Atriplex cordulata var. *cordulata*	heartscale	-	-	1B.2	Saline soils, alkaline scrub, chenopod scrub, meadows and seeps, valley and foothill grassland	Apr-Oct	Unlikely to occur. Scrubs are not present in the BSA, and although there are historic occurrences in the Stockton West quadrangle (Calflora 2022), suitable habitat has predominantly been converted to agricultural development. Additionally, saline soils suitable for this species are not present in the BSA.
Azolla microphylla	Mexican mosquito fern	-	-	4.2	Marshes and swamps (ponds, slow water)	Aug	Absent. Marshes and swamps are not present in the BSA.

Scientific Name	Common Name	Status*			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Blepharizonia plumosa	big tarplant	-	-	1B.1	Dry hills and plains in annual grassland; clay to clay-loam soils; usually on slopes and often in burned areas	Jul-Oct	Unlikely to occur. Calflora search results indicate a confirmed range within the BSA and one occurrence in the Stockton West quadrangle (Calflora 2022). However, suitable habitat such as slopes and burned areas are not present. Additionally, increasing agricultural development and urbanization has severely limited suitable habitat of this species.
Brasenia schreberi	watershield	-	-	2B.3	Marshes and swamps (freshwater); this plant is strictly aquatic	Jun-Sep	Absent. Marshes and swamps are not present in the BSA.
Brodiaea rosea	valley brodiaea	-	-	4.2	Old alluvial terraces; silty, sandy, and gravelly loam; valley and foothill grassland (swales) and vernal pools	Apr-May (Jun)	Unlikely to occur. Calflora search results indicate a confirmed range within the project area and an occurrence in the Clements quadrangle (Calflora 2022); however, suitable habitat has predominantly been converted to vineyards and orchards, which do not support habitat requirements of this species.
Calycadenia hooveri	Hoover's calycadenia	-	-	1B.3	Cismontane woodland and valley and foothill grassland	Jul-Sep	Unlikely to occur. Low-quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Carex comosa	bristly sedge	-	-	2B.1	Coastal prairie, marshes and swamps (lake margins), and valley and foothill grassland	May-Sep	Unlikely to occur. Low-quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Scientific Name	Common Name	Status* Federal	Status* State	Status* CNPS	Habitat	Blooming Period	Potential for Occurrence within the BSA
Castilleja campestris var. *succulenta*	succulent owl's-clover	T	E	1B.2	Occurs usually in wetlands, occasionally in non-wetlands; habitat is vernal pools (often acidic) with a variety of characteristics, including small and large pools, bowl-shaped pools and swales, shallow and deep pools, and pools with short and long inundation periods; vegetation communities include valley grassland, foothill grassland, freshwater wetlands, wetland-riparian	(Mar) Apr-May	Potential to occur. Although there are no CNDDB occurrences within 5 miles of the BSA, a reconnaissance survey conducted in early December of 2019 and an aquatic resources delineation conducted in April and May of 2021 indicated the presence of wetland features in portions of the BSA that could provide suitable habitat for this species. This species was not found during the appropriately timed botanical surveys.
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	-	-	4.2	Occurs in alkaline and vernally mesic soils in seeps, valley and foothill grassland, vernal pools, and sometimes roadsides	May-Oct	Unlikely to occur. The BSA does not have alkaline habitats for this species to grow and there are no CNDDB occurrences within 5 miles of the BSA.
Chloropyron palmatum	palmate-bracted bird's-beak	E	E	1B.1	Occurs in alkaline soils, grows in saline-alkaline soils in seasonally flooded lowland plains and basins at elevations of less than 500 feet; associated plant species include iodine bush (*Allenrolfea occidentalis*), alkali heath (*Frankenia salina*), Great Valley gum plant (*Grindelia camporum*), and Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*); vegetation communities include chenopod scrub, valley grassland, foothill grassland	May-Oct	Absent. No suitable habitat is present within the BSA.
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	-	-	2B.1	Marshes and swamps (brackish, coastal, freshwater)	Jul-Sep	Absent. No marshes or swamps are present within the BSA.
Delphinium recurvatum	recurved larkspur	-	-	1B.2	Chenopod scrub, valley and foothill grassland, cismontane woodland; on alkaline soils; often in valley saltbrush or valley chenopod scrub	Mar-Jun	Absent. Calflora search results indicate a possible range within the BSA and an occurrence in the Stockton East quadrangle (Calflora 2022). However, no suitable habitat or a confirmed range overlap is present.

Scientific Name	Common Name	Status*			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Downingia pusilla	dwarf downingia	-	-	2B.2	Occurs in wetlands; habitat is vernal pools (no acidic preference) and wet ditches; vegetation communities include foothill woodland, valley grassland, freshwater wetlands, wetland-riparian	Mar-May	Unlikely to occur. Calflora search results indicate a possible range within the project area, an occurrence in the Stockton East quadrangle, and the possible occurrence of suitable habitat. However, there are no CNDDB occurrences within 5 miles of the BSA. Vernal pool habitat is not present.
Eryngium pinnatisectum	Tuolumne button-celery	-	-	1B.2	Cismontane woodland, lower montane coniferous forest, and vernal pools	May-Aug	Absent. No suitable habitat is present within the BSA.
Eryngium racemosum	Delta button-celery	-	E	1B.1	Riparian scrub; seasonally inundated floodplains on clay	Jun-Oct	Absent. Riparian scrub and floodplains do not exist in the BSA.
Extriplex joaquinana	San Joaquin spearscale	-	-	1B.2	Alkaline soils, chenopod scrub, meadows and seeps, playas, valley and foothill grassland	Apr-Oct	Unlikely to occur. There is only marginally suitable habitat present in the BSA. Alkaline habitat is not present. There are no CNDDB occurrences within 5 miles of the BSA.
Gratiola heterosepala	Boggs Lake hedge-hyssop	-	E	1B.2	Found predominantly growing in clay soils, marshes and swamps (lake margins), vernal pools	Apr-Aug	Absent. Marshes and swamps do not occur in the BSA. Additionally, the closest extant populations of this species occur in Solano and Sacramento counties (Calflora 2022).
Hesperevax caulescens	hogwallow starfish	-	-	4.2	Valley and foothill grassland (mesic clay) and vernal pools (shallow)	Mar-Jun	Unlikely to occur. Low-quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Hibiscus lasiocarpos var. *occidentalis*	wooly rose-mallow	-	-	1B.2	Marshes and swamps (freshwater); moist, freshwater-soaked river banks and low peat islands in sloughs; can also occur on riprap and levees	Jun-Sep	Absent. Marshes and swamps are not present in the BSA.
Horkelia parryi	Parry's horkelia	-	-	1B.2	Chaparral and cismontane woodland	Apr-Sep	Absent. No suitable habitat is present within the BSA.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status* Federal	State	CNPS	Habitat	Blooming Period	Potential for Occurrence within the BSA
Juncus leiospermus var. *ahartii*	Ahart's dwarf rush	-	-	1B.2	Valley and foothill grassland (mesic)	Mar-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Lasthenia ferrisiae	Ferris' goldfields	-	-	4.2	Vernal pools (alkaline, clay)	Feb-May	Absent. No suitable habitat is present within the BSA.
Lathyrus jepsonii var. *jepsonii*	delta tule pea	-	-	1B.2	Found in freshwater and brackish marshes; most often in ditches and along levees near Napa; often found with *Typha*, *Aster lentus*, *Rosa californica*, *Juncus* spp., *Scripus* spp.; usually on marsh and slough edges	May-Jul	Absent. The closest recorded observations of this species occur in western Lodi and Stockton (Calflora 2022); however, suitable habitat such as marshland sloughs are not present in the BSA.
Legenere limosa	legenere	-	-	1B.1	Occurs below elevations of 2,000 feet in vernal pools and wetlands; vegetation communities include valley grassland, freshwater wetlands, wetland-riparian	Apr-Jun	Unlikely to occur. There is marginally suitable wetland habitat present in the BSA. There are no CNDDDB occurrences within 5 miles of the BSA.
Lilaeopsis masonii	Mason's lilaeopsis	-	R	1B.1	Found in freshwater and brackish marshes and in riparian scrub habitats; found along the margins of the Napa River	Apr-Nov	Absent. This species grows predominantly along the margins of the Napa River (Calflora 2022). Suitable habitat is not present.
Limosella australis	Delta mudwort	-	-	2B.1	Marshes and swamps (brackish, freshwater) and riparian scrub	May-Aug	Absent. No suitable habitat is present within the BSA.
Navarretia myersii ssp. *myersii*	pincushion navarretia	-	-	1B.1	Vernal pools; clay soils within non-native grassland	Apr-May	Absent. This species predominantly occurs in the foothill grasslands of the Sierra Nevada (Calflora 2022). Suitable habitat is not present.
Navarretia paradoxiclara	Patterson's navarretia	-	-	1B.3	Meadows and seeps	May-Jun (Jul)	Absent. No suitable habitat is present within the BSA.
Orcuttia viscida	Sacramento Orcutt grass	E	E	1B.2	Occurs in wetlands; habitat is vernal pools (often acidic); vegetation communities include valley grassland, freshwater wetlands, wetland-riparian	Apr-Jul (Sep)	Absent. The closest extant populations occur in Placer, Sacramento, and El Dorado Counties outside of the BSA (Calflora 2022). Suitable habitat is not present.

Scientific Name	Common Name	Status*			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Ranunculus lobbii	Lobb's aquatic buttercup	-	-	4.2	Cismontane woodland, north Coast coniferous forest, valley and foothill grassland, and vernal pools	Feb-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Sagittaria sanfordii	Sanford's arrowhead	-	-	1B.2	Occurs in wetlands, marshes, and swamps (assorted shallow freshwater); vegetation communities include freshwater wetlands, wetland-riparian	May-Oct (Nov)	Potential to occur. Marginally suitable habitat is present in the BSA adjacent to aquatic resources such as creeks, canals, and ditches. There is one CNDDB occurrence within 5 miles of the BSA. The species was not observed during appropriately timed botanical surveys.
Scutellaria galericulata	marsh skullcap	-	-	2B.2	Lower montane coniferous forest, meadows and seeps (mesic), and marshes and swamps	Jun-Sep	Absent. No suitable habitat is present within the BSA.
Scutellaria lateriflora	side-flowering skullcap	-	-	2B.2	Meadows and seeps (mesic) and marshes and swamps	Jul-Sep	Absent. No suitable habitat is present within the BSA.
Symphyotrichum lentum	Suisun marsh aster	-	-	1B.2	Found in brackish and freshwater marshes and swamps; most often seen along sloughs with *Phragmites, Scripus, Rubus, Typha*	May-Nov	Unlikely to occur. Calflora search results indicate occurrences in the Stockton West, Stockton East, and Lodi South quadrangles (Calflora 2022). However, marshes and swamps are not present in the BSA.
Trifolium hydrophilum	saline clover	-	-	1B.2	Occurs in marshes and swamps, vernal pools and valley and foothill grassland; mesic, alkaline sites	Apr-Jun	Absent. Most recent observations of this species are within the Suisun and San Pablo bays (Calflora 2022). Suitable alkaline habitat is not considered present in the BSA.
Tuctoria greenei	Greene's Tuctoria	E	R	1B.1	Vernal pools	May-Jul(Sep)	Absent. This species has recorded occurrences in Stockton and Farmington in 1936 (Calflora 2022). However, this species is considered extirpated from the BSA because of increased agricultural development and urbanization. Suitable habitat is not present.

Scientific Name	Common Name	Status*			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			

*Status designations are as follows:

Federal Designations:

(E) Federally Endangered; (T) Federally Threatened

State Designations:

(E) State Endangered; (R) Rare

California Native Plant Society (CNPS) California Rare Plant Rank (CRPR):

(1A) Presumed extinct in California

(1B) Rare, threatened, or endangered in California and elsewhere

(2B) Rare, threatened, or endangered in California, but more common elsewhere

(3) More information is needed

(4) Limited distribution

Threat Rank:

0.1 Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)

0.2 Moderately threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)

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

Sources:

California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database, Biogeographic Data Branch. California Department of Fish and Wildlife. Sacramento, CA. Accessed May 3, 2023. https://www.wildlife.ca.gov/data/cnddb.

California Native Plant Society (CNPS). 2023. Online Inventory of Rare, Threatened and Endangered Plants of California. Accessed May 3, 2023. http://www.rareplants.cnps.org/advanced.html.

California Native Plant Society Calflora Database (Calflora). 2022. "'What Grows Here' online application for documented ranges and occurrences of rare and endangered plants of California." Accessed August 29, 2022. https://www.calflora.org/.

U.S. Fish and Wildlife Service (USFWS). 2023. Environmental Conservation Online System: Information, Planning and Conservation System (IPaC), 2023. Accessed May 3, 2023. https://ecos.fws.gov/ipac/.

Table A-2: Special-status Wildlife Species Identified in the Records Searches

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Invertebrates						
Bombus crotchii	Crotch bumble bee	-	CE	-	Range extends from coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	Unlikely to occur. Habitat for this species, including annual grassland, small mammal burrows, and floral host plants, occurs within the BSA. However, the species is thought to be absent from much of its historic range in the Central Valley (Hatfield et. al. 2014). Additionally, current land use in the BSA has degraded potential habitat to very low quality.
Branchinecta conservatio	Conservancy fairy Shrimp	E	-	-	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains in rain-filled vernal pools and swales.	Unlikely to occur. Suitable vernal pool habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA, and per the most recent 5-year review of the species, the closest known population is greater than 20 miles away (USFWS 2012). Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard and are no longer considered suitable habitat.

Scientific Name	Common Name	Status* Federal	State	CDFW	Habitat	Potential for Occurrence in BSA
Branchinecta lynchi	vernal pool fairy shrimp	T	-	-	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains in rain-filled vernal pools and swales.	Unlikely to occur. Suitable vernal pool and swale habitat is not present within the BSA. There is one CNDDB occurrence (#925) within 5 miles of the BSA. This occurrence is located within known vernal pools 4 miles east of the BSA and is separated from the BSA by at least 1.8 miles of crop agriculture. This species has been known to occur in roadside ditches and similar areas, but this is often in proximity to higher quality vernal pool habitat. In addition, no roadside ditches or swales will be affected by project activities. Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard and are no longer considered suitable habitat.
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	T	-	-	Valley elderberry longhorn beetles are found in riparian habitat only in the vicinity of their host plant, the elderberry (*Sambucus* species).	Potential to occur. Host plant, the elderberry (*Sambucus* species, such as *S. nigra*), does exist in the BSA. There are five CNDDB occurrences within 5 miles of the BSA.
Lepidurus packardi	vernal pool tadpole shrimp	E	-	-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools. Commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Unlikely to occur. Suitable vernal pool and swale habitat is not present within the BSA. There is one CNDDB occurrence (#210) within 5 miles of the BSA. This occurrence has no location or ecological setting details and is based on one specimen collected in 1990. Aerial imagery indicates that aside from the Mokelumne River, the occurrence area has been nearly entirely converted to crop agriculture, which is not suitable habitat for this species. Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard and are no longer considered suitable habitat.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Fish						
Acipenser medirostris	Green sturgeon – southern distinct population segment (DPS)	T	-	-	Spawns in the Sacramento, Feather, and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. The San Francisco Estuary is important for rearing juveniles.	Absent. Suitable habitat is not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Hypomesus transpacificus	delta smelt	T	E	-	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities <2 ppt.	Absent. Suitable habitat is not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Oncorhynchus mykiss irideus	steelhead - Central Valley DPS	T	-	-	The minimum depth of water required for successful migration of adult steelhead is 7 inches, although the distance fish must travel through shallow water areas is also a critical factor. Spawning ranges from 6 to 24 inches with an average of 14 inches. Substrates from 0.2 to 4.0 inches in diameter. Temperature requirement of 39 to 52°F.	Unlikely to occur. There is only marginally suitable habitat in the BSA within Bear Creek and Paddy Creek. There are two CNDDB occurrences within 5 miles of the BSA within large rivers including Mokelumne River and Lower Calaveras River.
Pogonichthys macrolepidotus	Sacramento splittail	-	-	SSC	Estuarine habitat. Requires a rising hydrograph for upstream migration and flooded vegetation for spawning and rearing areas.	Unlikely to occur. There is only marginally suitable habitat in the BSA within Bear Creek and Paddy Creek. There is one CNDDB occurrence within 5 miles of the BSA in the lower Mokelumne River.
Spirinchus thaleichthys	longfin smelt	C	T	-	Euryhaline, nektonic, and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	Absent. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Amphibians						
Ambystoma californiense	California tiger salamander	T	T	WL	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma Counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	Unlikely to occur. There are four CNDDB occurrences within 5 miles of the BSA; however, these have been within known vernal pool habitat. Vernal pools are not present within the BSA. Two CNDDB occurrences are historic (#280 from 1973, #289 from 1925). Aerial imagery indicates that natural habitat at these two locations has largely been converted to agriculture since the observations, and these areas are no longer suitable habitat for the species. Occurrence #547 (2002) is approximately 3 miles north of the BSA, separated from the BSA by at least three major roads and land cover entirely converted to crop agriculture, which is not suitable habitat for the species. Occurrence #882 (2008) is approximately 4 miles northeast of the BSA and is also separated from the BSA by at least two major roads, and a span of approximately 2 miles of crop agriculture. There are no suitable migratory corridors from known vernal pool habitat to the BSA, and the nearest potential habitat from the BSA is outside of their known dispersal range. There are no “wildlife occurrences” of CTS within the BSA per the SJVHCP (PG&E 2006).
Rana boylii	foothill yellow-legged frog	-	E	SSC	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Unlikely to occur. There is suitable habitat within Mokelumne River; however, this is outside of the BSA and separated from the project area by urban development. There are no CNDDB occurrences within 5 miles of the BSA.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Rana draytonii	California red-legged frog	T	-	-	Variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. Breeding sites of the California red-legged frog are in aquatic habitats, including pools and backwaters within streams and creeks, ponds, marshes, springs, sag ponds, dune ponds, and lagoons.	Unlikely to occur. There is only marginally suitable habitat within ponding areas of Bear Creek and adjacent upland dispersal areas. There are no CNDDB occurrences within 5 miles of the BSA and the BSA is approximately 16 miles outside of the USFWS's mapped current range of this species.
Spea hammondii	western spadefoot	-	-	SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Unlikely to occur. Marginally suitable grassland habitat is present within the BSA. There are no vernal pools within the BSA. There are three CNDDB occurrences within 5 miles of the BSA; however, these are located more than 4 miles to the east of the BSA.
Reptiles						
Emys marmorata	western pond turtle	-	-	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.3 mile from water for egg-laying.	Unlikely to occur. Marginally suitable aquatic habitat is present within the BSA in Bear Creek and Paddy Creek. There are no CNDDB occurrences within 5 miles of the BSA.
Thamnophis gigas	giant gartersnake	T	-	-	Agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley.	Absent. Suitable breeding habitat does not exist in the BSA or within 5 miles. Isolated from potential breeding habitat by urban development.
Birds						
Agelaius tricolor	tricolored blackbird	BCC	T	-	Found in areas near water, such as marshes, grasslands, and wetlands. They require some sort of substrate nearby to build nests. This substrate is often in the form of aquatic vegetation. They also need foraging areas, which can consist of grassland or agricultural pastures such as rice, grain, or alfalfa.	Potential to occur. There is suitable habitat present along canals within the BSA. There are four CNDDB occurrences within 5 miles of the BSA.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Aquila chrysaetos	golden eagle	-	-	FP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Unlikely to occur. Suitable habitat is not present. Potential to occur would be limited to flyovers.
Athene cunicularia	burrowing owl	BCC	-	SSC	Open, dry annual or perennial grasslands with low-growing vegetation and on the margins of disturbed/developed habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Potential to occur. Suitable habitat is present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Buteo swainsoni	Swainson's hawk	BCC	T	-	Suitable foraging habitat includes a variety of agriculture crops, grassland, and pasture. Alfalfa fields are more routinely used by foraging Swainson's hawks than any other crop type. Suitable nesting habitat includes trees within mature riparian forest or corridors, lone oak trees and oak groves, and mature roadside trees (man-made structures).	Likely to occur. There is suitable foraging habitat within the BSA throughout the agriculture areas. There are 38 CNDDB occurrences within 5 miles of the BSA.
Coccyzus americanus	yellow-billed cuckoo	T	-	-	Wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes.	Absent. Suitable nesting habitat does not exist in the BSA or within 5 miles. Isolated from potential breeding habitat by urban development.
Elanus leucurus	white-tailed kite	-	-	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows for foraging close to isolated, dense-topped trees for nesting and perching.	Potential to occur. There is suitable foraging habitat present within the BSA and species is likely to fly over. There are no CNDDB occurrences within 5 miles of the BSA; however, this species is often not reported to CNDDB.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Haliaeetus leucocephalus	bald eagle	D	E	FP	Prefer living in areas close to bodies of water, as their favorite prey is fish. They can be found in wetlands, on the coasts, near lakes or rivers, and in marshes. When perching, roosting, and nesting, bald eagles prefer hardwoods, like oak trees, or coniferous, like pine trees. They appear to select trees based on height and sturdiness.	Unlikely to occur. Preferred nesting and foraging habitat are not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Icteria virens	yellow-breasted chat	-	-	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian area consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Laterallus jamaicensis coturniculus	California black rail	-	T	FP	Freshwater marshes, wet meadows, and shallow margins of saltwater marshes. Needs water depth of about 1 inch that does not fluctuate during the year and dense vegetation for nesting habitat.	Absent. Suitable nesting habitat does not exist in the BSA or within 5 miles. Isolated from potential breeding habitat by urban development.
Melospiza melodia	song sparrow ("Modesto" population)	-	-	SSC	Endemic to California, residing only in the north-central portion of the Central Valley. Inhabit riparian habitat with moderately dense vegetation to supply cover for nest sites, a source of standing or running water, semi-open canopies to allow light, and exposed ground or leaf litter for foraging.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Riparia riparia	bank swallow	BCC	T	-	Nesting colonies dug into the sides of sandy cliffs or banks or pick them out of mixed swallow flocks as they catch insects over the water.	Potential to occur. Suitable habitat is present within the BSA. There is one CNDDB occurrence within 5 miles of the BSA.
Setophaga petechia	yellow warbler	-	-	SSC	Breed in shrubby thickets and woods, particularly along watercourses and in wetlands. Common trees include willows, alders, and cottonwoods across North America.	Potential to occur. Suitable habitat is present within the BSA. There is one CNDDB occurrence within 5 miles of the BSA.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		
Vireo bellii pusillus	least Bell's vireo	E	E		Summer resident of southern California in low riparian habitat in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, and mesquite.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Mammals						
Antrozous pallidus	pallid bat	-	-	SSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Unlikely to occur. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Sylvilagus bachmani riparius	riparian brush rabbit	E	-	-	Riparian areas including dense thickets of wild rose, willows, and blackberries on the San Joaquin River in northern Stanislaus County.	Unlikely to occur. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Taxidea taxus	American badger	-	-	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents.	Absent. Suitable habitat requirements are not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Scientific Name	Common Name	Status*			Habitat	Potential for Occurrence in BSA
		Federal	State	CDFW		

*Status designations are as follows:

Federal Designations:

(E) Federally Endangered, (T) Federally Threatened, (C) Candidate, (D) Delisted, (BCC) Bird of Conservation Concern

State Designations:

(E) State Endangered, (T) State Threatened, (CE) Candidate Endangered

California Department of Fish and Wildlife (CDFW) Designations:

(SSC) Species of Special Concern, (FP) Fully Protected, Watch List (WL)

Sources:

California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database, Biogeographic Data Branch. California Department of Fish and Wildlife. Sacramento, CA. Accessed May 3, 2023. https://www.wildlife.ca.gov/data/cnddb.

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Query Criteria: Quad IS (Linden (3812111) OR Lockeford (3812122) OR Waterloo (3812112) OR Lodi North (3812123) OR Lodi South (3812113) OR Clay (3812132) OR Goose Creek (3812131) OR Clements (3812121) OR Wallace (3812028) OR Valley Springs SW (3812018) OR Farmington (3712088) OR Peters (3712181) OR Stockton East (3712182) OR Stockton West (3712183) OR Galt (3812133) OR Bruceville (3812134) OR Thornton (3812124) OR Terminous (3812114))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acipenser medirostris pop. 1 green sturgeon - southern DPS	AFCAA01031	Threatened	None	G2T1	S1	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Agrostis hendersonii Henderson's bent grass	PMPOA040K0	None	None	G2Q	S2	3.2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S1	
Andrena subapasta An andrenid bee	IIHYM35210	None	None	G1G2	S1S2	
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos myrtifolia Ione manzanita	PDERI04240	Threatened	None	G1	S1	1B.2
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G2	S2	
Bombus pensylvanicus American bumble bee	IIHYM24260	None	None	G3G4	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S4	
Calycadenia hooveri Hoover's calycadenia	PDAST1P040	None	None	G2	S2	1B.3
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAPI0M051	None	None	G5T4T5	S2?	2B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2T3	S3	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eryngium pinnatisectum Tuolumne button-celery	PDAPI0Z0P0	None	None	G2	S2	1B.2
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S2	
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Horkelia parryi Parry's horkelia	PDROS0W0C0	None	None	G2	S2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S3	SSC
Ione Chaparral Ione Chaparral	CTT37D00CA	None	None	G1	S1.1	
Juncus leiospermus var. ahartii Ahart's dwarf rush	PMJUN011L1	None	None	G2T1	S1	1B.2
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S2	FP
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3	
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Limosella australis Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia pop. 1 song sparrow ("Modesto" population)	ABPBXA3013	None	None	G5T3?Q	S3?	SSC
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Navarretia myersii ssp. myersii pincushion navarretia	PDPLM0C0X1	None	None	G2T2	S2	1B.1
Navarretia paradoxiclara Patterson's navarretia	PDPLM0C150	None	None	G2	S2	1B.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Orcuttia viscida Sacramento Orcutt grass	PMPOA4G070	Endangered	Endangered	G1	S1	1B.1
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G3	S3	SSC
Rana boylii pop. 5 foothill yellow-legged frog - south Sierra DPS	AAABH01055	Proposed Endangered	Endangered	G3T2	S2	
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S3	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Scutellaria galericulata marsh skullcap	PDLAM1U0J0	None	None	G5	S2	2B.2
Scutellaria lateriflora side-flowering skullcap	PDLAM1U0Q0	None	None	G5	S2	2B.2
Setophaga petechia yellow warbler	ABPBX03010	None	None	G5	S3S4	SSC
Spea hammondii western spadefoot	AAABF02020	None	None	G2G3	S3S4	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sylvilagus bachmani riparius riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S3	

Record Count: 82

CNPS Rare Plant Inventory

CALIFORNIA NATIVE PLANT SOCIETY

Search Results

39 matches found. Click on scientific name for details

Search Criteria: Quad is one of [3812111:3812122:3812112:3812123:3812132:3812131:3812121:3812028:3812018:3712088:3712181:3712182:3712183:3812113:3812133:3812134:3812124:3812114]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED
Agrostis hendersonii	Henderson's bent grass	Poaceae	annual herb	Apr-Jun	None	None	G2Q	S2	3.2		1974-01-01
Arctostaphylos myrtifolia	Ione manzanita	Ericaceae	perennial evergreen shrub	Nov-Mar	FT	None	G1	S1	1B.2	Yes	1974-01-01
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	Yes	1994-01-01
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	Yes	1988-01-01
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual/perennial herb	Aug	None	None	G5	S4	4.2		1994-01-01
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	None	None	G1G2	S1S2	1B.1	Yes	1994-01-01
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	G5	S3	2B.3		2010-10-27
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	Yes	2019-01-07
Calycadenia hooveri	Hoover's calycadenia	Asteraceae	annual herb	Jul-Sep	None	None	G2	S2	1B.3	Yes	1980-01-01
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01
Castilleja campestris var. succulenta	succulent owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	(Mar)Apr-May	FT	CE	G4?T2T3	S2S3	1B.2	Yes	1984-01-01
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2	Yes	2007-05-22
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	FE	CE	G1	S1	1B.1	Yes	1974-01-01
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1		1974-01-01
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	G2?	S2?	1B.2	Yes	1988-01-01
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		1980-01-01
Eryngium pinnatisectum	Tuolumne button-celery	Apiaceae	annual/perennial herb	May-Aug	None	None	G2	S2	1B.2	Yes	1974-01-01

Eryngium racemosum	Delta button-celery	Apiaceae	annual/perennial herb	(May)Jun-Oct	None	CE	G1	S1	1B.1	Yes	1974-01-01
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1988-01-01
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		1974-01-01
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	1974-01-01
Horkelia parryi	Parry's horkelia	Rosaceae	perennial herb	Apr-Sep	None	None	G2	S2	1B.2	Yes	1974-01-01
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	None	None	G2T1	S1	1B.2	Yes	1984-01-01
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	G3	S3	4.2	Yes	2001-01-01
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	Yes	1974-01-01
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	Yes	1974-01-01
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	Yes	1974-01-01
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1		1994-01-01
Navarretia myersii ssp. myersii	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	None	None	G2T2	S2	1B.1	Yes	1994-01-01
Navarretia paradoxiclara	Patterson's navarretia	Polemoniaceae	annual herb	May-Jun(Jul)	None	None	G2	S2	1B.3	Yes	2016-04-27
Orcuttia viscida	Sacramento Orcutt grass	Poaceae	annual herb	Apr-Jul(Sep)	FE	CE	G1	S1	1B.1	Yes	1974-01-01
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	None	None	G4	S3	4.2		1974-01-01
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01
Scutellaria galericulata	marsh skullcap	Lamiaceae	perennial rhizomatous herb	Jun-Sep	None	None	G5	S2	2B.2		1994-01-01
Scutellaria lateriflora	side-flowering skullcap	Lamiaceae	perennial rhizomatous herb	Jul-Sep	None	None	G5	S2	2B.2		1994-01-01
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	Yes	1974-01-01
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	2001-01-01
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	FE	CR	G1	S1	1B.1	Yes	1974-01-01

Showing 1 to 39 of 39 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 3 May 2023].

Marek, Mia

From:	Marek, Mia
Sent:	Wednesday, May 3, 2023 10:33 AM
To:	nmfs.wcrca.specieslist@noaa.gov
Subject:	Official Species List - Linden, Lockeford, Waterloo, and Lodi North

Hello, my name is Mia Marek and I am a biologist with Jacobs Engineering in Oakland, CA. I am requesting an official species list for the Northern San Joaquin 230 kV Transmission Project, which will provide a new 230 kV transmission system in northern San Joaquin County, in central California. I have copied and pasted the search results for a query I ran for the Linden, Lockeford, Waterloo, and Lodi North quadrants where the project is located. Below, you will find the results.

Quad Name **Linden**
Quad Number **38121-A1**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Waterloo**
Quad Number **38121-A2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -

CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Lodi North**
Quad Number **38121-B3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

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Pronouns: she/her

I respectfully acknowledge that we live and work on the traditional, ancestral & unceded land of Indigenous Peoples.
Whose land are you on?

Attachment B
Species Lists

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Northern San Joaquin 230 kV Transmission Project

LOCATION

San Joaquin County, California

DESCRIPTION

Some(new 230 kV transmission system)

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Riparian Brush Rabbit Sylvilagus bachmani riparius Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6189	Endangered

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus — Threatened

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/7850

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp Branchinecta lynchi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover Castilleja campestris ssp. succulenta Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8095	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow Passerculus sandwichensis beldingi This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Bullock's Oriole Icterus bullockii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 21 to Jul 25
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

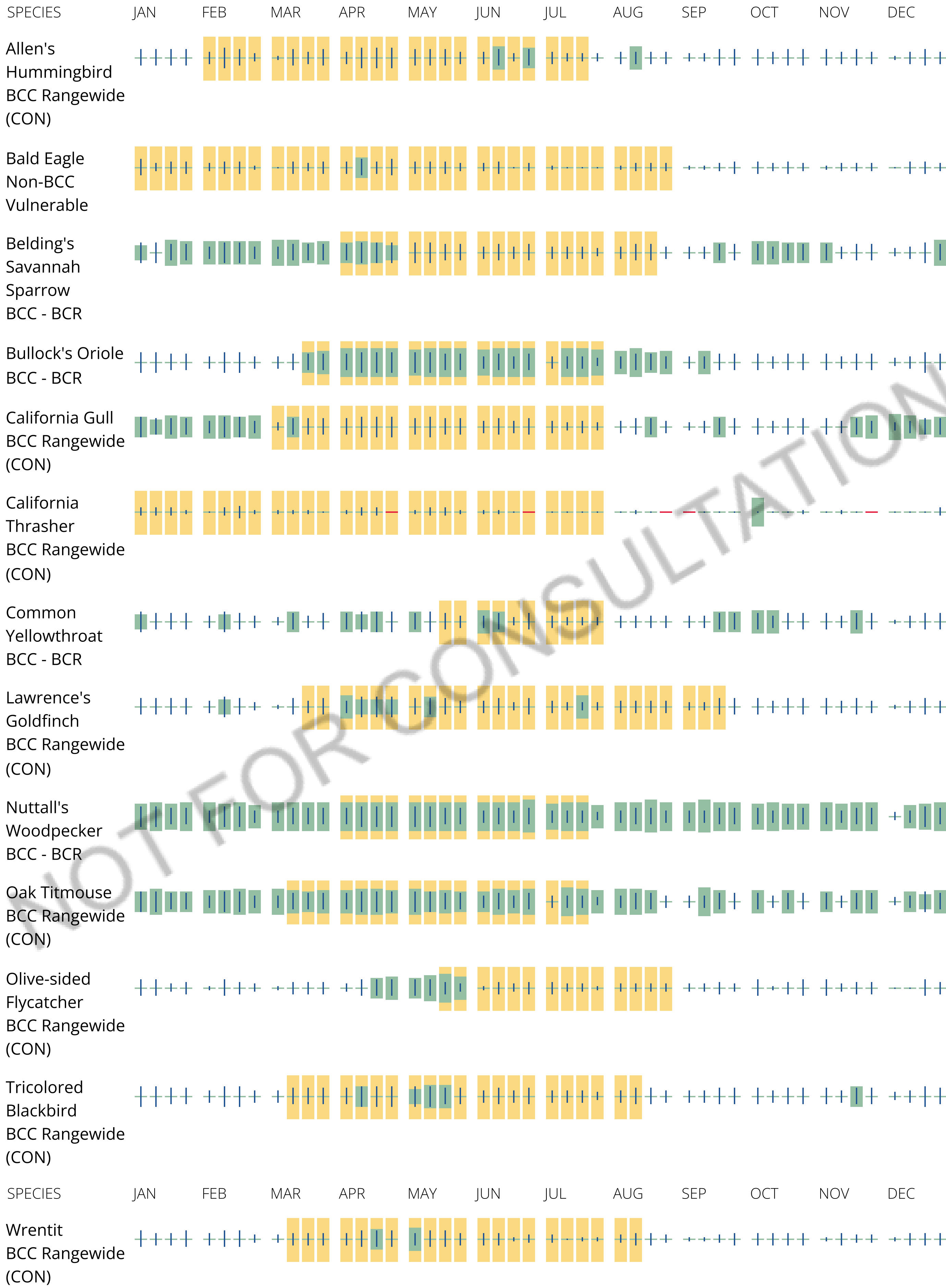
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

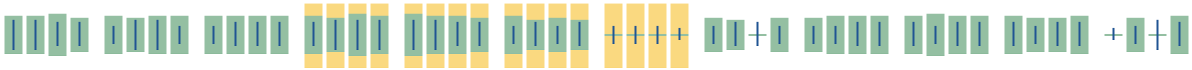
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data


SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Allen's Hummingbird BCC Rangewide (CON)
Bald Eagle Non-BCC Vulnerable
Belding's Savannah Sparrow BCC - BCR
Bullock's Oriole BCC - BCR
California Gull BCC Rangewide (CON)
California Thrasher BCC Rangewide (CON)
Common Yellowthroat BCC - BCR
Lawrence's Goldfinch BCC Rangewide (CON)
Nuttall's Woodpecker BCC - BCR
Oak Titmouse BCC Rangewide (CON)
Olive-sided Flycatcher BCC Rangewide (CON)
Tricolored Blackbird BCC Rangewide (CON)
SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Wrentit BCC Rangewide (CON)

Yellow-billed Magpie
BCC Rangewide (CON)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C4
Species Table

APPENDIX C4 – SPECIAL-STATUS SPECIES TABLES

The special-status species tables have been divided into plants (Table 1) and wildlife (Table 2).

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Agrostis hendersonii	Henderson's bent grass	-	-	3.2	Valley and foothill grassland (mesic) and vernal pools.	Apr-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Arctostaphylos myrtifolia	Ione manzanita	T	-	1B.2	Chaparral and cismontane woodland.	Nov-Mar	Absent. No suitable habitat is present within the BSA.
Astragalus tener var. tener	alkali milk vetch	-	-	1B.2	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands. In annual grassland or in playas or vernal pools.	Mar-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA, as do alkali flats. There is one historic occurrence in Stockton, but the BSA does not have alkali resources or vernal pools for this species to grow (Calflora 2022).
Atriplex cordulata var. cordulata	heartscale	-	-	1B.2	Saline soils, Alkaline scrub, Chenopod scrub, meadows and seeps, valley and foothill grassland.	Apr-Oct	Unlikely to occur. Scrub habitat is not present in the BSA, and although there are historic occurrences in the 'Stockton West' quad (Calflora 2022), suitable habitat has predominately been converted to agricultural development.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
							Additionally, saline soils suitable for this species are not present in the BSA.
Azolla microphylla	Mexican mosquito fern	-	-	4.2	Marshes and swamps (ponds, slow water).	Aug	Absent. Marshes and swamps are not present in the BSA.
Blepharizonia plumosa	big tarplant	-	-	1B.1	Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas.	Jul-Oct	Unlikely to occur. Calflora search results indicate a confirmed range within the BSA and one occurrence in the 'Stockton west' quad (Calflora 2022). However, suitable habitat such as slopes and burned areas are not present. Additionally, increasing agricultural development and urbanization has severely limited suitable habitat of this species.
Brasenia schreberi	watershield	-	-	2B.3	Marshes and swamps (freshwater). This plant is strictly aquatic.	Jun-Sep	Absent. Marshes and swamps are not present in the BSA.
Brodiaea rosea	valley brodiaea	-	-	4.2	Old alluvial terraces; silty, sandy, and gravelly loam. Valley and foothill grassland (swales) and vernal pools.	Apr-May (Jun)	Unlikely to occur. Calflora search results indicate a confirmed range within the project site area and an occurrence in the 'Clements' quad (Calflora 2022). However, suitable habitat has predominately been converted to vineyards and orchards which does not support habitat requirements of this species.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Calycadenia hooveri	Hoover's calycadenia	-	-	1B.3	Cismontane woodland and valley and foothill grassland.	Jul-Sep	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Carex comosa	bristly sedge	-	-	2B.1	Coastal prairie, marshes and swamps (lake margins), and valley and foothill grassland.	May-Sep	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Castilleja campestris var. succulenta	succulent owl's-clover	T	E	1B.2	Occurs usually in wetlands, occasionally in non-wetlands. Habitat is vernal pools (often acidic). Occurs in vernal pools with a variety of characteristics including small and large pools, bowl-shaped pools and swales, shallow and deep pools, and pools with short and long inundation periods. Vegetation communities include: valley grassland, foothill grassland, freshwater wetlands, wetland-riparian.	(Mar)Apr-May	Potential to occur. Although there are no CNDDB occurrences within 5 miles of the BSA, a reconnaissance survey conducted in early December of 2019 and an aquatic resources delineation conducted in April and May of 2021 indicated the presence of wetland features in portions of the BSA that could provide suitable habitat for this species. This species was not found during appropriately timed botanical surveys.
Centromadia parryi ssp. rudis	Parry's rough tarplant	-	-	4.2	Occurs in alkaline and vernally mesic soils in seeps, valley and foothill grassland, vernal pools, and sometimes roadsides.	May-Oct	Unlikely to occur. The BSA does not have alkali resources for this species to grow and there are no CNDDB occurrences within 5 miles of the BSA.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Chloropyron palmatum	palmate-bracted bird's-beak	E	E	1B.1	Occurs in alkaline soils, grows in saline-alkaline soils in seasonally flooded lowland plains and basins at elevations of less than 500 feet. Associated plant species include iodine bush (*Allenrolfea occidentalis*), alkali heath (*Frankenia salina*), Great Valley gum plant (*Grindelia camporum*), and Parry's rough tarplant (*Centromadia parryi ssp.rudis*). Vegetation communities include: chenopod scrub, valley grassland, foothill grassland.	May-Oct	Absent. No suitable habitat is present within the BSA.
Cicuta maculata var. bolanderi	Bolander's water-hemlock	-	-	2B.1	Marshes and swamps (brackish, coastal, freshwater).	Jul-Sep	Absent. No marshes or swamps are present within the BSA.
Delphinium recurvatum	recurved larkspur	-	-	1B.2	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbrush or valley chenopod scrub.	Mar-Jun	Absent. Calflora search results indicate a possible range within the BSA and an occurrence in the 'Stockton East' quad (Calflora 2022). However, no suitable habitat or a confirmed range overlap is present.
Downingia pusilla	dwarf downingia	-	-	2B.2	Occurs in wetlands. Habitat is vernal pools (no acidic preference) and wet ditches. Vegetation communities include: foothill woodland, valley	Mar-May	Unlikely to occur. Calflora search results indicate a possible range within the project site area, an occurrence in the 'Stockton East' quad, and the possible occurrence of

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
					grassland, freshwater wetlands, wetland-riparian.		suitable habitat. However, there are no CNDDB occurrences within 5 miles of the BSA. Rare plant surveys need to be conducted to verify the presence or absence of this species.
Eryngium pinnatisectum	Tuolumne button-celery	-	-	1B.2	Cismontane woodland, lower montane coniferous forest, and vernal pools.	May-Aug	Absent. No suitable habitat is present within the BSA.
Eryngium racemosum	Delta button-celery	-	E	1B.1	Riparian scrub. Seasonally inundated floodplains on clay.	Jun-Oct	Absent. Riparian scrub and floodplains do not exist in the BSA.
Extriplex joaquinana	San Joaquin spearscale	-	-	1B.2	Alkaline soils, chenopod scrub. meadows and seeps, playas, valley and foothill grassland.	Apr-Oct	Unlikely to occur. There is only marginally suitable habitat present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Gratiola heterosepala	Boggs Lake hedge-hyssop	-	E	1B.2	Found predominately growing in clay soils, marshes and swamps (lake margins). Vernal pools.	Apr-Aug	Absent. Marshes and swamps do not occur in the BSA. Additionally, the closest extant populations of this species occur in Solano and Sacramento counties (Calflora 2022).
Hesperevax caulescens	hogwallow starfish	-	-	4.2	Valley and foothill grassland (mesic clay) and vernal pools (shallow)	Mar-Jun	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Hibiscus lasiocarpos var. occidentalis	wooly rose-mallow	-	-	1B.2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks and low peat islands in sloughs; can also occur on riprap and levees.	Jun-Sep	Absent. Marshes and swamps are not present in the BSA.
Horkelia parryi	Parry's horkelia	-	-	1B.2	Chaparral and cismontane woodland.	Apr-Sep	Absent. No suitable habitat is present within the BSA.
Juncus leiospermus var. ahartii	Ahart's dwarf rush	-	-	1B.2	Valley and foothill grassland (mesic).	Mar-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Lasthenia ferrisiae	Ferris' goldfields	-	-	4.2	Vernal pools (alkaline, clay).	Feb-May	Absent. No suitable habitat is present within the BSA.
Lathyrus jepsonii var. jepsonii	delta tule pea	-	-	1B.2	Found in freshwater and brackish marshes; most often in ditches and along levees near Napa. Often found with *Typha*, *Aster lentus*, *Rosa californica*, *Juncus* spp., *Scripus* spp., etc. Usually on marsh and slough edges.	May-Jul	Absent. The closest recorded observations of this species occur in western Lodi and Stockton (Calflora 2022), however, suitable habitat such as marshland sloughs are not present in the BSA.
Legenere limosa	legenere	-	-	1B.1	Occurs below elevations of 610 meters in vernal pools and wetlands. Vegetation communities include: valley grassland, freshwater wetlands, wetland-riparian.	Apr-Jun	Unlikely to occur. There is only marginally suitable wetland habitat present in the BSA. There are no CNDDDB occurrences within 5 miles of the BSA.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			
Lilaeopsis masonii	Mason's lilaeopsis	-	R	1B.1	Found in freshwater and brackish marshes and in riparian scrub habitats; found along the margins of Napa River	Apr-Nov	Absent. This species grows predominately along the margins of Napa River (Calflora 2022).
Limosella australis	Delta mudwort	-	-	2B.1	Marshes and swamps (brackish, freshwater) and riparian scrub.	May-Aug	Absent. No suitable habitat is present within the BSA.
Navarretia myersii ssp. myersii	pincushion navarretia	-	-	1B.1	Vernal pools. Clay soils within non-native grassland.	Apr-May	Absent. This species predominantly occurs in the foothill grasslands of the Sierra Nevada (Calflora 2022).
Navarretia paradoxiclara	Patterson's navarretia	-	-	1B.3	Meadows and seeps.	May-Jun(Jul)	Absent. No suitable habitat is present within the BSA.
Orcuttia viscida	Sacramento Orcutt grass	E	E	1B.2	Occurs in wetlands. Habitat is vernal pools (often acidic). Vegetation communities include: valley grassland, freshwater wetlands, wetland-riparian.	Apr-Jul(Sep)	Absent. The closest extant populations occur in Placer, Sacramento, and El Dorado Counties outside of the BSA (Calflora 2022).
Ranunculus lobbii	Lobb's aquatic buttercup	-	-	4.2	Cismontane woodland, north Coast coniferous forest, valley and foothill grassland, and vernal pools.	Feb-May	Unlikely to occur. Low quality, disturbed, and ruderal grassland exists throughout the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Sagittaria sanfordii	Sanford's arrowhead	-	-	1B.2	Occurs in wetlands, marshes and swamps (assorted shallow freshwater). Vegetation communities include freshwater wetlands, wetland-riparian.	May-Oct(Nov)	Potential to occur. Marginally suitable habitat is present in the BSA adjacent to aquatic resources such as creeks, canals, and ditches. There is one CNDDB occurrence within 5 miles of the BSA. The species was

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CNPS	Habitat	Blooming Period	Potential for Occurrence within the BSA
							not observed during appropriately timed botanical surveys.
Scutellaria galericulata	marsh skullcap	-	-	2B.2	Lower montane coniferous forest, meadows and seeps (mesic), and marshes and swamps.	Jun-Sep	Absent. No suitable habitat is present within the BSA.
Scutellaria lateriflora	side-flowering skullcap	-	-	2B.2	Meadows and seeps (mesic) and marshes and swamps.	Jul-Sep	Absent. No suitable habitat is present within the BSA.
Symphyotrichum lentum	Suisun marsh aster	-	-	1B.2	Found in brackish and freshwater marshes and swamps. Most often seen along sloughs with *Phragmites, Scripus, Rubus, Typha*, etc.	May-Nov	Unlikely to occur. Calflora search results indicate occurrences in the 'Stockton West', 'Stockton East', and 'Lodi South' quads (Calflora 2022). However, marshes and swamps are not present in the BSA.
Trifolium hydrophilum	saline clover	-	-	1B.2	Occurs in marshes and swamps, vernal pools and valley and foothill grassland. Mesic, alkaline sites.	Apr-Jun	Absent. Most recent observations of this species are within the Suisun and San Pablo bays (Calflora 2022). Suitable habitat is not considered present in the BSA.
Tuctoria greenei	Greene's Tuctoria	E	R	1B.1	Vernal pools.	May-Jul(Sep)	Absent. This species has recorded occurrences in Stockton and Farmington in 1936 (Calflora 2022). However, this species is considered extirpated from the BSA because of increased agricultural development and urbanization.

Table 1. Special-Status Plant Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
		Federal	State	CNPS			

[a]Status designations are as follows:
Federal Designations:
(E) Federally Endangered; (T) Federally Threatened
State Designations:
(E) State Endangered; (R) Rare
California Native Plant Society (CNPS) California Rare Plant Rank (CRPR):
(1A) Presumed extinct in California
(1B) Rare, threatened, or endangered in California and elsewhere
(2B) Rare, threatened, or endangered in California, but more common elsewhere
(3) More information is needed
(4) Limited distribution
Threat Rank:
0.1 Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
0.2 Moderately threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)
0.3 Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)
Sources:
California Department of Fish and Wildlife (CDFW). 2023. California Natural Diversity Database, Biogeographic Data Branch. California Department of Fish and Wildlife. Sacramento, CA. Accessed May 3, 2023. https://www.wildlife.ca.gov/data/cnddb.
California Native Plant Society (CNPS). 2023. Online Inventory of Rare, Threatened and Endangered Plants of California. Accessed May 3, 2023. http://www.rareplants.cnps.org/advanced.html
California Native Plant Society Calflora Database (Calflora). 2022. "'What Grows Here' online application for documented ranges and occurrences of rare and endangered plants of California." Accessed August 29, 2022. https://www.calflora.org/.
U.S. Fish and Wildlife Service (USFWS). 2023. Environmental Conservation Online System: Information, Planning and Conservation System (IPaC), 2023. Accessed May 3, 2023. https://ecos.fws.gov/ipac/.

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CDFW	Habitat	Likelihood of Presence in BSA
Invertebrates						
Bombus crotchii	Crotch bumble bee	-	CE	-	Range extends from coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	Unlikely to occur. Habitat for this species, including annual grassland, small mammal burrows, and floral host plants, occurs within the BSA. However, the species is thought to be absent from much of its historic range in the Central Valley (Hatfield et. al. 2014). Additionally, current land use in the BSA has degraded potential habitat to very low quality.
Branchinecta conservatio	Conservancy fairy Shrimp	E	-	-	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains in rain-filled vernal pools and swales.	Unlikely to occur. Suitable vernal pool habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA, and per the most recent 5-year review of the species, the closest known population is greater than 20 miles away (USFWS 2012). Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CDFW	Habitat	Likelihood of Presence in BSA
						and are no longer considered suitable habitat.
Branchinecta lynchi	vernal pool fairy shrimp	T	-	-	Endemic to the grasslands of the central valley, central coast mountains, and south coast mountains in rain-filled vernal pools and swales.	Unlikely to occur. Suitable vernal pool and swale habitat is not present within the BSA. There is one CNDDB occurrence (#925) within 5 miles of the BSA. This occurrence is located within known vernal pools 4 miles east of the BSA and is separated from the BSA by at least 1.8 miles of crop agriculture. This species has been known to occur in roadside ditches and similar areas, but this is often in proximity to higher quality vernal pool habitat. In addition, no roadside ditches or swales will be affected by project activities. Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard and are no longer considered suitable habitat.
Desmocerus californicus dimorphus	valley elderberry	T	-	-	Valley elderberry longhorn beetles are found in riparian habitat only in the	Potential to occur. Host plant, elderberry (*Sambucus* sp.) occurs

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CDFW	Habitat	Likelihood of Presence in BSA
	longhorn beetle				vicinity of their host plant, the elderberry (*Sambucus* species).	in the BSA. There are five CNDDB occurrences within 5 miles of the BSA.
Lepidurus packardi	vernal pool tadpole shrimp	E	-	-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools. Commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Unlikely to occur. Suitable vernal pool and swale habitat is not present within the BSA. There is one CNDDB occurrence (#210) within 5 miles of the BSA. This occurrence has no location or ecological setting details and is based on one specimen collected in 1990. Aerial imagery indicates that aside from the Mokelumne River, the occurrence area has been nearly entirely converted to crop agriculture, which is not suitable habitat for this species. Per the PG&E SJVHCP, the only 'habitat areas' that would be suitable for this species are potential vernal pools at the eastern portion of the project (PG&E 2006). These areas have been converted to vineyard and are no longer considered suitable habitat.
Fish						

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		
Acipenser medirostris	Green sturgeon – southern DPS	T	-	-	Spawns in the Sacramento, Feather, and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. The San Francisco Estuary is important for rearing juveniles.	Absent. Suitable habitat is not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Hypomesus transpacificus	delta smelt	T	E	-	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities <2 ppt.	Absent. Suitable habitat is not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Oncorhynchus mykiss irideus	steelhead - Central Valley DPS	T	-	-	7 inches is the minimum depth required for successful migration of adult steelhead although the distance fish must travel through shallow water areas is also a critical factor. Spawning ranges from 6 to 24 inches with an average of 14 inches. Substrates from 0.2 to 4.0 inches in diameter. Temperature requirement of 39 to 52°F.	Unlikely to occur. There is only marginally suitable habitat in the BSA within Bear Creek and Paddy Creek. There are two CNDDB occurrences within 5 miles of the BSA within large rivers including Mokelumne River and Lower Calaveras River.
Pogonichthys macrolepidotus	Sacramento splittail	-	-	SSC	Estuarine habitat. Requires a rising hydrograph for upstream migration and flooded vegetation for spawning and rearing areas.	Unlikely to occur. There is marginally suitable habitat in the BSA within Bear Creek and Paddy Creek. There is one CNDDB occurrence within 5 miles of the BSA in the lower Mokelumne River.

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	Status[a] State	Status[a] CDFW	Habitat	Likelihood of Presence in BSA
Spirinchus thaleichthys	longfin smelt	C	T	-	Euryhaline, nektonic, and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	Absent. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Amphibians						
Ambystoma californiense	California tiger salamander	T	T	WL	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma Counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	Unlikely to occur. There are four CNDDB occurrences within 5 miles of the BSA; however, these have been within known vernal pool habitat. Vernal pools are not present within the BSA. Two CNDDB occurrences are historic (#280 from 1973, #289 from 1925). Aerial imagery indicates that natural habitat at these two locations has largely been converted to agriculture since the observations, and these areas are no longer suitable habitat for the species. Occurrence #547 (2002) is approximately 3 miles north of the BSA, separated from the BSA by at least three major roads and land cover entirely converted to crop agriculture, which is not suitable habitat for the species. Occurrence #882 (2008) is

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CDFW	Habitat	Likelihood of Presence in BSA
						approximately 4 miles northeast of the BSA and is also separated from the BSA by at least two major roads, and a span of approximately 2 miles of crop agriculture. There are no suitable migratory corridors from known vernal pool habitat to the BSA, and the nearest potential habitat from the BSA is outside of their known dispersal range. There are no "wildlife occurrences" of CTS within the BSA per the SJVHCP (PG&E 2006).
Rana boylii	foothill yellow-legged frog	-	E	SSC	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Unlikely to occur. There is suitable habitat within Mokelumne River; however, this is outside of the BSA and separated from the project footprint by urban development. There are no CNDDB occurrences within 5 miles of the BSA.
Rana draytonii	California red-legged frog	T	-	SSC	Variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. Breeding sites of the California red-legged frog are in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes,	Unlikely to occur. There is only marginally suitable habitat within ponding areas of Bear Creek and adjacent upland dispersal areas. There are no CNDDB occurrences within 5 miles of the BSA and the BSA is approximately 16 miles

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		
					springs, sag ponds, dune ponds and lagoons.	outside of the USFWS's mapped current range of this species.
Spea hammondii	western spadefoot	-	-	SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Unlikely to occur. Marginally suitable grassland habitat is present within the BSA. There are no vernal pools within the BSA. There are three CNDDB occurrences within 5 miles of the BSA; however, these are located over 4 miles to the east of the BSA.
Reptiles						
Emys marmorata	western pond turtle	-	-	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.3 mile from water for egg-laying.	Unlikely to occur. Marginally suitable aquatic habitat is present within the BSA in Bear Creek and Paddy Creek. There are no CNDDB occurrences within 5 miles of the BSA.
Thamnophis gigas	giant gartersnake	T	-	-	Agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley.	Absent. Suitable breeding habitat does not exist in the BSA or within 5 miles. Isolated from potential breeding habitat by urban development.
Birds						
Agelaius tricolor	tricolored blackbird	BCC	T	SSC	Found in areas near water, such as marshes, grasslands, and wetlands. They require some sort of substrate nearby to build nests. This substrate is	Potential to occur. There is suitable nesting habitat present along canals and creeks within the BSA, and suitable foraging habitat

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a] Federal	State	CDFW	Habitat	Likelihood of Presence in BSA
					often in the form of aquatic vegetation. They also need foraging areas, which can consist of grassland or agricultural pastures such as rice, grain, or alfalfa.	in grassland habitats and agricultural areas. There are four CNDDB occurrences within 5 miles of the BSA.
Aquila chrysaetos	golden eagle	-	-	FP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Unlikely to occur. Suitable habitat is not present. Potential to occur would be limited to fly overs.
Athene cunicularia	burrowing owl	BCC	-	SSC	Open, dry annual or perennial grasslands with low-growing vegetation and on the margins of disturbed/developed habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Potential to occur. Suitable habitat is present in the BSA, including burrows along the margins of vineyards, orchards, and other agricultural developments. There are no CNDDB occurrences within 5 miles of the BSA.
Buteo swainsoni	Swainson's hawk	BCC	T	-	Suitable foraging habitat includes a variety of agriculture crops, grassland, and pasture. Alfalfa fields are more routinely used by foraging Swainson's hawks than any other crop type. Suitable nesting habitat includes trees within mature riparian forest or corridors, lone oak trees and oak groves, and mature roadside trees (man-made structures).	Likely to occur. There is suitable nesting and foraging habitat within the BSA in tall emergent trees and throughout agriculture areas. There are 38 CNDDB occurrences within 5 miles of the BSA.
Coccyzus americanus	yellow-billed cuckoo	T	-	-	Wooded habitat with dense cover and water nearby, including woodlands with	Absent. Suitable nesting habitat does not exist in the BSA or within

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		
					low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes.	5 miles. Isolated from potential breeding habitat by urban development.
Elanus leucurus	white-tailed kite	-	-	FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows for foraging close to isolated, dense-topped trees for nesting and perching.	Potential to occur. There is suitable foraging and nesting habitat present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA; however, this species is often not reported to CNDDB.
Haliaeetus leucocephalus	bald eagle	D	E	FP	Prefer living in areas close to bodies of water, as their favorite prey is fish. They can be found in wetlands, on the coasts, near lakes or rivers, and in marshes. When perching, roosting, and nesting, bald eagles prefer hardwoods, like oak trees, or coniferous, like pine trees. They appear to select trees based on height and sturdiness.	Unlikely to occur. Preferred nesting and foraging habitat are not present in the BSA. There are no CNDDB occurrences within 5 miles of the BSA; however, this species is often not reported to CNDDB.
Icteria virens	yellow-breasted chat	-	-	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Laterallus jamaicensis coturniculus	California black rail	-	T	FP	Freshwater marshes, wet meadows, and shallow margins of saltwater marshes. Needs water depth of about 1 inch that	Absent. Suitable nesting habitat does not exist in the BSA or within 5 miles. Isolated from potential

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		
					does not fluctuate during the year and dense vegetation for nesting habitat.	breeding habitat by urban development.
Melospiza melodia	song sparrow ("Modesto" population)	-	-	SSC	Endemic to California, residing only in the north-central portion of the Central Valley. Inhabit riparian habitat with moderately dense vegetation to supply cover for nest sites, a source of standing or running water, semi-open canopies to allow light, and exposed ground or leaf litter for foraging.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Riparia riparia	bank swallow	BCC	T	-	Nesting colonies dug into the sides of sandy cliffs or banks or pick them out of mixed swallow flocks as they catch insects over the water.	Potential to occur. Suitable foraging habitat is present within the BSA along natural and constructed watercourses. There is one CNDDB occurrence within 5 miles of the BSA.
Setophaga petechia	yellow warbler	-	-	SSC	Breed in shrubby thickets and woods, particularly along watercourses and in wetlands. Common trees include willows, alders, and cottonwoods across North America.	Potential to occur. Suitable foraging and nesting habitat are present within the BSA. There is one CNDDB occurrence within 5 miles of the BSA.
Vireo bellii pusillus	least Bell's vireo	E	E		Summer resident of southern California in low riparian habitat in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, and mesquite.	Unlikely to occur. Riparian habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Mammals						

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		
Antrozous pallidus	pallid bat	-	-	SSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Unlikely to occur. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Sylvilagus bachmani riparius	riparian brush rabbit	E	-	-	Riparian areas including dense thickets of wild rose, willows, and blackberries on the San Joaquin River in northern Stanislaus County.	Unlikely to occur. Suitable habitat is not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.
Taxidea taxus	American badger	-	-	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents.	Absent. Suitable habitat requirements are not present within the BSA. There are no CNDDB occurrences within 5 miles of the BSA.

[a]Status designations are as follows:
Federal Designations:
(E) Federally Endangered, (T) Federally Threatened, (C) Candidate, (D) Delisted, (BCC) Bird of Conservation Concern
State Designations:
(E) State Endangered, (T) State Threatened, (CE) Candidate Endangered
California Department of Fish and Wildlife (CDFW) Designations:
(SSC) Species of Special Concern, (FP) Fully Protected, Watch List (WL)
Sources:

Table 2. Special-Status Wildlife Species Identified in Records Searches

Scientific Name	Common Name	Status[a]			Habitat	Likelihood of Presence in BSA
		Federal	State	CDFW		

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Appendix C5
Species List

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Linden (3812111) OR Lockeford (3812122) OR Waterloo (3812112) OR Lodi North (3812123) OR Lodi South (3812113) OR Clay (3812132) OR Goose Creek (3812131) OR Clements (3812121) OR Wallace (3812028) OR Valley Springs SW (3812018) OR Farmington (3712088) OR Peters (3712181) OR Stockton East (3712182) OR Stockton West (3712183) OR Galt (3812133) OR Bruceville (3812134) OR Thornton (3812124) OR Terminous (3812114))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acipenser medirostris pop. 1 green sturgeon - southern DPS	AFCAA01031	Threatened	None	G2T1	S1	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Agrostis hendersonii Henderson's bent grass	PMPOA040K0	None	None	G2Q	S2	3.2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S1	
Andrena subapasta An andrenid bee	IIHYM35210	None	None	G1G2	S1S2	
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos myrtifolia Ione manzanita	PDERI04240	Threatened	None	G1	S1	1B.2
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G2	S2	
Bombus pensylvanicus American bumble bee	IIHYM24260	None	None	G3G4	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S4	
Calycadenia hooveri Hoover's calycadenia	PDAST1P040	None	None	G2	S2	1B.3
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAPI0M051	None	None	G5T4T5	S2?	2B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2T3	S3	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eryngium pinnatisectum Tuolumne button-celery	PDAPI0Z0P0	None	None	G2	S2	1B.2
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S2	
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Horkelia parryi Parry's horkelia	PDROS0W0C0	None	None	G2	S2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S3	SSC
Ione Chaparral Ione Chaparral	CTT37D00CA	None	None	G1	S1.1	
Juncus leiospermus var. ahartii Ahart's dwarf rush	PMJUN011L1	None	None	G2T1	S1	1B.2
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S2	FP
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3	
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Limosella australis Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia pop. 1 song sparrow ("Modesto" population)	ABPBXA3013	None	None	G5T3?Q	S3?	SSC
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Navarretia myersii ssp. myersii pincushion navarretia	PDPLM0C0X1	None	None	G2T2	S2	1B.1
Navarretia paradoxiclara Patterson's navarretia	PDPLM0C150	None	None	G2	S2	1B.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Orcuttia viscida Sacramento Orcutt grass	PMPOA4G070	Endangered	Endangered	G1	S1	1B.1
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G3	S3	SSC
Rana boylii pop. 5 foothill yellow-legged frog - south Sierra DPS	AAABH01055	Proposed Endangered	Endangered	G3T2	S2	
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S3	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Scutellaria galericulata marsh skullcap	PDLAM1U0J0	None	None	G5	S2	2B.2
Scutellaria lateriflora side-flowering skullcap	PDLAM1U0Q0	None	None	G5	S2	2B.2
Setophaga petechia yellow warbler	ABPBX03010	None	None	G5	S3S4	SSC
Spea hammondii western spadefoot	AAABF02020	None	None	G2G3	S3S4	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sylvilagus bachmani riparius riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S3	

Record Count: 82

CNPS Rare Plant Inventory

California Native Plant Society

Search Results

39 matches found. Click on scientific name for details

Search Criteria: Quad is one of [3812111:3812122:3812112:3812123:3812132:3812131:3812121:3812028:3812018:3712088:3712181:3712182:3712183:3812113:3812133:3812134:3812124:3812114]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED
Agrostis hendersonii	Henderson's bent grass	Poaceae	annual herb	Apr-Jun	None	None	G2Q	S2	3.2		1974-01-01
Arctostaphylos myrtifolia	Ione manzanita	Ericaceae	perennial evergreen shrub	Nov-Mar	FT	None	G1	S1	1B.2	Yes	1974-01-01
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	Yes	1994-01-01
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	Yes	1988-01-01
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual/perennial herb	Aug	None	None	G5	S4	4.2		1994-01-01
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	None	None	G1G2	S1S2	1B.1	Yes	1994-01-01
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	G5	S3	2B.3		2010-10-27
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	Yes	2019-01-07
Calycadenia hooveri	Hoover's calycadenia	Asteraceae	annual herb	Jul-Sep	None	None	G2	S2	1B.3	Yes	1980-01-01
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01
Castilleja campestris var. succulenta	succulent owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	(Mar)Apr-May	FT	CE	G4?T2T3	S2S3	1B.2	Yes	1984-01-01
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2	Yes	2007-05-22
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	FE	CE	G1	S1	1B.1	Yes	1974-01-01
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1		1974-01-01
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	G2?	S2?	1B.2	Yes	1988-01-01
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		1980-01-01
Eryngium pinnatisectum	Tuolumne button-celery	Apiaceae	annual/perennial herb	May-Aug	None	None	G2	S2	1B.2	Yes	1974-01-01

Eryngium racemosum	Delta button-celery	Apiaceae	annual/perennial herb	(May)Jun-Oct	None	CE	G1	S1	1B.1	Yes	1974-01-01
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1988-01-01
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		1974-01-01
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	1974-01-01
Horkelia parryi	Parry's horkelia	Rosaceae	perennial herb	Apr-Sep	None	None	G2	S2	1B.2	Yes	1974-01-01
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	None	None	G2T1	S1	1B.2	Yes	1984-01-01
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	G3	S3	4.2	Yes	2001-01-01
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	Yes	1974-01-01
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	Yes	1974-01-01
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	Yes	1974-01-01
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1		1994-01-01
Navarretia myersii ssp. myersii	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	None	None	G2T2	S2	1B.1	Yes	1994-01-01
Navarretia paradoxiclara	Patterson's navarretia	Polemoniaceae	annual herb	May-Jun(Jul)	None	None	G2	S2	1B.3	Yes	2016-04-27
Orcuttia viscida	Sacramento Orcutt grass	Poaceae	annual herb	Apr-Jul(Sep)	FE	CE	G1	S1	1B.1	Yes	1974-01-01
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	None	None	G4	S3	4.2		1974-01-01
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01
Scutellaria galericulata	marsh skullcap	Lamiaceae	perennial rhizomatous herb	Jun-Sep	None	None	G5	S2	2B.2		1994-01-01
Scutellaria lateriflora	side-flowering skullcap	Lamiaceae	perennial rhizomatous herb	Jul-Sep	None	None	G5	S2	2B.2		1994-01-01
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	Yes	1974-01-01
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	2001-01-01
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	FE	CR	G1	S1	1B.1	Yes	1974-01-01

Showing 1 to 39 of 39 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 3 May 2023].

Marek, Mia

From: Marek, Mia
Sent: Wednesday, May 3, 2023 10:33 AM
To: nmfs.wcrca.specieslist@noaa.gov
Subject: Official Species List - Linden, Lockeford, Waterloo, and Lodi North

Hello, my name is Mia Marek and I am a biologist with Jacobs Engineering in Oakland, CA. I am requesting an official species list for the Northern San Joaquin 230 kV Transmission Project, which will provide a new 230 kV transmission system in northern San Joaquin County, in central California. I have copied and pasted the search results for a query I ran for the Linden, Lockeford, Waterloo, and Lodi North quadrants where the project is located. Below, you will find the results.

Quad Name **Linden**
Quad Number **38121-A1**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Waterloo**
Quad Number **38121-A2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -

CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Lodi North**
Quad Number **38121-B3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

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Pronouns: she/her

I respectfully acknowledge that we live and work on the traditional, ancestral & unceded land of Indigenous Peoples.
Whose land are you on?

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Northern San Joaquin 230 kV Transmission Project

LOCATION

San Joaquin County, California

DESCRIPTION

Some(new 230 kV transmission system)

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Riparian Brush Rabbit Sylvilagus bachmani riparius Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6189	Endangered

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/7850

Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp Branchinecta lynchi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover Castilleja campestris ssp. succulenta Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8095	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow Passerculus sandwichensis beldingi This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Bullock's Oriole Icterus bullockii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 21 to Jul 25
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

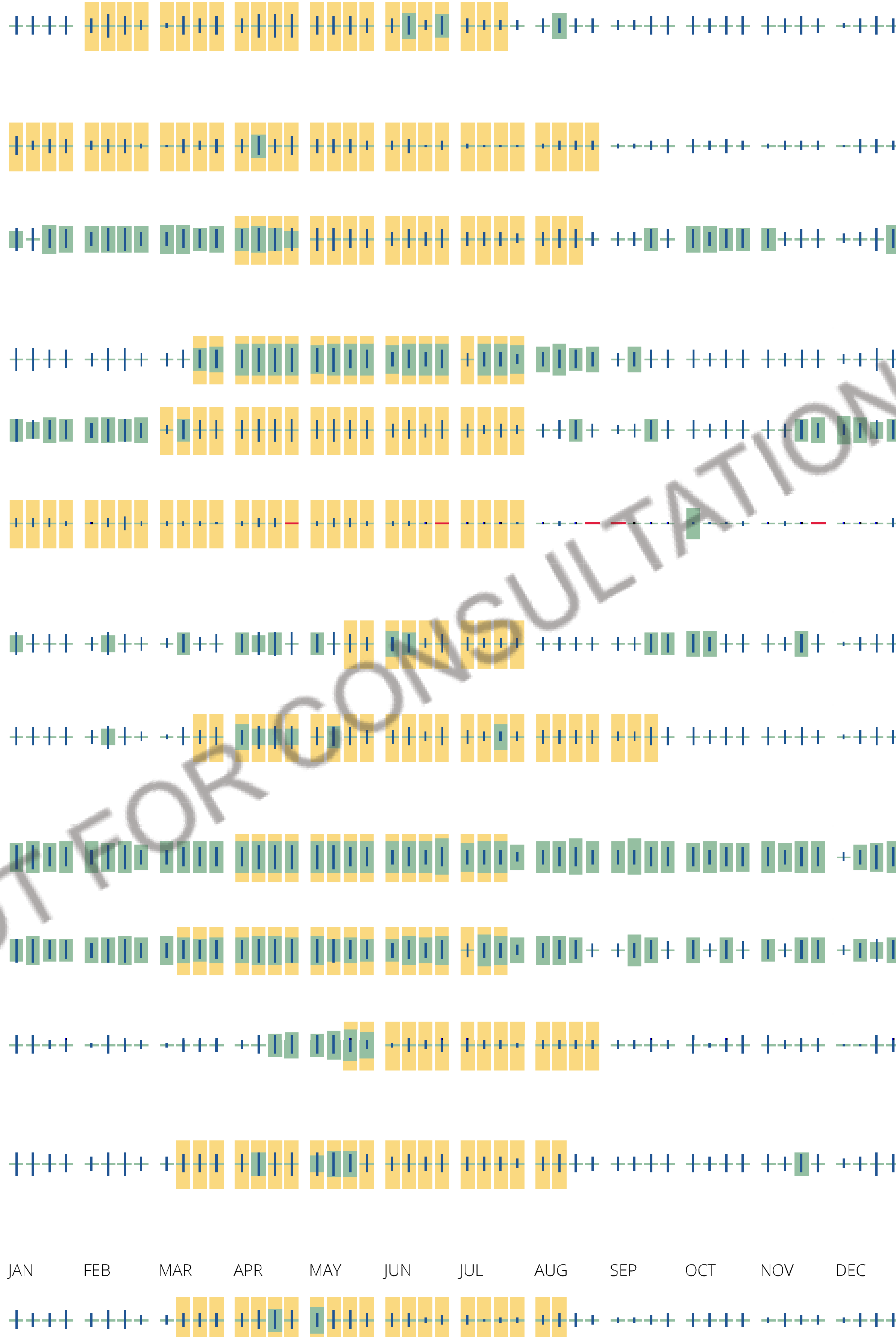
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

probability of presence breeding season | survey effort – no data

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



Allen's Hummingbird
BCC Rangewide (CON)

Bald Eagle
Non-BCC Vulnerable

Belding's Savannah Sparrow
BCC - BCR

Bullock's Oriole
BCC - BCR

California Gull
BCC Rangewide (CON)

California Thrasher
BCC Rangewide (CON)

Common Yellowthroat
BCC - BCR

Lawrence's Goldfinch
BCC Rangewide (CON)

Nuttall's Woodpecker
BCC - BCR

Oak Titmouse
BCC Rangewide (CON)

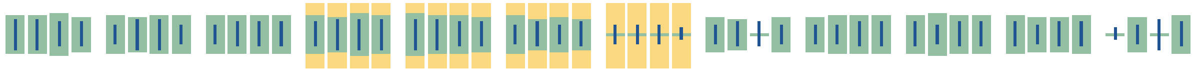
Olive-sided Flycatcher
BCC Rangewide (CON)

Tricolored Blackbird
BCC Rangewide (CON)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Wrentit
BCC Rangewide (CON)

Yellow-billed Magpie
BCC Rangewide
(CON)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C6
PG&E Nesting Bird Management Plan Summary

Nesting Birds: Species-Specific Buffers for PG&E Activities

Within PG&E's Avian Program, standard nest buffers were developed for all common and special-status birds present within its Service Territory. There are no standard nest buffers specified in the Migratory Bird Treaty Act (MBTA) or within California Fish and Game Code. Table 1 provides nest buffers based on the best available information, including relevant literature review and avian biology. Disturbance factors including *nest location*, *human activity*, *activity duration*, and *noise level* may influence nesting behavior and reproductive success, and were each considered in establishing standard buffer distances for individual species. Where regulatory agencies have provided information on nest buffer distances for special-status species, those buffer distances are primarily used as *standard buffers* in Table 1. *Standard buffers* are species-specific buffer distances between occupied nest sites and work activities where work will not occur while the nest is active (containing eggs or young). These standard buffers are intended to be applied to nests located in proximity to PG&E activities at a sufficient distance to provide suitable nest protection. For example, a nesting black-crowned night heron has a standard buffer distance of 400 feet (Table 1).

Because it is not always possible to apply the standard buffer, non-standard species-specific buffer distances have also been established. As part of the determination of these non-standard buffers, PG&E activities are assigned disturbance rankings (Low, Medium, or High) for each factor identified above. Evaluation of all disturbance factors combined produces an overall disturbance category by assessing each disturbance factor for one or more PG&E activities. If the overall disturbance category is high, the standard buffer will generally apply. If the evaluation results in low or medium overall disturbance categories, the standard buffer is applied as feasible or reduced buffers may be appropriate. For example, in some circumstances it may be necessary to perform certain types of work within the standard buffer. In these cases, biologists consider all relevant site-specific conditions, including the species' tolerance for disturbance, work activity type, noise levels, and distance to nest to determine if reducing the standard buffer is appropriate. Alternatively, the buffer may be increased beyond the standard buffer for certain exceptions. Helicopters are the main exception that may require increased buffers.

Table 1 lists the standard buffers and non-standard buffer ranges for activities with low-medium and medium-high disturbances. Nest buffers will be implemented and adjusted by the biologist[1].

The following site-specific conditions are considered in determining if a reduced or increased buffer is appropriate:

- **Disturbance**. Evaluate nest disturbance, including consideration of activity intensity and duration, construction type, amount of habitat disturbance, level of human disturbance or acclimation, activity length, and the amount of noise generated by the activity.
- **Existing Conditions**. Assess site conditions to determine if there is acclimation to human disturbance.
- **Nest Concealment**. Evaluate surrounding habitat for its ability to provide visual and/or acoustic barriers between the nest and construction.
- **Species Natural History**. Consider individual species' natural history, nest stage (incubation, rearing, fledging), and known tolerances to disturbance.
- **Habituation**. Consider species habituation to new or ongoing activities.
- **Environmental Conditions**. Consider weather and other related factors.
- **Helicopter Use.** Consider helicopter type, flight plans, and duration.

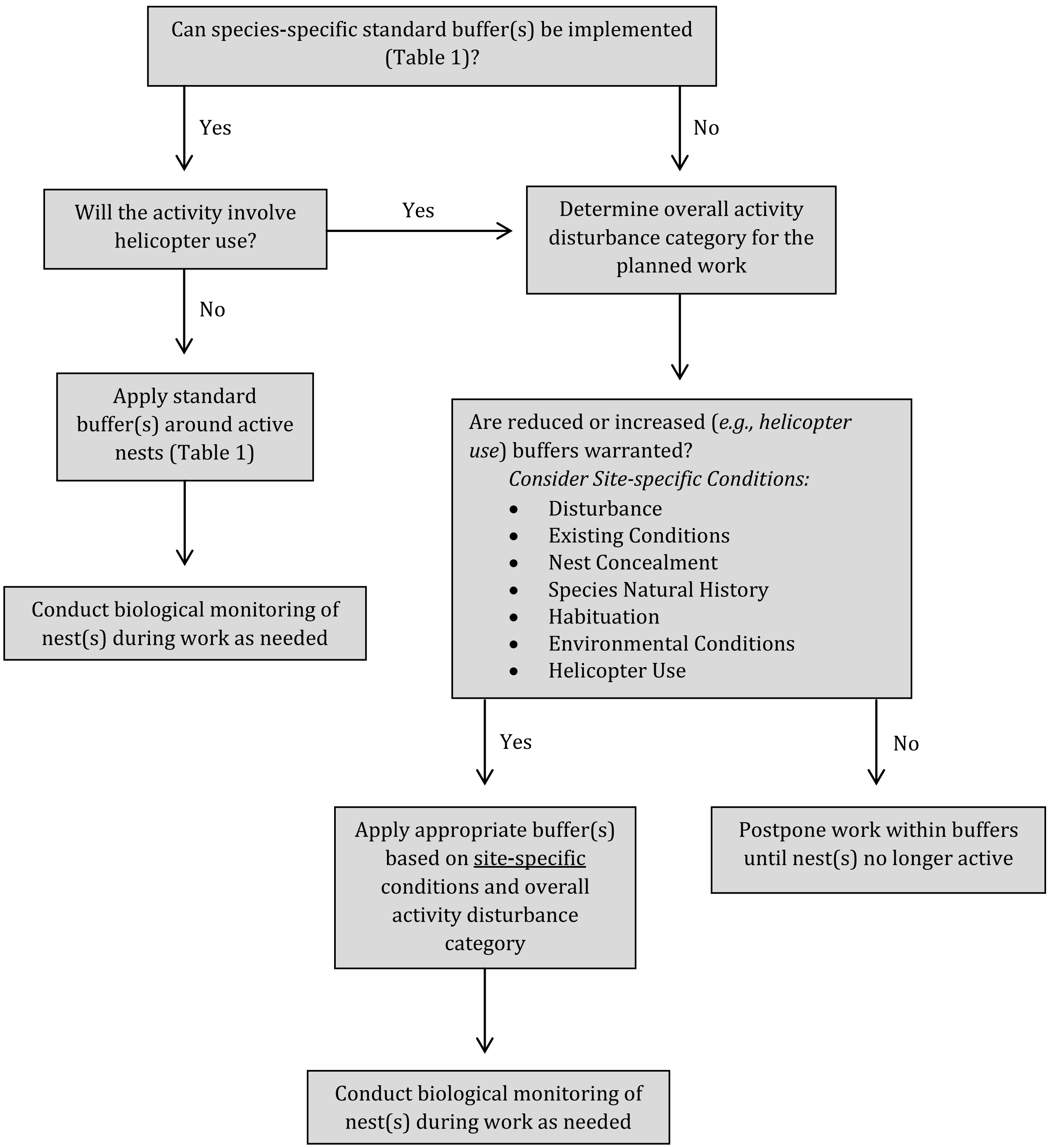
Nest Buffer Implementation Guidelines

Step/Task/Responsible	Outcome and Components
1. Desktop review *Biologist*	• Assess habitat types and potential nesting bird species • Identify potentially appropriate buffers for the species that may nest
2. Preconstruction nesting bird surveys *Biologist*	• Conduct preconstruction surveys within the standard buffers • Document species detections including nests and active nests
3. Assign Buffers *Biologist*	• Assess intensity/duration of activity • Assess acclimation to human disturbance • Assess site-specific conditions • Consider species' natural history, reproductive stage, tolerances to disturbance, and observed behavior • Evaluate and assign standard, reduced, or increased buffers
4. Implement Buffers *Biologist/Biological Monitor*	• Implement buffers when work activities are occurring • Conduct periodic biological monitoring where needed • Adjust buffers as appropriate

[1] Biologist refers to an individual with a bachelor's degree or above in a field related to biological sciences and demonstrated field expertise in ornithology, in particular, nesting behavior; these qualified biologists may be PG&E employees or contractors.

Species-Specific Buffers for PG&E Activities

Buffer Assignment Process – Quick Reference



Other Biological Considerations in Determining Buffers

- Provisioning frequency of hatchlings or older young
- Egg turning
- Egg incubation (female or male or combination)
- Egg hardiness
- Ambient Temperatures
- Heat tolerance (eggs or nestlings)
- Cold tolerance (eggs or nestlings)
- Unsheltered nest risk
- Premature fledging risk
- Unattended nests and predation risk

Time on Nest is Important. An egg initially requires a controlled heat input, but later in incubation the embryo may produce more heat and may need to be cooled rather than heated. Ambient temperatures need to be considered. Unattended unsheltered nests may experience temperature extremes (heat or cold). Egg turning during incubation is also a critical component for successful hatching; absence of turning during incubation will result in reduced and delayed hatching. During the nestling stage for altricial birds (i.e., birds that typically require feeding by adults), adults must provision food to nestlings. Provisioning rate is highly variable between species and is correlated to clutch size and body size, but most birds make frequent trips to attend nestlings. Collectively referred to as brooding, these forms of parental care are essential for reproductive success. Unattended nests also may experience increased rates of predation. Premature fledging is more likely to occur during later nest stages, when young are nearing fledging stage but not yet capable of flight.

Table 1. Species-specific Nest Buffers for PG&E Work Activities

**Atypically high-intensity activities, such as helicopter use usually require increased buffers beyond the standard buffer*

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Mallard	*Anas platyrhynchos*	Scrapes under overhanging cover or in dense vegetation in uplands near water.	Ground	March through June; single brood.	Clutch incubated for 26–29 days by female; young are precocial.	100	30–100	15–30
Cinnamon Teal	*Anas cyanoptera*	Scrapes under overhanging cover or in dense vegetation in uplands near water.	Ground	April through August; single brood.	Clutch incubated for 24–25 days by female; young are precocial.	100	30–100	15–30
Canada Goose	*Branta canadensis*	Scrapes on slightly elevated, firm ground in uplands near water.	Ground	February through June; single brood.	Clutch incubated for 27–28 days by female; young are precocial.	100	30–100	15–30
Wood Duck	*Aix sponsa*	Cavities in riparian woodlands and other woodland habitats near water.	Up to 60 feet	April through August; single or double brood.	Clutch incubated for 27–35 days by female; young are precocial.	100	30–100	15–30
Blue-winged Teal	*Anas discors*	Scrapes in dense grass or forbs in wetlands or grasslands near water.	Ground	June through July; single brood	Clutch incubated for 23–24 days by female; young are precocial.	100	30–100	15–30
Northern Shoveler	*Anas clypeata*	Scrapes in low grasses or forbs in uplands near water.	Ground	March through July; single brood.	Clutch incubated for 25–27 days by female; young are precocial.	100	30–100	15–30
Gadwall	*Anas strepera*	Scrapes in dense, low emergent vegetation or grasses in uplands near water.	Ground	April through July; single brood.	Clutch incubated for 22–29 days by female; young are precocial.	100	30–100	15–30
American Wigeon	*Anas americana*	Scrapes in dense vegetation cover in uplands near water.	Ground	May through July; single brood.	Clutch incubated for 24–25 days by female; young are precocial.	100	30–100	15–30

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Redhead	*Aythya americana*	Platform nests over water in dense vegetation; occasionally nests in uplands near water.	Ground	April through June; single brood.	Clutch incubated for 24–26 days by both sexes; young are precocial.	100	30–100	15–30
Ring-necked Duck	*Aythya collaris*	Platform nests over water in dense emergent vegetation in wetlands.	Ground	May through August; single brood.	Clutch incubated for approximately 26 days by female; young are precocial.	100	30–100	15–30
Common Merganser	*Mergus merganser*	Cavities in trees, snags and stumps in riparian woodlands.	Up to 200 feet	March through September; single brood.	Clutch incubated for 28–32 days by female; young are precocial.	100	30–100	15–30
Ruddy Duck	*Oxyura jamaicensis*	Platform nests constructed on shallow water in dense, tall emergent vegetation.	Ground	April through October; single or double brood.	Clutch incubated for approximately 23 days by female; young are precocial.	100	30–100	15–30
Pied-billed Grebe	*Podilymbus podiceps*	Platform nests constructed in emergent vegetation bordering open water.	Ground	March through July; double brood.	Clutch incubated for approximately 23 days by both sexes; young are precocial.	100	30–100	15–30
Eared Grebe	*Podiceps nigricollis*	Platform nests in water on emergent wetland vegetation.	Ground	April through July; single brood.	Clutch incubated for approximately 21 days by both sexes by both sexes; young are precocial.	100	30–100	15–30
Western Grebe	*Aechmophorus occidentalis*	Platform nests in emergent vegetation or open water or, less frequently, on dry land near water.	Ground	May through August; single brood.	Clutch incubated for approximately 23 days by both sexes; young are precocial.	100	30–100	15–30

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Clark's Grebe	*Aechmophorus clarkii*	Platform nests constructed in emergent vegetation or open water or, less frequently, on dry land near water.	Ground	May through August; single brood.	Clutch incubated for approximately 23 days by both sexes; young are precocial.	100	30–100	15–30
Double-crested Cormorant	*Phalacrocorax auritus*	Platform nests on islands, on the ground or in trees; also in power poles and other artificial structures. Colonial nester.	Ground	March through August; single brood.	Clutch incubated for 25–29 days by both sexes; altricial young fledge at 37–44 days.	400	75–400	50–75
Pelagic Cormorant	*Phalacrocorax pelagicus*	Platform nests on steep cliffs along rocky and exposed shorelines along outer coasts, bays, inlets, estuaries, rapids, coves, surge narrows, harbors, lagoons, and coastal log-storage sites. Colonial nester.	Ground	April through August; single or double brood	Clutch incubated for 28–32 days by both sexes; altricial young fledge at approximately 47 days	400	75–400	50–75
American Bittern	*Botaurus lentiginosus*	Platform nests in shallow water or on ground near water.	Ground	April through July; single brood.	Clutch incubated for approximately 24 days by female; altricial young fledge at approximately 14 days.	100	50–100	25–50
Least Bittern	*Ixobrychus exilis*	Platform nests about a foot above the water in freshwater marshes.	Ground	March through July; double brood.	Clutch incubated for 16–19 days by both sexes; altricial young fledge at 13–15 days.	100	50–100	25–50

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Great Blue Heron	*Ardea herodias*	Platform nests in tall trees or other types of vegetation near water. Colonial nester.	Up to 130 feet	January through July; single brood.	Clutch incubated for 25–29 days by both sexes; altricial young fledge at approximately 60 days.	400	75–400	50–75
Great Egret	*Ardea alba*	Platform nests in tall trees or other types of vegetation near water. Colonial nester.	10–80 feet	March through July; single brood.	Clutch incubated for approximately 26 days; semi-altricial young fledge at approximately 35–42 days.	400	75–400	50–75
Snowy Egret	*Egretta thula*	Platform nests in tall trees or other types of vegetation near water. Colonial nester.	Up to 30 feet but usually 10–15 feet	March through July; single brood.	Clutch incubated for 20–24 days by both sexes; semi-altricial young fledge at 21–28 days.	400	75–400	50–75
Cattle Egret	*Bubulcus ibis*	Platform nests in tall shrubs and trees near water.	Up to 30 feet but usually 5–15 feet	April to July; single brood.	Clutch incubated for 23–25 days; semi-altricial young fledge at about 40 days.	400	75–400	50–75
Green Heron	*Butorides striatus*	Platform nests in shrubs, trees, thickets, or other vegetation near water.	10–30 feet, sometimes higher	March through July; single or double brood.	Clutch incubated for 19–21 days by both sexes; semi-altricial young fledge at 21–23 days.	100	50–100	25–50
Black-crowned Night-Heron	*Nycticorax*	Platform nests in shrubs, trees, thickets, or other vegetation near water. Colonial nester.	Up to 150 feet	January through June; double brood.	Clutch incubated for approximately 24 days by female; semi-altricial young fledge at 42–49 days.	400	75–400	50–75
White-faced Ibis	*Plegadis chihi*	Platform nests of emergent wetland vegetation in extensive wetlands. Colonial nester.	Ground	May to July; single brood.	Clutch incubated for 20–26 days by both sexes; altricial young fledge at 10–12 days.	400	75–400	50–75

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Turkey Vulture	*Cathartes aura*	Caves, rock crevices, possibly abandoned buildings, or other dark, secluded sites.	Up to 20 feet	March through June; single brood.	Clutch incubated for 37–41 days by both sexes; semi-altricial young fledge at approximately 77 days.	300	100–300	50–100
California Condor	*Gymnogyps californianus*	Caves on high, remote cliff-faces or in hollow in large redwood snag.	Cliff	Year-round, with egg-laying usually occurring in January or February; single brood.	Clutch incubated for 42–50 days by both sexes; semi-altricial young fledge at 35–49 days.	3,960	CR[a]	CR
White-tailed Kite	*Elanus caeruleus*	Platform nests in tall trees near grasslands, oak savannah, or other open habitats.	12–60 feet	February through July; sometimes double brood.	Clutch incubated for 28–30 days by both sexes; semi-altricial young fledge at 34–40 days.	300	200–300	100–200
Osprey	*Pandion haliaetus*	Platform nests on treetops, rocky outcrops, or utility poles near water.	Up to 60 feet	Mid-March through August; single brood.	Clutch incubated for 32–33 days by both sexes; semi-altricial young fledge at 51–59 days.	300	100–300	50–100
Bald Eagle	*Haliaeetus leucocephalus*	Platform nests in large trees or rocky outcrops close to lakes and large rivers.	50–180 feet	January to August; single brood.	Clutch incubated for 35–46 days by both sexes; semi-altricial young fledge at 70–77 days.	2,640	CR	CR
Northern Harrier	*Circus cyaneus*	Platform nests on ground in grasslands and open marshland with vegetative cover.	Ground	March through August; single brood.	Clutch incubated for 29–39 days by both sexes; altricial young fledge at 37 days.	300	200–300	100–200
Sharp-shinned Hawk	*Accipiter striatus*	Platform nests in trees in riparian woodland or other forested habitat with thick cover.	10–60 feet	April through August; single brood.	Clutch incubated for 30–35 days by both sexes; semi-altricial young fledge at approximately 23 days.	300	100–300	50–100

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Cooper's Hawk	*Accipiter cooperii*	Platform nests in trees in riparian woodlands or other forested habitat.	20–60 feet	March through July; single brood.	Clutch incubated for 36 days by female while male provisions her; semi-altricial young fledge at 30–34 days.	300	100–300	50–100
Northern Goshawk	*Accipiter gentilis*	Platform nests in top of tall coniferous or deciduous trees in mature forest.	Up to 75 feet	April through August; single brood.	Clutch incubated for 36–41 days by female while male provisions her; semi-altricial young fledge at 45 days old	1,320	200–1,320	100–200
Red-shouldered Hawk	*Buteo lineatus*	Platform nests below canopy in a variety of tree species.	20–60 feet	March through June; single brood.	Clutch incubated for 23–25 days by both sexes; semi-altricial young fledge at 35–42 days.	300	100–300	50–100
Swainson's Hawk	*Buteo swainsoni*	Platform nests in isolated trees in grasslands and agricultural areas.	5–30 feet	April through late June; single brood.	Clutch incubated for approximately 28 days by both sexes; semi-altricial young fledge at 28–35 days.	1,320–2,640	CR	CR
Red-tailed Hawk	*Buteo jamaicensis*	Platform nests in tall trees and other structures in a variety of open habitats.	35–90 feet	February through September; single brood.	Clutch incubated for 28–32 days by both sexes; semi-altricial young fledge at approximately 42 days.	250	100–300	50–100
Ferruginous Hawk	*Buteo regalis*	Nest in substrates ranging from cliffs, trees, utility structures, and farm buildings to haystacks and relatively level ground.	Up to 70 feet	Early March through May; single brood	Clutch incubated for 32–33 days by both sexes; altricial and nidicolous young fledge at 38–50 days.	300	100–300	50–100

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Golden Eagle	*Aquila chrysaetos*	Platform nests on rock ledges of outcrops or cliffs, and occasionally trees, in proximity to grassland, farmland, oak savannah, and other foraging grounds.	10–100 feet or higher on cliffs	February through July; single brood.	Clutch incubated for 43–45 days by female and occasionally male; semi-altricial young fledge at 63–70 days.	2,640	CR	CR
American Kestrel	*Falco sparverius*	Cavities in trees or other structures near grasslands, agricultural areas, oak savannah, or other open areas.	7–80 feet	March through July; may double brood.	Clutch incubated for 29–30 days by female while male provisions her; semi-altricial young fledge at approximately 30 days.	200	50–200	25–50
Prairie Falcon	*Falco mexicanus*	Ledges under overhangs on rock outcrops or cliffs near grassland, farmland, oak savannah, or other foraging habitat.	30–40 feet	March to May; single brood.	Clutch incubated for 29–31 days by female while male provisions her; semi-altricial young fledge at 40 days.	300	100–300	50–100
American Peregrine Falcon	*Falco peregrinus*	Cliff ledges, tall buildings, high bridges, and other high locations near open habitats.	High on cliffs or tall structures	March through June; single brood.	Clutch incubated for 28–29 days by both sexes; semi-altricial young fledge at 35–42 days.	500	CR	CR
Mount Pinos Sooty Grouse	*Dendragapus fuliginosus*	Scrapes near logs, shrubs, or other cover in coniferous forests, shrub-steppe habitat, and subalpine forests.	Ground	April through August; single brood.	Clutch incubated for 26–28 days by female; young are precocial.	100	50–100	25–50
Ruffed Grouse	*Bonasa umbellus*	Scrapes near the base of stumps, trees, or logs in forested habitat.	Ground	February through August; single brood.	Clutch incubated for approximately 24 days by female; young are precocial.	100	50–100	25–50

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Wild Turkey	*Meleagris gallopavo*	Scrapes in thick, low vegetation in oak woodlands and forest edges and clearings.	Ground	March through August; single brood.	Clutch incubated for approximately 28 days by female; young are precocial.	100	30–100	15–30
Gambel's Quail	*Callipepla gambellii*	Scrapes under shrubs in desert habitats.	Ground	April through June; single or (rarely) double brood	Clutch incubated for 21–23 days by female while male guards; young are precocial.	100	50–100	25–50
California Quail	*Callipepla californica*	Scrapes under shrubs in riparian woodland, coastal scrub, chaparral, shrub-steppe, and mixed-hardwood forest.	Ground	March through July; single or double brood.	Clutch incubated for 21–23 days by female; young are precocial.	100	50–100	25–50
Mountain Quail	*Oreortyx pictus*	Scrapes under shrubs in mountain woodland and scrub habitats, usually near water.	Ground	April through June; single brood.	Clutch incubated for 24–25 days by female; young are precocial.	100	50–100	25–50
California Black Rail	*Laterallus jamaicensis coturniculus*	Cup nests on or near ground at upper edges of tidal marshes.	0–1 foot	March through July; single brood.	Clutch incubated for 17–20 days by both sexes; young are semi-precocial.	300–600	CR	CR
Clapper Rail (California, Yuma, Light-footed)	*Rallus longirostris obscurus/yumanensis/levipes*	Platform nests in dense tidal marsh vegetation dominated by cordgrass or gumplant.	0–1 foot	February through August; single or double brood.	Clutch incubated for 23–29 days by both sexes; young are semi-precocial.	700	CR	CR
Virginia Rail	*Rallus limicola*	Platform nests in dense emergent vegetation in freshwater or estuarine marshes.	0–1 foot	April through June; single or double brood.	Clutch incubated for 14–16 days by both sexes; young are precocial.	100	50–100	25–50
Sora	*Porzana carolina*	Cup nests secured to reeds and rushes in freshwater or estuarine marshes.	0–1 foot	April through August; single brood.	Clutch incubated for approximately 14 days by both sexes; young are precocial.	100	50–100	25–50

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Common Gallinule	*Gallinula galeata*	Platform nests in dense vegetation at edge of marshes and other freshwater habitats.	Ground or water level	April through June; single or double brood.	Clutch incubated for 19–22 days by both sexes; young are precocial.	100	50–100	25–50
American Coot	*Fulica americana*	Platform nests in dense vegetation at edge of marshes and other freshwater habitats.	Ground or water level	March through July; single or double brood.	Clutch incubated for 21–24 days by both sexes; young are precocial.	100	30–100	15–30
Greater Sandhill Crane	*Grus canadensis tabida*	Platform nests in wetland vegetation on dry ground or shallow water in extensive marsh systems or grasslands.	Ground	April through August; single brood.	Clutch incubated for approximately 30 days by both sexes; young are precocial.	500	CR	CR
Western Snowy Plover	*Charadrius alexandrinus nivosus*	Scrapes on sand beaches/bars, salt pannes, or dry river beds.	Ground	April through August; double or triple brood.	Clutch incubated for approximately 24 days by both sexes; young are precocial.	600 (coastal) 300 (interior)	CR (coastal) 200–300 (interior)	CR (coastal) 100–200 (interior)
Killdeer	*Charadrius vociferus*	Scrapes in open places usually in areas with short grass, sand, or gravel.	Ground	March through June; sometimes double brood.	Clutch incubated for 24–26 days by both sexes; young are precocial.	75	30–75	15–30
Black-necked Stilt	*Himantopus mexicanus*	Scrapes or plant tufts/ tussocks in fresh, brackish, or salt marshes.	Ground	April through June; single brood.	Clutch incubated for 25–26 days by both sexes; young are precocial.	150	50–150	25–50
American Avocet	*Recurvirostra americana*	Scrapes on salt pannes, dikes, levees, and bare islands.	Ground	April through June; single brood.	Clutch incubated for 22–24 days by both sexes; young are precocial.	150	50–150	25–50

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Spotted Sandpiper	*Actitis macularia*	Scrapes in grasses among rocks, wrack, or driftwood.	Ground	April through August; single brood.	Clutch incubated for approximately 21 days by male; young are precocial.	75	30–75	15–30
Wilson’s Snipe	*Gallinago gallinago*	Scrapes in dense, medium to tall marshy or wet meadow vegetation.	Ground	April to August; single brood.	Clutch incubated for 17–20 days by female; young are precocial.	75	30–75	15–30
Lesser Yellowlegs	*Tringa flavipes*	Scrapes on shallow wetlands, trees or shrubs, and open areas.	Ground	Late April to mid-May; single brood.	Clutch incubated for 22–23 days by both sexes; young are precocial.	75	30–75	15–30
Whimbrel	*Numenius phaeopus*	Hummocks or mounds near dwarfed shrub, flat heath tundra, in grass or sedge tussocks, and on gravel.	Ground	Early June to early July; single brood.	Clutch incubated 22–28 days by both sexes; young are precocial.	75	30–75	15–30
Black Skimmer	*Rynchops niger*	Saucer-shaped depressions on beaches, bars, dredge deposition, salt marsh.	Ground	May through August; single brood.	Clutch incubated 21–23 days by both sexes; young are semi-precocial.	300	100–300	50–100
Long-billed Curlew	*Numenius americanus*	Scrapes in short-grass or mixed-prairie habitat with flat to rolling topography.	Ground	Mid-late March to early July; single brood.	Clutch incubated for 27–29 days by both sexes; young are precocial.	75	30–75	15-30
Marbled Godwit	*Limosa fedoa*	Scrapes in short, sparsely to moderately vegetated landscapes that include native grassland and wetland complexes with a variety of wetland classes (ephemeral to semipermanent).	Ground	Mid-May to late June; single brood.	Clutch incubated for 23–26 days by both sexes; young are precocial	75	30–75	15–30

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California Gull	*Larus californicus*	Scrapes on islands in alkali or freshwater lakes and ponds or salt ponds.	Ground	April through August; single brood.	Clutch incubated for 23–27 days by both sexes; young are precocial.	150	50–150	25–50
Western Gull	*Larus occidentalis*	Ledges on cliffs, bluffs, bridges, buildings, and other areas inaccessible to nest predators.	Ground/cliff	April through August; single brood.	Clutch incubated for 30–32 days by both sexes; young are semi-precocial.	150	50–150	25–50
Caspian Tern	*Sterna caspia*	Scrapes on islands, beaches, and levees.	Ground	April through August; single brood.	Clutch incubated for approximately 20 days by both sexes; semi-precocial young fledge at approximately 14 days.	300	100–300	50–100
Forster's Tern	*Sterna forsteri*	Scrapes on open levees, islands, and occasionally reed beds.	Ground	April through September; single brood.	Clutch incubated for approximately 23 days by both sexes; semi-altricial young fledge after approximately 7 days.	300	100–300	50–100
California Least Tern	*Sterna antillarum*	Scrapes on bare sandy or gravelly substrates in undisturbed areas.	Ground	May through June; single brood.	Clutch incubated for 20–25 days by both sexes; young are semi-precocial.	600	CR	CR
Black Tern	*Chlidonias niger*	Platform nests constructed of dead plant stems in freshwater wetlands and flooded rice fields.	Ground	May through August; single brood.	Clutch incubated for 20–22 days by both sexes; semi-precocial young fledge at approximately 14 days.	300	100–300	50–100

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Marbled Murrelet	*Brachyramphus marmoratus*	Horizontal limbs of large, old-growth conifers.	20–250 feet	March through September; likely a single brood.	Clutch incubated for approximately 30 days by both sexes; semi-precocial young fledge at approximately 21 days.	1,320 (high disturbance)[b]	CR	CR
Cassin's Auklet	*Ptychoramphus aleuticus*	Excavates burrows in soft soil, sod or natural cavities such as rock crevices and under trees, cacti or logs. Colonial nester.	Ground/cliff	Varies within November through May; single and double brood.	Clutch incubated 37–42 days by both sexes; altricial young confined to nest for 30 days.	400	75–400	50–75
Band-tailed Pigeon	*Columba fasciata*	Platform nests in trees or shrubs in oak woodlands, mixed hardwood forests, and mixed coniferous forests, usually in areas with oak trees.	5–180 feet	March through November; double or triple brood.	Clutch incubated for 18–20 days by both sexes; altricial young fledge at 25–30 days.	75	50–75	25–50
Mourning Dove	*Zenaida macroura*	Platform nests in a tree or shrub, but also on buildings or on ground, in a variety of habitats.	0–25 feet	February through September; several broods.	Clutch incubated for 14–15 days by both sexes; altricial young fledge at 13–15 days.	50	20–50	10–20
Western Yellow-billed Cuckoo	*Coccyzus americanus*	Platform nests in bushes or trees in dense, wide riparian woodlands.	2–20 feet	June through July; single brood.	Clutch incubated for 9–11 days by both sexes; altricial young fledge at 21 days.	500	CR	CR
Greater Roadrunner	*Geococcyx californianus*	Cup nests in dense, brushy habitats in desert, sagebrush, and chaparral habitats.	3–15 feet	April through June; double brood.	Clutch incubated for 16–20 days by male; altricial young fledge at 18–30 days.	100	50–100	25–50

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Barn Owl	*Tyto alba*	Cavities in trees, buildings, crevices in rocks, outcrops, cliffs and quarries.	1–400 feet	January through May; often double broods.	Clutch incubated for 32–34 days by female while male provisions her; altricial young fledge at 60 days.	150	100–150	50–100
Flammulated Owl	*Otus flammeolus*	Cavities in trees, including aspens, oaks, pines, or other trees in forested areas.	10–40 feet	May through October; single brood.	Clutch incubated for 21–24 days by female while male provisions her; altricial young fledge at 20–26 days	200	100–200	50–100
Western Screech Owl	*Otus kennicottii*	Cavities in trees, particularly cottonwoods, in open woodlands.	10–30 feet	March through June; single brood.	Clutch incubated for 21–30 days by female while male provisions her; altricial young fledge at approximately 28 days.	200	100–200	50–100
Great Gray Owl	*Strix nebulosa*	Near high elevation meadows, on broken top trees or stick nests of other species.	30-50 feet	Late March through early July; single brood	Average clutch incubated for 29.7 days by female, with male provisioning her; semi-precocial young fledge at 21-28 days but can be dependent on nest site and male parent until fall.	1,320	CR	CR
Great Horned Owl	*Bubo virginianus*	Cavities or large nest platforms of other species in trees, rock ledges, or caves.	Uses existing platforms at various heights	January through May; single brood.	Clutch incubated for 26–35 days by female while male provisions her; altricial young fledge at 28–35 days.	300	100–300	50–100

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Northern Pygmy Owl	*Glaucidium gnoma*	Cavities in trees in oak woodlands and coniferous forests.	8–20 feet	April through August; number of broods unknown.	Clutch incubated for 25–30 days by female while male provisions her; semi-altricial young fledge at approximately 23 days.	200	50–200	25–50
Spotted Owl (Northern/California)	*Strix occidentalis caurina/occidentalis*	Cavities or platforms (natural or old nests of other species) in coniferous or mixed hardwood forests.	30–165 feet	March through August; single brood.	Clutch incubated for 29–30 days by female while male provisions her; altricial young fledge at 34–36 days.	1,320 (high disturbance)[b]	CR	CR
Burrowing Owl	*Athene cunicularia*	Small mammal burrows in open grasslands or at the edge of agricultural areas.	Ground	February through August; single brood.	Clutch incubated for 27–30 days by female while male provisions her; altricial young fledge at 40–45 days.	250	CR	CR
Long-eared Owl	*Asio otus*	Platform nests built by other species high in trees in coniferous forests or mixed woodlands.	10–30 feet	February through May; single brood.	Clutch incubated for 25–30 days by female while male provisions her; altricial young fledge at 23–24 days.	300	100–300	50–100
Short-eared Owl	*Asio flammeus*	Scrapes in tall, dense vegetation in grasslands and freshwater or brackish marshes.	Ground	March through July; single or possibly double brood.	Clutch incubated for 21–28 days by female while male provisions her; semi-altricial young leave nest at 31–36 days.	300	100–300	50–100
Northern Saw-whet Owl	*Aegolius acadicus*	Cavities in trees in forested areas.	5–50 feet	March through August; single or double brood.	Clutch incubated for 21–28 days by female; semi-altricial young fledge at approximately 30 days.	200	100–200	50–100

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Lesser Nighthawk	*Chordeiles acutipennis*	Scrapes on bare gravelly or sandy ground in desert and sparsely vegetated habitats.	Ground	April through July; single or double brood.	Clutch incubated for 18–19 days by female; semi-precocial young fledge after 3 weeks.	75	30–75	20–30
Common Nighthawk	*Chordeiles minor*	Scrapes on bare gravelly or sandy ground in open areas within chaparral, grasslands, and forest openings.	Ground	June through July; double brood.	Clutch incubated for 18–20 days by female; semi-precocial young fledge after about 21 days.	75	30–75	20–30
Common Poorwill	*Phalaenoptilus nuttallii*	Scrapes on bare gravelly, sandy, or leaf-litter-covered ground in grasslands and desert habitats.	Ground	March through August; double brood.	Clutch incubated for 20–21 days by both sexes; young are precocial.	75	30–75	20–30
Black Swift	*Cypseloides niger*	Sheltered crevices or ledges on cliff faces on coast or under waterfall.	20–45 feet	May through September; single brood.	Clutch incubated for 21–27 days by both sexes; altricial young fledge at 45–49 days.	75	30–75	15–30
Vaux's Swift	*Chaetura vauxi*	Cavities in redwoods, other conifers, and occasionally sycamores, chimneys, and buildings.	Up to 50 feet	May through August; single brood.	Clutch incubated for 18–20 days; altricial young fledge at approximately 28 days.	75	30–75	15–30
White-throated Swift	*Aeronautes saxatalis*	Rock cracks and crevices on cliffs and tall bridges.	10–195 feet	May through July; single brood.	Clutch incubated for 20–27 days; altricial young fledge at 40–46 days.	75	30–75	15–30
Black-chinned Hummingbird	*Arcgilochus alexandri*	Cup nests in trees and shrubs in woodlands, urban areas, and other habitats with nectar sources.	4–10 feet	April through June; two or three broods.	Clutch incubated for 13–16 days by female; altricial young fledge at approximately 21 days.	50	20–50	15–20

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Anna's Hummingbird	*Calypte anna*	Cup nests in trees and shrubs in woodlands, urban areas, and other habitats with nectar sources.	1–30 feet	December through June; two or three broods.	Clutch incubated for 16–17 days by female; altricial young fledge at 25–26 days.	50	20–50	15–20
Costa's Hummingbird	*Calypte costae*	Cup nests in trees and shrubs in riparian scrub, urban areas, and other habitats with nectar sources.	4–5 feet	April through July; single or occasionally double brood.	Clutch incubated for 15–18 days by female; altricial young fledge at 20–23 days.	50	20–50	15–20
Calliope Hummingbird	*Stellula calliope*	Cup nests in montane or riparian woodlands.	2–70 feet	May through August; single brood.	Clutch incubated for 15–16 days by female; altricial young fledge at 21–23 days.	50	20–50	15–20
Allen's Hummingbird	*Selasphorus sasin*	Cup nests in shrubs, trees, or vines in a variety of forest and woodland types, as well as coastal scrub.	1–10 feet; occasionally as high as 90 feet	February through August; double brood.	Clutch incubated for 16–22 days by female; altricial young fledge at approximately 22 days.	50	20–50	15–20
Belted Kingfisher	*Ceryle alcyon*	Burrow in banks near fresh water.	Ground	April through July; single brood.	Clutch incubated for 23–24 days by both sexes; altricial young fledge at 30–35 days.	100	50–100	25–50
Lewis's Woodpecker	*Melanerpes lewis*	Cavities in snags or dead branches in oak woodlands and mixed hardwood forests.	5–80 feet	May through July; single brood.	Clutch incubated for 13–14 days by both sexes; altricial young fledge at 28–34 days.	50	15–50	10–15
Acorn Woodpecker	*Melanerpes formicivorous*	Cavities in trees or snags in open woodlands, partly wooded areas, or utility poles near a source of acorns.	5–25 feet	April through July; two or three broods.	Clutch incubated for approximately 11 days by both sexes; altricial young fledge at approximately 31 days.	50	15–50	10–15

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Red-breasted Sapsucker	*Sphyrapicus ruber*	Cavities in trees or snags in coniferous or mixed forest.	5–45 feet	May through June; single brood.	Clutch incubated for 12–14 days by both sexes; altricial young fledge at 23–28 days.	50	15–50	10–15
Williamson's Sapsucker	*Sphyrapicus thyroideus*	Tree cavities in conifer and mixed conifer-deciduous forests.	8–52 feet	Late April through late July; single brood.	Clutch incubated 12–14 days by both sexes; altricial young fledge at 31–32 days.	50	15–50	10–15
Ladder-backed Woodpecker	*Picoides scalaris*	Cavities in trees and cactus.	4-20 feet	Unknown in CA; single brood.	Clutch incubated 14 days by both sexes; altricial young with unknown fledging period.	50	15–50	10–15
Nuttall's Woodpecker	*Picoides nuttallii*	Cavities in trees or snags in oak woodlands, or less frequently riparian or other woodlands.	2–60 feet	April through June; single brood.	Clutch incubated for approximately 14 days by both sexes; altricial young fledge at approximately 29 days.	50	15–50	10–15
Downy Woodpecker	*Picoides pubescens*	Cavities in trees or snags in riparian or other deciduous woodlands, or less frequently in coniferous forests.	3–44 feet	April through May; double brood.	Clutch incubated for approximately 12 days by both sexes; altricial young fledge at 20–22 days.	50	15–50	10–15
Hairy Woodpecker	*Picoides villosus*	Cavities in snags or dead branches in woodlands and coniferous forests.	3–102 feet	March through August; single brood.	Clutch incubated for 11–15 days by both sexes; altricial young fledge at 28–30 days.	50	15–50	10–15
White-headed Woodpecker	*Picoides albolarvatus*	Cavities in snags or stumps at least 2 feet in diameter in pine forests.	6–50 feet	April through August; single brood.	Both sexes incubate clutch for 13–15 days; altricial young fledge at approximately 26 days.	50	15–50	10–15

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Northern Flicker	*Colaptes auratus*	Cavities in tree trunks or snags in open or sparsely wooded areas; more often in live wood.	8–45 feet	April through June; single brood.	Clutch incubated for 11–13 days by both sexes; altricial young fledge at 25–28 days.	50	15–50	10–15
Pileated Woodpecker	*Dryocopus pileatus*	Cavities in snags or dead branches in mature forests.	15–70 feet	March to July; single brood	Clutch incubated for approximately 18 days by both sexes; altricial young fledge at 26–28 days.	50	15–50	10–15
Olive-sided Flycatcher	*Contopus cooperi*	Cup nest in trees in open conifer forest or mixed woodland.	5–70 feet	June through July; single brood.	Clutch incubated for 16–17 days by female; altricial young fledge at 15–19 days.	75	30–75	15–30
Western Wood-Pewee	*Contopus sordidulus*	Cup nests in trees, mainly coniferous but sometimes deciduous woodlands near watercourses.	15–30 feet	May through July; single brood.	Clutch incubated for approximately 12 days by female; altricial young fledge at 14–18 days.	75	30–75	15–30
Willow Flycatcher (Southwestern, Little, *adastus*)	*Empidonax traillii extimus/brewsteri/adastus*	Cup nests in densely vegetated riparian associations of cottonwoods and willows.	5–20 feet	May through July; single brood.	Clutch incubated for 12–13 days by female; altricial young fledge at 14 days.	300	CR	CR
Vermilion Flycatcher	*Pyrocephalus rubinus*	Loosely constructed nest in wooded riparian areas.	8-55 feet	Mid-March through mid-July; single or double brood.	Clutch incubated for 14-15 days by female; altricial young fledge at 14-16 days.	75	30–75	15–30
Hammond's Flycatcher	*Empidonax hammondii*	Cup nests in trees in forests and woodlands.	6–65 feet	May through July; single brood.	Clutch incubated for 12–15 days by female; altricial young fledge at 17–18 days .	75	30–75	15–30

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Dusky Flycatcher	*Empidonax oberholseri*	Cup nests in small trees or shrubs pine forests	3–20 feet	May through July; single brood.	Clutch incubated for 12–15 days by female; altricial young fledge at approximately 18 days.	75	30–75	15–30
Western (Pacific-slope and Cordilleran) Flycatcher	*Empidonax difficilis/occidentalis*	Cup nests in cavities or tree stumps or on ledges or crevices in woodlands and forests often in riparian areas.	0–30 feet	April through July; sometimes double brood.	Clutch incubated for 14–15 days by female; altricial young fledge at 15–18 days.	75	30–75	15–30
Black Phoebe	*Sayornis nigricans*	Cup nests of mud cemented to vertical structures, often under an overhang.	3–10 feet	March through June; double brood.	Clutch incubated for 15–18 days by female; altricial young fledge at approximately 21 days.	75	30–75	15–30
Say's Phoebe	*Sayornis saya*	Cup nests on ledges with overhang or under a bridge; nest not made of mud like black phoebe.	0–79 feet	March through June; double brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 14–18 days.	75	30–75	15–30
Ash-throated Flycatcher	*Myiarchus cinerascens*	Cavities in trees and other structures in open deciduous woodland.	2–70 feet	May through July; single brood.	Clutch incubated for approximately 15 days by female; altricial young fledge at 16–17 days.	50	15–50	10–15
Cassin's Kingbird	*Tyrannus vociferans*	Cup nests in trees in savannahs and other open habitats.	25–74 feet	April through June; double brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 14 days.	75	30–75	15–30
Western Kingbird	*Tyrannus verticalis*	Cup nests in trees and artificial structures (e.g., power poles) in variety of open habitats.	13–55 feet	April through June; double brood.	Clutch incubated for 12–14 days by both sexes; altricial young fledge at 13–19 days.	75	30–75	15–30

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Loggerhead Shrike	*Lanius ludovicianus*	Cup nests in dense shrubs near grasslands and other open habitats.	3–8 feet	February through June; two or three broods.	Clutch incubated for 14–16 days by female while male provisions her; altricial young fledge at 17–21 days.	75	30–75	15–30
Least Bell's Vireo	*Vireo bellii pusillus*	Cup nests in dense shrubs and small trees in dense riparian areas.	1–3 feet	April through August; double brood.	Clutch incubated for approximately 14 days by both sexes; altricial young fledge at 10–12 days.	500	CR	CR
Arizona Bell's Vireo	*Vireo bellii arizonae*	Cup nests in dense shrubs and small trees in dense riparian areas.	1–3 feet	April through August; double brood.	Clutch incubated for approximately 14 days by both sexes; altricial young fledge at 10–12 days.	500	CR	CR
Cassin's Vireo	*Vireo cassinii*	Cup nests in a trees or shrubs in oak or oak-coniferous or mixed riparian woodland.	5–35 feet	April through July; single brood.	Clutch incubated for approximately 15 days by both sexes; altricial young fledge at 13 days.	75	30–75	15–30
Hutton's Vireo	*Vireo huttoni*	Cup nests on a twig forks in oaks and other trees along streams and canyons.	3–45 feet	March thorugh June; single or double brood.	Clutch incubated for 14–16 days by both sexes; altricial young fledge at approximately 14 days.	75	30–75	15–30
Warbling Vireo	*Vireo gilvus*	Cut nests high in trees in mature oak woodlands and mixed deciduous forests.	20–60 feet	May through July; double brood.	Clutch incubated for 12–13 days by both sexes; altricial young fledge at approximately 14 days.	75	30–75	15–30
Gray Vireo	*Vireo vicinior*	Nests in thorn scrub or pinyon-juniper woodland, low in thorny or twiggy shrub or tree.	2–8 feet	Mid-April through mid-August	Clutch incubated 13-14 days by both sexes; altricial young fledge at 13-14 days.	75	30–75	15–30

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Gray Jay	*Perisoreus canadensis*	Cup nests in shrubs or trees in coniferous forests and sometimes oak woodlands.	5–30 feet	March through July; single brood.	Clutch is incubated for 16–18 days; altricial young fledge at approximately 15 days.	75	30–75	15–30
Steller's Jay	*Cyanocitta stelleri*	Cup nests in trees or shrubs in coniferous or mixed hardwood forests or other woodlands.	7–16 feet	April through June; likely single brood.	Clutch incubated for approximately 16 days by female while male provisions her; altricial young fledge at 18 days.	75	30–75	15–30
Western Scrub-jay	*Aphelocoma californica*	Platform nests in shrubs, trees, bushes or vine tangles in a wide variety of habitats, including oak woodlands, savannah, agricultural, and suburban.	2–50 feet	March through June; single brood.	Clutch incubated for 15–17 days by female while male provisions her; altricial young fledge at 18 days.	75	30–75	15–30
Pinyon Jay	*Gymnorhinus cyanocephalus*	Cup nests in trees in ponderosa-pine forest.	3–115 feet	Mid-March through late June; single brood.	Clutch incubated 17 days by female, male provisions female; altricial young fledge at 21–22 days.	75	30–75	15–30
Clark’s Nutcracker	*Nucifraga columbiana*	Cup nests in pines, junipers, and firs in mountain coniferous forests.	8–45 feet	February through August; single brood.	Clutch incubated for 16–18 days by both sexes; altricial young fledge at approximately 22 days.	75	30–75	15–30
Yellow-billed Magpie	*Pica nuttallii*	Platform nests in oak trees and occasionally other trees in savannah.	30–80 feet	February through July; single brood.	Clutch incubated for 16–18 days by female while male provisions her; altricial young fledge at approximately 30 days.	75	30–75	15–30

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American Crow	*Corvus brachyrhynchos*	Platform nests in variety of large trees, usually near the trunk, and artificial structures in a wide variety of habitats.	10–70 feet	February through July; single brood.	Clutch incubated for approximately 18 days by female and possibly helpers; altricial young fledge at 35 days.	50	30–50	15–30
Common Raven	*Corvus corax*	Platform nests on sheltered rock ledges or in forks of large trees and artificial structures in a wide variety of habitats.	45–80 feet	February through July; single brood.	Clutch incubated for 20–21 days by female while male provisions her; altricial young fledge at 35–42 days.	50	30–50	15–30
Western Bluebird	*Sialia mexicana*	Cavities in woodland clearings, savannahs, and other open habitats.	4–48 feet	April through June; double brood.	Clutch incubated for 13–14 days by female; altricial young fledge at approximately 20 days.	50	15–50	10–15
Townsend's Solitaire	*Myadestes townsendi*	Cup nests on ground usually on cutbanks and other slopes in mountain coniferous forests.	0–12 feet	April through June; single or double brood.	Clutch incubated for 11–14 days by female; altricial young fledge at 10–14 days.	75	30–75	15–30
Swainson's Thrush	*Catharus ustulatus*	Cup nests in dense shrubs, often in riparian woodlands and mixed coniferous forests.	2–20 feet	April through August; single or (rarely) double brood.	Clutch incubated for 10–13 days by female; altricial young fledge after 10–12 days.	75	30–75	15–30
Hermit Thrush	*Catharus guttatus*	Cup nests in dense shrubs variety of forests and woodlands.	2–10 feet	June through July; single or double brood.	Clutch incubated for 12–13 days by female; altricial young fledge at 12–13 days.	75	30–75	15–30
American Robin	*Turdus migratorius*	Cup nests in trees or shrubs, ledges of buildings, or in a tree forks in variety of open habitats.	3–25 feet	May through July; two or three broods.	Clutch incubated for 11–14 days by female; altricial young fledge at 14–16 days.	75	30–75	15–30

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Varied Thrush	*Ixoreus maevius*	Cup nests on horizontal branches of trees in moist coniferous forests.	5–20 feet	April through August; double brood.	Clutch incubated for approximately 14 days by female; altricial young fledge at 13–15 days.	75	30–75	15–30
Horned Lark	*Eremophila alpestris*	Scrapes in a small hollow usually sheltered by plant tufts in grasslands and other open habitats.	Ground	February through August; two or three broods.	Clutch incubated for 10–14 days by female; altricial young fledge at 9–12 days.	75	30–75	15–30
Purple Martin	*Progne subis*	Cavities in trees in mountain forests, particularly burned areas with snags.	10–34 feet	April through August; single brood	Clutch incubated for 15–18 days by the female; altricial young fledge at 24–31 days.	75	30–75	15–30
Tree Swallow	*Tachycineta bicolor*	Cavities in open habitats, such as grasslands or wetlands with dead standing trees; usually near water.	10–16 feet	April through August; double brood.	Clutch is incubated for 13–16 days; altricial young fledge at 16–20 days.	50	30–50	15–30
Violet-green Swallow	*Tachycineta thalassina*	Cavities or occasionally on cliffs or banks in deciduous, coniferous, and mixed woodlands.	9–17 feet	April through August; single brood.	Clutch is incubated for 13–15 days; altricial young fledge at 16–24 days.	50	30–50	15–30
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Cavities on a steep slope or use crevices and holes in bridges and buildings.	Ground/cliff	April through June; single brood.	Clutch incubated for 15–16 days by female; altricial young fledge at 18–21 days.	75	30–75	15–30
Bank Swallow	*Riparia riparia*	Cavities in sandy banks or cliffs along rivers.	Ground/cliff	May through July; single brood.	Clutch incubated for 12–16 days by both sexes; altricial young fledge at 18–24 days.	100	CR	CR

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Barn Swallow	*Hirundo rustica*	Cup nests often on buildings and bridges in open habitats near water.	6–40 feet	April through July; double brood.	Clutch incubated for 14–16 days by both sexes; altricial young fledge at 17–24 days.	50	30–50	15–30
Cliff Swallow	*Petrochelidon pyrrhonota*	Closed mud nests often on cliff faces, buildings, or bridges in open habitats near water.	5 feet and higher	April through June; double brood.	Clutch incubated for 12–14 days by both sexes; altricial young fledge at approximately 23 days.	50	30–50	15–30
Mountain Chickadee	*Poecile gambeli*	Cavities in trees in coniferous mountain forests.	16–50 feet	April through August; single or double brood.	Clutch is incubated for 14 days; altricial young fledge at 20 days.	50	15–50	10–15
Chestnut-backed Chickadee	*Poecile rufescens*	Cavities trees in coniferous forests and deciduous woodlands.	0–80 feet	March through July; single or (rarely) double brood.	Clutch is incubated for 12–14 days by female; altricial young fledge at 18–21 days.	50	15–50	10–15
Oak Titmouse	*Baeolophus inornatus*	Cavities in trees in oak woodlands.	2–40 feet	March through June; single brood.	Clutch incubated for 14–16 days by female; altricial young fledge at 17 days.	50	15–50	10–15
Bushtit	*Psaltriparus minimus*	Pendulous nests in trees and shrubs in a variety of habitats.	3–98 feet	February through June; double brood.	Clutch incubated for 12–13 days by both sexes; altricial young fledge at 14–15 days.	50	30–50	15–30
Red-breasted Nuthatch	*Sitta canadensis*	Cavities in trees in coniferous forests and mixed woodlands.	5–40 feet	April through July; single or (rarely) double brood.	Clutch incubated for approximately 12 days by female while male provisions her; altricial young fledge at 18–21 days.	75	30–75	15–30
White-breasted Nuthatch	*Sitta carolinensis*	Cavities in trees in deciduous woodlands and mixed coniferous forests.	1–50 feet	March through June; single brood.	Clutch incubated for 12–14 days by female while male provisions her; altricial young fledge at 14–16 days.	50	15–50	10–15

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Pygmy Nuthatch	*Sitta pygmaea*	Cavities in dead trees or dead portions of trees in long-needled pine forests.	20–70 feet	May through July; single or double brood.	Clutch incubated for 15–16 days by female while male provisions her; altricial young fledge at 20–21 days.	75	30–75	15–30
Brown Creeper	*Certhia americana*	Cup nests concealed behind loose bark, in crevices on a trees in coniferous forests and mixed coniferous forests..	5–15 feet	May through July; single brood.	Clutch incubated for 15–18 days by female while male provisions her; altricial young fledge at 21 days.	75	30–75	15–30
Rock Wren	*Salpinctes obsoletus*	Cavities on rocky slopes	Ground/cliff	March through June; double or triple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 14–16 days.	75	30–75	15–30
Canyon Wren	*Catherpes mexicanus*	Cup nests in rock crevices or ledges in rocy habitats.	Ground/cliff	March through July; double brood.	Clutch incubated for 12–18 days by female; altricial young fledge at approximately 15 days.	75	30–75	15–30
Bewick's Wren	*Thryomanes bewickii*	Cavities in trees, brush, or between rocks in open woodlands and shrubby areas.	0–20 feet	March through July; double or triple brood.	Clutch incubated for approximately 14 days by female while male provisions her; altricial young fledge at approximately 14 days.	75	30–75	15–30
House Wren	*Troglodytes aedon*	Cavities in shrubby cover and thickets in open woodlands and hedgerows.	0–20 feet	April through July; double brood.	Clutch incubated for 13–15 days by female; altricial young fledge at 12–18 days.	50	30–50	15–30
Pacific Wren	*Troglodytes pacificus*	Cavities or crevices in logs, stumps, root balls, or trees in variety of forests.	0–10 feet	March through August; single or double brood.	Clutch is incubated for 14–17 days by female; altricial young fledge at approximately 19 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Marsh Wren	*Cistothorus palustris*	Domed nests over the water in tall rushes and marsh grasses in wetland habitats.	1–5 feet	March through July; double or triple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 13–15 days.	75	30–75	15–30
American Dipper	*Cinclus mexicanus*	Domed nests in crevices in rocks, logs, bridges, or other protected areas immediately adjacent to water.	0–30 feet	March through August; single or double brood.	Clutch is incubated for approximately 16 days by female; altricial young fledge at 18–25 days.	75	30–75	15–30
Golden-crowned Kinglet	*Regulus satrapa*	Hanging nests woven onto conifer twigs in coniferous forests and mixed woodlands.	6–50 feet	May through August; single or double brood.	Clutch is incubated for 14–15 days by female; altricial young fledge at 16–19 days.	75	30–75	15–30
Ruby-crowned Kinglet	*Regulus calendula*	Cup nests in trees in coniferous woodlands.	4–100 feet	May through July; single brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 16 days.	75	30–75	15–30
Blue-gray Gnatcatcher	*Polioptila caerulea*	Cup nests in trees or shrubs in a variety of habitats from shrublands to mature forests.	3–80 feet	April through July; double brood.	Clutch incubated for approximately 15 days by both sexes; altricial young fledge at 12–13 days.	75	30–75	15–30
Coastal California Gnatcatcher	*Polioptila californica californica*	Cup nests in coastal sage scrub and chaparral.	2–3 feet	February through August; double brood.	Clutch incubated for approximately 14 days by both sexes; altricial young fledge at 15–16 days.	500	CR	CR
Wrentit	*Chamaea fasciata*	Cup nests in coastal sage scrub and chaparral.	1–4 feet	March through July; double brood.	Clutch incubated for 15–16 days by both sexes; altricial young fledge at 15–16 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Northern Mockingbird	*Mimus polyglottos*	Cup nests in shrubs and trees in variety of habitats, including woodlands and in developed areas.	3–10 feet	March through July; double or triple brood.	Clutch incubated for 11–14 days by female; altricial young fledge at 12–14 days.	75	30–75	15–30
Sage Thrasher	*Oreoscoptes montanus*	Cup nests in low shrubs in sagebrush habitat.	2–3 feet	April through August; single or double brood.	Clutch is incubated for 13–17 days; altricial young fledge at approximately 11 days.	75	30–75	15–30
Le Conte's Thrasher	*Toxostoma lecontei*	Cup nests in cholla or a low tree, in desert areas with shrubby growth.	2–8 feet	February through June; double or triple brood.	Clutch incubated for 14–20 days by both sexes; altricial young fledge at 14–17 days.	75	30–75	15–30
California Thrasher	*Toxostoma redivivum*	Cup nests in low trees or shrubs in sage scrub and chaparral.	2–4 feet	February through July; double brood.	Clutch incubated for approximately 14 days by both sexes; altricial young fledge at 12–14 days.	75	30–75	15–30
Bendire’s Thrasher	*Toxostoma bendirei*	Cup nests in shrubs, cacti, or trees.	2–5 feet	Late February through April; single, double, or triple brood.	Clutch incubated 12–14 days by both parents; altricial young fledge at 12–13 days.	75	30–75	15–30
Cedar Waxwing	*Bombycilla cedrorum*	Cup nests in forks of trees in riparian or redwood forests.	5–50 feet	June through August; single or double brood.	Clutch is incubated for 12–14 days; altricial young fledge at 16–18 days	75	30–75	15–30
Phainopepla	*Phainopepla nitens*	Cup nests in trees in desert scrub and coastal chaparral.	6–11 feet	Late February—desert; April through June—coastal; double brood.	Clutch incubated for 14–15 days by both sexes; altricial young fledge at 18–19 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Orange-crowned Warbler	*Oreothlypis celata*	Cup nests on the ground or in crevices near ground in a variety of habitats, often where woodland and chaparral habitats meet.	Ground	April through July; single or double brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 12–13 days.	75	30–75	15–30
Nashville Warbler	*Oreothlypis ruficapilla*	Cup nests on ground concealed in bushes or small trees in woodland edges or shrubby areas.	Ground	May through July; single brood.	Clutch incubated for 11–12 days by female; altricial young fledge at 11 days.	75	30–75	15–30
Yellow Warbler	*Setophaga petechia*	Cup nests in trees or shrubs in shrubby growth in riparian areas.	2–12 feet	April through July; single brood.	Clutch incubated for 11–12 days by female; altricial young fledge at days.	75	30–75	15–30
Yellow-rumped Warbler	*Setophaga coronata*	Cup nests in trees in coniferous woodlands.	4–50 feet	April through July; single or (rarely) double brood.	Clutch incubated for 12–13 days by female; altricial young fledge at 12–14 days.	75	30–75	15–30
Black-throated Gray Warbler	*Setophaga nigrescens*	Cup nests in trees or shrubs in open woodlands in mountainous areas.	8–35 feet	May through July; single or double brood.	Clutch incubated by female; young are altricial. Length of incubation period and age at fledging undocumented.	75	30–75	15–30
Hermit Warbler	*Setophaga occidentalis*	Cup nests high in trees in coniferous forests	20–40 feet	May through July; single brood.	Clutch incubated for approximately 12 days by both sexes; altricial young fledge at 8–10 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
MacGillivray's Warbler	*Geothlypis tolmiei*	Cup nests in low thick shrub in riparian woodlands and coniferous or mixed forests.	1–5 feet	May through July; single brood.	Clutch incubated for 11–13 days by female; altricial young fledge at 8–10 days.	75	30–75	15–30
Common Yellowthroat	*Geothlypis trichas*	Cup nests in reeds and other wetland vegetation over water or near water.	1–3 feet	April through July; single brood.	Clutch incubated for approximately 12 days by female; altricial young fledge at 9–10 days.	75	30–75	15–30
Wilson's Warbler	*Cardellina pusilla*	Cup nests on ground, hidden by vegetation in shrub habitats in forests and chaparral.	Ground	April through June; single or (rarely) double brood.	Clutch incubated for 11–13 days by female; altricial young fledge at 10–11 days.	75	30–75	15–30
Yellow-breasted Chat	*Icteria virens*	Cup nests in a dense shrub or tangle in thick riparian vegetation.	1–8 feet	April through July; single or (rarely) brood.	Clutch incubated for 11–12 days by female; altricial young fledge at 8–11 days.	75	30–75	15–30
Western Tanager	*Piranga ludoviciana*	Cup nests high in trees on outer branches in coniferous and mixed hardwood forests.	8–75 feet	May through July; single brood.	Clutch incubated for approximately 13 days by female; altricial young fledge at 10–11 days.	75	30–75	15–30
Green-tailed Towhee	*Pipilo chlorulus*	Cup nests in or at base of low shrubs in chaparral and disturbed (low growth) forest habitats.	0–2 feet	April through August; single or double brood.	Clutch incubated for 11–13 days by female; altricial young fledge at 11–14 days.	75	30–75	15–30
Spotted Towhee	*Pipilo maculatus*	Cup nests usually on the ground or very low in bushes shrubby habitats.	2–12 feet	April through July; single or double brood.	Clutch incubated for 12–13 days by female; altricial young fledge at approximately 9 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
California Towhee	*Melozone crissalis*	Cup nests in shrubs or small trees in brushy habitats.	4–12 feet	March through July; double or triple brood.	Clutch incubated for approximately 14 days by female; altricial young fledge at approximately 10 days.	75	30–75	15–30
Rufous-crowned Sparrow	*Aimophila ruficeps*	Cup nests at the base of a grass clumps, in dry rocky areas with sparse undergrowth.	0–2 feet	April through June; single or double brood.	Clutch incubated for 11–13 days by female; altricial young fledge at 9 days.	75	30–75	15–30
Chipping Sparrow	*Spizella passerina*	Cup nests in trees or shrubs in open woodlands.	3–20 feet	April through July; double brood.	Clutch incubated for 11–14 days by female; altricial young fledge at 9–12 days.	75	30–75	15–30
Black-chinned Sparrow	*Spizella atrogularis*	Cup nests in shrubs in chaparral habitat.	1–3 feet	April through August; single brood.	Clutch incubated for 12–13 days by female; altricial young fledge at approximately 10 days.	75	30–75	15–30
Lark Sparrow	*Chondestes grammacus*	Cup nests usually in scrapes on ground in open grasslands, or cup nests in herbaceous or woody shrubs.	0–9 feet	April through July; double brood.	Clutch incubated for 11–13 days by female; altricial young fledge at 9–10 days.	75	30–75	15–30
Black-throated Sparrow	*Amphispiza bilineata*	Cup nests in thorny shrubs or cactus in chaparral or desert habitats.	1 foot	April through June; single or double brood.	Clutch incubated for 12–13 days by female; altricial young fledge at approximately 9.5 days.	75	30–75	15–30
Sage Sparrow	*Artemisiospiza belli*	Cup nests in thick bushes in chaparral and desert habitats.	1 foot	March through June; double brood.	Clutch incubated for 10–16 days by female; altricial young fledge at 9–10 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Bryant's Savannah Sparrow	*Passerculus sandwichensis alaudinus*	Cup nests on ground in dense, moist grasslands, ruderal vegetation, or saltmarsh vegetation.	Ground	April through July; single or double brood.	Clutch incubated for 10–13 days; altricial young fledge at 7–14 days.	75	30–75	15–30
Belding's Savannah Sparrow	*Passerculus sandwichensis beldingi*	Cup nests on ground in dense, moist grasslands, ruderal vegetation, or saltmarsh vegetation.	Ground	April through July; single or double brood.	Clutch incubated for 10–13 days; altricial young fledge at 7–14 days.	75	CR	CR
Grasshopper Sparrow	*Ammodramus savannarum*	Ground nest at the base of bunchgrass or other vegetation in grasslands.	Ground	April through July; double or triple brood.	Clutch incubated for 11–12 days by female; altricial young fledge after 9 days.	75	30–75	15–30
Song Sparrow	*Melospiza melodia*	Cup nests in low grass and shrubs or thickets in a variety of forest, shrub, grassland, marsh, and riparian habitats.	1–3 feet	March through July; double, triple, or quadruple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 10 days.	75	30–75	15–30
Suisun Song Sparrow	*Melospiza melodia maxillaris*	Cup nests in low grass and shrubs or thickets in a variety of forest, shrub, grassland, marsh, and riparian habitats.	1–3 feet	March through July; double, triple, or quadruple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 10 days.	75	30–75	15–30
Alameda Song Sparrow	*Melospiza melodia pusillula*	Cup nests in low grass and shrubs or thickets in a variety of forest, shrub, grassland, marsh, and riparian habitats.	1–3 feet	March through July; double, triple, or quadruple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 10 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
San Pablo Song Sparrow	*Melospiza melodia samuelis*	Cup nests in low grass and shrubs or thickets in a variety of forest, shrub, grassland, marsh, and riparian habitats.	1–3 feet	March through July; double, triple, or quadruple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 10 days.	75	30–75	15–30
Lincoln's Sparrow	*Melospiza lincolnii*	Cup nests in depressions on the ground in shrubby growth at forest edges, clearings; often near wet areas	Ground	May through July; double brood.	Clutch incubated for 13–14 days by female; altricial young fledge at 10–12 days.	75	30–75	15–30
White-crowned Sparrow	*Zonotrichia leucophrys*	Cup nests on ground or in shrubs or small trees in coastal or mountain chaparral and mountain forests.	0–5 feet	May through September; double or triple brood.	Clutch incubated for 9–15 days; altricial young fledge at 9–11 days	50	30–50	15–30
Dark-eyed Junco	*Junco hyemalis*	Cup nests in depressions on the ground among tree roots or brush in variety of woodland habitats; also on building ledges or in trees.	Ground, but up to 8 feet on ledges or trees	April through July; double or triple brood.	Clutch incubated for 12–13 days by female; altricial young fledge at 10–13 days.	50	30–50	15–30
Black-headed Grosbeak	*Pheucticus melanocephalus*	Cup nests in trees or shrubs in thickets, under trees along streams in riparian woodlands or coniferous or mixed forests near edges.	6–12 feet	April through July; single brood.	Clutch incubated for 12–13 days by both sexes; altricial young fledge at 12 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Blue Grosbeak	*Guiraca caerulea*	Cup nests small trees, shrubs, or other low vegetation, usually near open areas in desert, chaparral, savannah, and forest edge habitats.	<1–16 feet	April through August; single or double brood.	Clutch incubated for 11–12 days by female; altricial young fledge at 9–13 days.	75	30–75	15–30
Lazuli Bunting	*Passerina amoena*	Cup nests in low thick shrubby riparian or chaparral habitat.	1–10 feet	May through July; double brood.	Clutch incubated for approximately 12 days by female; altricial young fledge at 10–15 days.	75	30–75	15–30
Red-winged Blackbird	*Agelaius phoeniceus*	Cup nests in cattails, bulrushes, and other marsh vegetation or in shrubs in grasslands and shrubby habitats.	1–13 feet	March through June; double brood.	Clutch incubated for 10–12 days by female; altricial young fledge at 10–11 days.	75 350 (Kern Red-winged Blackbird)	30–75 200–350 (Kern Red-winged Blackbird)	15–30 100–200 (Kern Red-winged Blackbird)
Tricolored Blackbird	*Agelaius tricolor*	Cup nests in cattails and bulrushes in marshes and shrubby areas in uplands and agricultural areas. Colonial nester.	1–5 feet	April through June; double brood.	Clutch incubated for approximately 11 days by female; altricial young fledge at 13 days.	350	CR	CR
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Cup nests cattails or other emergent vegetation over water in marshes with thick vegetative growth. Colonial nester.	2–3 feet	May through June; single brood.	Clutch incubated for 10–13 days by female; altricial young fledge at 9–12 days old	350	200–350	100–200
Brewer's Blackbird	*Euphagus cyanocephalus*	Cup nests high in trees or shrubs near water in agricultural or suburban/urban areas.	8–43 feet	March through July; single or double brood.	Clutch incubated for 12–13 days by female; altricial young fledge at approximately 13 days.	50	30–50	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Western Meadowlark	*Sturnella neglecta*	Domed nests on ground in open grasslands.	Ground	March through June; double brood.	Clutch incubated for 13–15 days by female; altricial young fledge at 10–12 days.	75	30–75	15–30
Hooded Oriole	*Icterus cucullatus*	Closed cup nests high in trees (often palm treets) or shrubs, often in riparian habitat and in suburban areas.	10–45 feet	April through August; double or triple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at approximately 14 days.	75	30–75	15–30
Bullock's Oriole	*Icterus bullockii*	Pensile cup nests in twig fork of trees in riparian and oak woodlands.	6–15 feet	April through July; single brood.	Clutch incubated for approximately 14 days by female; altricial young fledge at approximately 14 days.	75	30–75	15–30
Pine Grosbeak	*Pinicola enucleator*	Cup nests near the end of horizontal tree branches in coniferous forests.	16–35 feet	May through August; single brood.	Clutch incubated for 13–14 days by female; altricial young fledge at approximately 14 days.	75	30–75	15–30
Purple Finch	*Haemorhous purpureus*	Cup nests high in trees well hidden by foliage, in coniferous forests and woodlands.	5–60 feet	April through June; double brood.	Clutch incubated for approximately 13 days by female; altricial young fledge at approximately 14 days.	75	30–75	15–30
House Finch	*Haemorhous mexicanus*	Cup nests in trees, building ledges, and other locations in urban/suburban, agriculture, woodlands, desert, and chaparral habitats.	5–7 feet	March through July; double or triple brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 14–16 days.	50	15–30	10–15
Red Crossbill	*Loxia curvirostra*	Loose cup constructed near the end of horizontal branch in coniferous forests.	6–60 feet	February through June; single brood.	Clutch incubated for 12–16 days by female; altricial young fledge at 17–22 days.	75	30–75	15–30

Common Name	Scientific Name	Nest Location, Substrate, and Habitat	Vertical Height	Peak Breeding Season/Number of Broods per Season	Incubation Duration/Chick-rearing Duration	Standard Buffer* (feet)	Medium to High Disturbance Category Buffer (feet)	Low to Medium Disturbance Category Buffer (feet)
Pine Siskin	*Spinus pinus*	Cup nest constructed on conifer or hardwood in coniferous or mixed hardwood forests.	3–50 feet	April through July; single or double brood.	Clutch incubated for approximately 13 days; altricial young fledge at 14–15 days.	75	30–75	15–30
Lesser Goldfinch	*Spinus psaltria*	Cup nests in trees and shrubs in a variety of open habitats including oak woodlands, mixed coniferous forests, riparian woodlands, chaparral, agricultural and suburban habitats.	3–36 feet	April through July; single or double brood.	Clutch incubated for approximately 12 days by female; altricial young fledge at 11 days.	75	30–75	15–30
Lawrence's Goldfinch	*Spinus lawrencei*	Cup nests in scattered trees in oak woodlands and savannahs.	3–40 feet	April through July; single or (rarely) double brood	Clutch incubated for 12–13 days by female; altricial young fledge at approximately 11 days.	75	30–75	15–30
American Goldfinch	*Spinus tristis*	Cup nests in a variety of shrubs in variety of open habitats including ruderal fields and grasslands with shrub component nearby.	3–10 feet	April through August; single or double brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 11–17 days.	75	30–75	15–30
Evening Grosbeak	*Coccothraustes vespertinus*	Cup nests in fir or other conifers in coniferous forests.	30–60 feet	June through August; single or (rarely) double brood.	Clutch incubated for 12–14 days by female; altricial young fledge at 13–14 days.	75	30–75	15–30

[a] Consultation recommended to perform work within the standard buffer. Confer internally on avoidance and minimization approach.

[b] The 1,320-foot (0.25-mile) buffer applies to the highest noise level category (90 dB or greater measured at 50 feet). Smaller buffers may be appropriate based on the noise levels of the project. Biologists should follow the methodology found in *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (U.S. Fish and Wildlife Service 2006) to determine the noise level and appropriate buffer for their specific project.

Appendix D1
Architectural Identification and Evaluation Report

Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California

Architectural Identification and Evaluation Report

Final

March 2023

Pacific Gas & Electric Company

Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California

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Client Name:	Pacific Gas and Electric Company
Project Manager:	Colleen Taylor
Author:	Amanda Reese, Kelly Morgan, Marcia Montgomery, and Jeremy Hollins

Jacobs Engineering Group Inc.

Executive Summary

Pacific Gas and Electric Company (PG&E) proposes the Northern San Joaquin 230 kV Transmission Project (Project) in San Joaquin County, California (Appendix A, Figure 1). The Project includes construction of a new 230 kilovolt (kV) transmission line that will connect the existing PG&E Brighton-Bellota 230 kV transmission line through PG&E Lockeford Substation with Lodi Electric Utility (LEU) Industrial Substation. Three existing PG&E 60 kV lines connecting into LEU Industrial Substation will be removed to accommodate the new PG&E transmission line or will be reconfigured in their existing alignments. A new PG&E switching station near LEU Industrial Substation also is proposed as part of the Project.

Jacobs Engineering Group, Inc. developed this report to present the results of the identification and evaluation of architectural resources in the Area of Potential Impacts (API) for the Project. The report also assesses the potential impacts that may occur to the resources evaluated as eligible for listing in the California Register of Historical Resources (CRHR) and considered historical resources for the purposes of the California Environmental Quality Act (CEQA). The report was completed in compliance with Sections 21083.2 to 21084.1 of the Public Resources Code and with the California Code of Regulations and CEQA Guidelines, Title 14, Chapter 3, Sections 15000 to 15387. Notably, this report does not address archaeology. Refer to the companion to this report, *Cultural Resources Inventory Report for the PG&E Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California*, completed by Far Western Anthropological Research Group, Inc. (Far Western), for information on archaeological investigations for the Project.

The API for the Project encompasses 3,662 acres (Appendix A, Figure 2). It includes the maximum Project footprint and all areas related to the Project's construction, implementation, and operation, including areas anticipated to be used as access roads, staging areas, and laydown areas. In addition, the API accounts for potential visual, atmospheric, and audible impacts. The API includes a 500-foot-radius past the Project footprint in rural areas and one parcel past the Project footprint in suburban and industrial areas when Project improvements include the new transmission line or switching station or substation improvements due to the highly visible nature of these features. The vertical extent of the API will not exceed 155 feet above the existing ground surface for the new transmission line poles and 30 feet above the existing ground surface for the switching station and substation improvements. Representative photographs of the API are included in Appendix B.

As part of the archaeology companion to this report, Far Western conducted a records search in 2021 to identify previously recorded cultural resources (consisting of archaeological and architectural resources) and previously conducted cultural resources investigations within the Project footprint and a 0.25-mile-radius study area surrounding the API. The results of the records search indicated that one architectural resource investigation has been previously conducted within the 0.25-mile-radius study area (Report Number SJ-04506), and that it covered less than 1 percent of the API (Appendix A, Figure 3). Additionally, the records search identified three previously recorded architectural resources within the 0.25-mile-radius study area: California Department of Transportation (Caltrans) Bridge Number 29C-341, which carries East Harney Lane over Paddy Creek, as well as the Southern Pacific Railroad (SPRR) (Primary Number P-39-000002) and Central California Traction Railroad (CCTR) (Primary Number P-39-004457) that intersect the API (Appendix A, Figure 3). The bridge is located immediately south of the API, and has been assigned National Register of Historic Places (NRHP) Status Code 5 by Caltrans, signifying it is not eligible for listing in the NRHP. A small segment of the SPRR within the API is previously recorded based on mapping in the PG&E MapGuide Database cultural layer. However, based on review of past recordation forms for the SPRR as well as historic maps and aerials, the line did not extend through the API. Rather, the geographic information system shape of the previously recorded segment of the SPRR within the API in the MapGuide Database cultural layer appears to be an error. The segment of the CCTR within the API is newly identified. Previously recorded segments of the CCTR either are unevaluated or have been recommend not eligible for listing in the NRHP and CRHR. Prior to fieldwork, a historic context was developed to facilitate identification and evaluation efforts as part of this report. The historic context was based on records search information and primary and secondary sources available at repositories and online sources. Investigators also reviewed information from the San Joaquin County Assessor and ParcelQuest to identify the age of the resources in the API and determine the date of any major additions or alterations (Appendix A, Figure 4).

An architectural field survey of the entire API was conducted between December 15 and 22, 2022. The survey was conducted from public vantage points and public rights-of-way. If surveyed resources were not visible or accessible from public areas, investigators completed supplemental research to record and evaluate the resources, such as review of current mapping software, historic maps, aerials, historic newspaper databases, city directories, and other sources.

During the survey, investigators took geotagged photographs of each architectural resource constructed on or before the survey cutoff date of 1977, including any accessory resources, and took notes on architectural style, form, condition, and historic integrity. In addition, investigators completed desktop reviews of two Project alternatives (Northern Alternative and Central Alternative) to characterize the general setting, identify common architectural styles and property types, understand construction chronologies, and note alterations and additions to larger properties and individual buildings and structures.

The extent of the API was also field verified to determine if the Project would be visible past the 500-foot-radius buffer surrounding the new transmission line. In several instances, the API was expanded to include the full extent of a parcel and other interrelated properties based on existing conditions, such as flat topography, limited development, and lack of other visual intrusions. Oftentimes, a building cluster would be located immediately outside the API limits; however, since the building cluster was associated with properties within the API, it was recorded as part of an interrelated resource, including the portion outside the API. For example, residences and outbuildings were frequently outside the limits of the API; however, since they were directly and historically associated with agricultural fields and orchards within the API, the entirety of the property was recorded and the API was expanded.

Resources meeting the 1977 survey cutoff date were documented on a survey results matrix included in Appendix C and recorded and evaluated on Department of Parks and Recreation (DPR) 523 series forms included in Appendix D. No resources constructed after the 1977 survey cutoff date appeared to possess exceptional significance; therefore, none of these resources were recorded. In areas where the new transmission line will be constructed alongside an existing transmission line with structures of a similar height as the proposed features, investigators confirmed in the field that no new visual intrusions would occur to properties within the API. This was completed through assessing existing viewsheds from public vantage points, the historic character and setting of the area, building orientation, existing vegetation, topography, and age of existing visual intrusions. If this assessment determined there would be no visual changes from the new line, the resources within the API were not recorded or evaluated as part of this report. Representative photographs of where there would be no visual changes from the new line are included in Appendix B, Photographs 17 through 22.

In total, the API has 188 parcels, 95 of which were constructed prior to 1977. Of these, 68 resources were recorded and evaluated as part of this report (refer to the survey results matrix in Appendix C and DPR 523 series forms in Appendix D). Of these, 67 resources are newly identified and one is a previously unrecorded segment of the CCTR (P-39-004457) within the API. Of the 68 resources, 7 are evaluated as eligible for listing in the CRHR and, therefore, meet the definition of a historical resource for purposes of CEQA for this Project. The recorded resources are mapped in Appendix A, Figure 5. Notably, the survey did not identify any evidence of the previously recorded segment of the SPRR within the API. One resource

(Resource Identifier 62; 13589 East Kettleman Road) was discovered to post-date the 1977 survey cutoff date during post-field research and, therefore, was not recorded or evaluated as part of this report.

No significant impacts will occur to the 7 resources evaluated as eligible for listing in the CRHR. There would be no physical impacts to these resources; therefore, the resources would retain their integrity of location, design, materials, workmanship, feeling, and association. The historic and current uses of these resources would remain intact (e.g., rural residential properties, some of which are engaged in small-scale agriculture on medium sized parcels). In addition, the character-defining features associated with each resource, such as their massing, materials, orientation, and landscape features, would remain intact and would not be diminished by the Project improvements. In most cases, the Project improvements will range from approximately 350 feet to approximately 1,100 feet from contributing resources within the property. Therefore, the resources would continue to convey their significance under their applicable CRHR criteria, such as Criterion 1 for representing early-twentieth century rural residential settlement or Criterion 3 for embodying a distinctive design. While the new transmission line may be visible from certain public vantage points, impacts from Project improvements would be marginal because changes have already impacted the integrity of setting and feeling of those areas. Therefore, a finding of a "Less than Significant Impact to Historical Resources" is recommended for the Project, in accordance with CEQA Guidelines, Appendix G, and Section 21084.1.

A copy of this report will be filed with the Central California Information Center of the California Historical Resources Information System.

Contents

Acronyms and Abbreviations

API	Area of Potential Impacts
APN	assessor's parcel number
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CCTR	Central California Traction Railroad
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
EBMUD	East Bay Municipal Utility District
Far Western	Far Western Anthropological Research Group, Inc.
Jacobs	Jacobs Engineering Group Inc.
kV	kilovolt
NAHC	Native American Heritage Commission
NPS	National Park Service
NRHP	National Register of Historic Places
NSJWCD	North San Joaquin Water Conservation District
PG&E	Pacific Gas and Electric Company
PRC	Public Resources Code
Project	Northern San Joaquin 230 kV Transmission Project
SJ&SNR	San Joaquin and Sierra Nevada Railroad
SLF	Sacred Lands File
SPRR	Southern Pacific Railroad
SR	State Route
U.S.	United States
UPRR	Union Pacific Railroad
USGS	U.S. Geological Survey

1. Introduction

Pacific Gas and Electric Company (PG&E) proposes the Northern San Joaquin 230 kV Transmission Project (Project) in San Joaquin County, California. The Project is located east of Highway 99, within and east of the City of Lodi (Appendix A, Figure 1).

Jacobs Engineering Group, Inc. (Jacobs) developed this report to present the results of the identification and evaluation of architectural resources in the Area of Potential Impacts (API) for the Project. The report also assesses the potential impacts that may occur to the resources evaluated as eligible for listing in the California Register of Historical Resources (CRHR) and considered historical resources for the purposes of the California Environmental Quality Act (CEQA). Notably, this report does not address archaeology. Refer to the companion to this report, *Cultural Resources Inventory Report for the PG&E Northern San Joaquin 230 kV Transmission Project, San Joaquin County, California*, completed by Far Western Anthropological Research Group, Inc. (Far Western), for information on archaeological investigations completed as part of the Project.

1.1 Project Description

The Project includes construction of a new 230 kilovolt (kV) transmission line that will connect the existing Brighton-Bellota 230 kV transmission line through PG&E Lockeford Substation with Lodi Electric Utility (LEU) Industrial Substation. Three existing PG&E 60 kV lines connecting into LEU Industrial Substation will be removed to accommodate the new PG&E transmission line or will be reconfigured in their existing alignments. A new PG&E switching station near LEU Industrial Substation also is proposed as part of the Project.

1.2 Area of Potential Impacts

For the purposes of this report and to analyze the Project's potential impacts to architectural resources, an API was established for the preferred alignment. The API comprises 3,662 acres (Appendix A, Figure 2). It encompasses the maximum Project footprint and all areas related to the Project's construction, implementation, and operation, including areas anticipated to be used as access roads, staging areas, and laydown areas.

In addition, the API accounts for potential visual, atmospheric, and audible impacts. The API includes a 500-foot radius past the Project footprint in rural areas and one parcel past the Project footprint in suburban and industrial areas when Project improvements include the new transmission line or switching station or substation improvements because of the highly visible nature of these features. The vertical extent of the API will not exceed 155 feet above the existing ground surface for the new transmission line poles and 30 feet above the existing ground surface for the switching station and substation improvements. Representative photographs of the API are included in Appendix B.

1.3 Regulatory Framework

This report was completed pursuant to Sections 21083.2 to 21084.1 of the Public Resources Code and with the California Code of Regulations and CEQA Guidelines Title 14, Chapter 3, Sections 15000 to 15387.

According to the CEQA Guidelines Appendix G, impacts on cultural resources would be considered significant if the Project would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Disturb any human remains, including those interred outside of formal cemeteries.

A historical resource is a cultural resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR). Historical resources, as defined in subdivision (k) of Section 4020.1, and included as such in a local register, or deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, are presumed to be historically or culturally significant, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the CRHR, not included in a local register, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1, does not preclude a lead agency from determining whether the resource may be a historical resource.

Pursuant to Section 15064.5, a cultural resource is considered to be historically significant if it meets the criteria for listing in the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4852) including the following:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States (U.S.); or
2. Associated with the lives of persons important to local, California, or national history; or
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 has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Historic integrity is the ability of a property to convey its significance and is defined as the authenticity of a resource's historic identity, evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity must be evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

CEQA Guidelines also define the significance of impacts to archaeological and historical resources as:

- Substantial adverse change in the significance of a historical resource by physical demolition, destruction, relocation, or alteration of the resource of its immediate surroundings as defined in Section 15064.5.
- Demolishes or materially alters those physical characteristics of a historical resource that conveys its significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR, or inclusion in a local register, as defined in Section 15064.5.

1.4 Project Personnel

This report was completed by Amanda Reese, M.A., Marcia Montgomery, M.A., and Kelly N. Morgan, M.P.S., all Architectural Historians at Jacobs. Ms. Morgan authored Sections 1, 2, and 3. Ms. Montgomery provided assistance with Section 3. Ms. Reese authored the remaining sections. Jeremy Hollins, M.A., Senior Architectural Historian at Jacobs, provided project direction, including oversight of the architectural field survey of the API, and completed a technical review of the report. Ms. Reese, Ms. Morgan, Ms.

Montgomery, and Mr. Hollins meet the Secretary of the Interior's Professional Qualification Standards in Architectural History and History.

2. Background Research

2.1 Records Search

As part of the archaeology companion to this report, Far Western conducted a review of the PG&E MapGuide Database cultural layer in 2021 to identify previously recorded cultural resources and previously conducted cultural resources investigations within the Project footprint and a 0.25-mile-radius study area. The records search completed by Far Western included both archaeological and architectural resources. The cultural layer includes all current files from the Central California Information Center of the California Historical Resources Information System. In addition, Far Western and Jacobs also examined the National Register of Historic Places (NRHP), CRHR, California Inventory of Historic Resources, California Points of Historic Interest, and California Historical Landmarks records as well as the Historic Properties Directory for resources in the API and study area.

The records search indicated that one architectural resource investigation has been previously conducted within the 0.25-mile-radius study area, covering approximately 1 percent of the northwest end of the API (Appendix A, Figure 3). URS Corporation conducted the investigation as part of the proposed Lodi Energy Center Project in 2001. No architectural resources were recorded as a result of the survey. The resultant report, *Lodi Energy Center Cultural Resources (Archaeological and Historic Built Environment Resources) Technical Report* (Report Number SJ-04506), was submitted to the City of Lodi in 2001. The records search also revealed that two regional overviews and two literature search reports cover parts of the API; however, these reports do not include surveys and are not mapped in Appendix A, Figure 3.

The records search identified three previously recorded architectural resources within the 0.25-mile-radius study area, consisting of two railroads that intersect the API and a bridge located 14 feet from the API. Table 2-1 lists these resources, which are mapped in Appendix A, Figure 3. The two railroads within the API are discussed further after the table.

Table 2-1. Previously Recorded Cultural Resources within the API and 0.5-Mile-Radius Study Area

Resource Name; Primary Number	Description	Recorder(s); Date	Eligibility
*Southern Pacific Railroad (SPRR); P-39-000002	The former SPRR alignment in San Joaquin. SPRR operation began in 1869, connecting the San Joaquin Valley with Sacramento and the transcontinental mainline. The alignment currently forms part of the present-day Union Pacific Railroad (UPRR).	Wisely, J.; 2018 Ford, Dawn Ramsey; 2012 Pappas, S., D. Quivey, and K. Tipper; 2011 Rainka, Greg; 2010 Martinez, Jesse; 2008 Jones, E. Timothy; 2006 M.R. Bowen; 2005 Jones & Stokes, 2004 Schmidt, M., C. Baker, and J. Dougherty; 2003 JRP Historical Consulting Services; 2003 Jon L. Brady 2003 Dolan, Christy, and Angel Tomes; 2002 Gross, Charlane; 2002 Byrd, David S.; 2002 Reno, R.; 2002 Windmiller, Ric; 2002 Bakic, Tracy and Cindy Baker; 2001 Egherman, R.; 2001 Egherman, R.; 2001	Previously recorded segments are unevaluated or recommended as not eligible for listing in the NRHP or CRHR. A short segment of the SPRR within the API was previously recorded based on the PG&E MapGuide Database cultural layer; however, documentation of this recordation was not located, and its GIS shape in the cultural layer appears to be an error. Refer to Section 2.1.1 for additional information.

Resource Name; Primary Number	Description	Recorder(s); Date	Eligibility
		Dore, Christopher, and W.L. Norton; 1997 Caesar, Clarence; 1995 Unknown; 1994 JRP Historical Consulting Services; 1994 JRP Historical Consulting Services; 1994 JRP Historical Consulting Services; 1994 JRP Historical Consulting Services; 1993 Costello, J. and J. Marvin; 1993	
*Central California Traction Railroad (CCTR); P-39-004457	The CCTR alignment in San Joaquin Valley. The railroad was constructed from Sacramento to Stockton between 1907 and 1910.	JRP Historical Consulting Services; 2003 Martinez; 2008 PARUS Consulting, Inc.; 2010 Pappas and Tippet; 2011	Previously recorded segments are unevaluated or are recommended as not eligible for listing in the NRHP or CRHR. The segment within the API is previously unrecorded and unevaluated.
California Department of Transportation (Caltrans) Bridge Number 29C-341; N/A	Bridge carrying East Harney Lane over Paddy Creek outside Lodi, constructed in 1964.	Caltrans; 2019	Assigned NRHP Status Code 5 by Caltrans, signifying not eligible for listing in the NRHP.
*Asterisk denotes that the resource is located within the API			

2.1.1 Southern Pacific Railroad (P-39-000002)

Segments of the SPRR in San Joaquin County have been recorded on multiple occasions. These previously recorded segments either have not been previously evaluated or were recommended as not eligible for listing in the NRHP (Dolan and Tomes 2002; Gross 2002).

According to the PG&E MapGuide Database cultural layer, a short segment of the SPRR within the API has been previously recorded. The GIS shapefile shows the segment located on both sides of the CCTR along East Sargent Road, between State Route (SR) 12 and Lodi Junction, and designates it as EBMUD-23. The resource appears in the location map included in a site record completed by Jones & Stokes in 1997. However, EBMUD-23 is not the subject of that record, which instead records two short SPRR segments outside the API, both of which are designated as EBMUD-10. Therefore, EBMUD-23's inclusion in the location map in that site record appears to be an error. The GIS shape for EBMUD-23 in the MapGuide Database cultural layer points to a segment called MR #6; however, MR #6 was recorded by Jones & Stokes in 2002 and is located southwest of Stockton (outside the API). Therefore, it appears that the GIS shape in the MapGuide Database cultural layer is an error. Based on review of historic topographic quadrangles dating back to 1909, the SPRR did not extend through the API. Rather, the SPRR mainline extended in a north-south orientation through Lodi approximately 0.82 mile west of the API. The SPRR Valley Spring Branch followed the alignment of present-day SR 12 approximately 0.26 mile north of the API.

2.1.2 Central California Traction Railroad (P-39-004457)

In 2003, JRP Historical Consulting Services recorded a 100-foot-long segment of the CCTR at the railroad's intersection with SR 12, approximately 250 feet north of the API. The segment was not evaluated for listing in the NRHP or CRHR; however, the record noted that the rails, ties, and crossing guards all appeared to be non-original and recently replaced. Three additional segments of the CCTR have since been recorded in Stockton (outside the API and 0.25-mile-radius study area). The first, in 2008, recommended the segment not eligible for listing in the NRHP and CRH due to a lack of integrity. The remaining two segments were recorded in 2010 and 2011 and are unevaluated.

2.2 Summary of Other Sources

Jacobs conducted additional background research to identify architectural resources within the API and develop a historic context. This included review of primary and secondary sources available at repositories and online, such as maps, aerials, regional histories, and historic newspaper. Statewide historic contexts pertinent to the API also were reviewed. These sources included the following:

- California Department of Transportation (Caltrans) publications consisting of:
  - *Water Conveyance Systems in California, Historic Context Development and Evaluation Procedures* (JRP Historical Consulting Services and Caltrans 2000)
  - *A Historical Context and Archaeological Research Design for Agricultural Properties in California* (Caltrans 2007)
  - *Caltrans Guidelines for Identifying and Evaluating Historic Landscapes* (Caltrans 1999)
- *A Model for Identifying and Evaluating the Historic Significance of Post–World War II Housing* (Transportation Research Board 2012)
- San Joaquin County libraries
- Lodi Historical Society
- San Joaquin County Historical Museum
- San Joaquin Delta College Library Archives and Special Collections
- National Park Service
- Ancestry.com
- ChroniclingAmerica.loc.gov (Library of Congress historic newspaper database)
- General Land Office land records
- HistoricAerials.com (NETROnline 2022)
- National Archives
- Newspapers.com
- NewspaperArchive.com
- National Register Focus Database
- ParcelQuest

- Sanborn Fire Insurance Maps
- U.S. Census records
- U.S. Geological Survey (USGS) topographic maps

2.3 Desktop Review of Alternatives

The Project has two other alternatives, the Northern Alternative and the Central Alternative, both located north of the preferred alignment. The alternatives are depicted in Appendix A, Figure 1. A records search for these areas was completed as part of the *Cultural Resources Constraints Report: Northern San Joaquin 230 kV Transmission Project* (Far Western 2020).

Jacobs reviewed this data to help characterize the resources located along the alternative alignments, develop a historic context, and to understand property types and periods of development for the API environs. This research was augmented by a desktop review completed using Google Earth, Google Street View, historic aerials, and USGS topographic maps. The following provides more information about the alternatives. Photographs depicting these areas are included in Appendix B.

- Northern Alternative
  - The Northern Alternative from LEU Industrial Substation until Curry Avenue is mainly industrial buildings consisting of warehouses, small offices and small factories, constructed from the 1950s through the present. From Curry Avenue eastward the properties are mainly small to midsize rural residential properties with residences, barns, shops, and garages. As the Northern Alternative runs across SR 88 parcel sizes become more irregularly sized and include agricultural lots with farm buildings, some rural residential, and some vacant lots solely used for agriculture. Most rural residential is situated to face county roads with setbacks varying from 10 to 50 feet.
  - At the western end of the Northern Alternative the built environment is characterized by modern industrial buildings and industrial buildings dating from 1950 through 1977. The industrial environment is characterized by warehouses and small offices (Appendix B, Photograph 1). Once the alternative crosses the CCTR tracks, the built environment is mainly rural residential, agricultural (vacant) land, and farm buildings (Appendix B, Photograph 2, 3). Most appear to date from 1920 through1970, with a fair degree of infill of modern properties. Most rural residences have replaced building elements, such as windows and siding, and are concentrated near rural roadways.
- Central Alternative
  - The Central Alternative from LEU Industrial Substation until Curry Avenue is mainly industrial buildings consisting of warehouses, small offices and small factories constructed from the 1950s through the present. From Curry Avenue eastward the properties are mainly small to midsize rural residential properties with residences, barns, shops, and garages. As the Central Alternative runs across SR 88, parcel sizes become more irregularly sized and include agricultural lots with farm buildings, some rural residential, and some vacant lots solely used for agriculture. Most rural residential is situated to face county roads with setbacks varying from 10 to 50 feet.
  - At the western end of the Central Alternative, the built environment is characterized by modern industrial buildings and industrial buildings dating from 1950 to 1977. The

industrial environment is characterized by warehouses and small offices (Appendix B, Photograph 4). Once the alternative crosses the CCTR tracks, the built environment is mainly rural residential, agricultural (vacant) land, and farm buildings (Appendix B, Photograph 5, 6). Most appear to date from 1920 to 1970, with a fair degree of infill of modern properties. Most rural residences have replaced building elements, such as windows and siding, and are concentrated near rural roadways.

3. Historic Context

In California, the historic period is generally divided into three periods: the Spanish Period (1769 to 1834), the Mexican Period (1821 to 1848), and the American Period (1848 to the present).

3.1 Spanish and Mexican Periods (1769 to 1848)

The Spanish Period spans 1769 to 1821, beginning with the founding of the El Presidio Real de San Diego and the Mission San Diego de Alcala. As early as 1776, the first formal European expedition, led by Lieutenant-Colonel Juan Bautista de Anza, entered San Joaquin Valley (Schenck 1926). Although the Spanish established a vast network of missions along the California coast during the Spanish Period, none of the missions were sited inland within San Joaquin County. A review of Spanish land grant information did not find any information regarding land grants within present-day San Joaquin County that might have relevance to the API's history (State Lands Commission 1982).

Mexico became independent of Spain in 1821, effectively ending the Spanish Period in California. Former Spanish lands were then opened for grants by the Mexican government to citizens who would colonize the area and use the land (Lech 2004). A review of Mexican land grant documented six land grants within San Joaquin County during the Mexican Period; however, none of these ranchos extended into the API (State Lands Commission 1982).

3.2 American Period (1848 to the Present)

Following the signing of the Treaty of Guadalupe Hidalgo in 1848, the U.S. took possession of what is now California. The discovery of gold in California in 1848 led to the start of the California Gold Rush the following year, bringing many speculators from the eastern U.S. and European countries to California. In 1850, California was admitted into the U.S. as the 31st state, primarily because of the population increase created by the Gold Rush.

San Joaquin County was formed when California achieved statehood in 1850. Cartographic review indicates the API environs remained sparsely populated during this time. Lodi later was established on the west end of the API in 1869 along the newly-constructed SPRR. The ease of transportation afforded by the SPRR and subsequent railroads coupled with an expanding road network contributed to the API environs' burgeoning agricultural industry during the second half of the nineteenth century. The area also benefited from its proximity to Stockton, a major trade center in the region.

Historic themes specific to the API include agriculture; irrigation, flood control, and water conveyance, transportation; and power infrastructure. These themes are discussed in greater detail below.

3.2.1 Agriculture

The earliest maps of the API date from 1856 and 1857 (General Land Office 1855, 1865). They show some roads extending through the area (discussed further in Section 3.2.3), but that the API was otherwise largely undeveloped. Lodi was created as a new railroad town at the west end of the API in 1869, and by 1890 grew to a population of approximately 1,200 residents (No author 1890). Around this time, a local history described that "The land in the vicinity [of Lodi] is sandy and excellent for almost all kinds of crops. Watermelons have been a great specialty here for many years" (No author 1890). However, dry grains principally were farmed in San Joaquin County during the 1800s. In the Lodi area, alfalfa was identified as "King of Crops" (Martin 1904:22). Therefore, it is likely that nineteenth-century farmers in the API produced dry grains such as alfalfa, which required little in the way of irrigation (Caltrans 2007).

During the early twentieth century, farmers in San Joaquin County increasingly began to diversify their crops, with the area surrounding Lodi becoming known for its wine grapes. Other farm goods in the area included olives, peaches, apricots, prunes, almonds, and figs, among others. Lodi thus featured six fruit packing sheds by 1906. Agricultural products grown in the API environs were shipped throughout California and the nation via the railroads that traversed the area. Orchards and vineyards continue to characterize the API to this day, reflecting the importance of the local agricultural industry (Martin 1904; No author 1890).

3.2.2 Irrigation, Flood Control, and Water Conveyance

Dry grain farming, the principal industry in San Joaquin County during the second half of the nineteenth century, required little in the way of irrigation. However, crop diversification occurred during the twentieth century that required the construction of more irrigation features. Natural waterways and canals served as lifelines providing water to farms via features such as smaller canals, laterals, and ditches (JRP Historical Consulting Services and Caltrans 2000). Historic maps and aerials show numerous wells in the API environs, as well as what appear to be small ditches diverting water from creeks to agricultural fields (NETROnline 2022; USGS 2022). This includes the Bear and Paddy creeks, which intersect the center of the API. A 1908 topographic quadrangle, the earliest available for the area, shows their meandering courses extending through the API immediately east of present-day SR 88. This also is reflected in subsequent quadrangles and aerials through 1961. By 1967, however, an aerial shows that all three creeks had been channelized to follow their current, straighter paths. According to a 1977 report by the U.S. Army Corps of Engineers, channelization of Bear Creek in San Joaquin County was completed between 1963 and 1967 as part of a flood protection project that built 24 miles of channel improvements and 41 miles of low levees along the waterway. The project was intended to protect agricultural land, suburban areas, and transportation corridors from the devastating effects of floods (U.S. Army Corps of Engineers 1977). Paddy Creek likely was channelized during the same period for flood protection purposes.

The entire API falls within the North San Joaquin Water Conservation District (NSJWCD), which was formed in 1948 to provide groundwater management (NSJWCD 2022). It represents one of the water storage and conservation districts created in California after the late 1920s in response to the "increased demand for storage and coordination of interest on larger streams" (JRP Historical Consulting and Caltrans 2000:15). The NSJWCD currently encompasses 150,000 acres east of Lodi on both sides of the Mokelumne River and includes features such as pump stations, recharge sites, and reservoirs for water storage (all outside the API). A 2020 map of the district identifies that the NSJWCD South Pipeline, which delivers water from Mokelumne River to the north into Pixley Slough and Bear Creek to the south, intersects the API approximately 0.5 mile east of North Alpine Road (NSJWCD 2020). The pipeline also is used during irrigation season to convey water to farms (Greater San Joaquin County Regional Water Coordinating Committee 2020). The pipeline's north-south alignment through the API first appears between 1961 and 1968 topographic quadrangles, where it is labeled an aqueduct (NETROnline 2022; USGS 2022).

3.2.2.1 Mokelumne Aqueduct

Another aqueduct intersects the API: the Mokelumne Aqueduct, which extends northeast-southwest through the extreme east end of the API. The resource runs nearly 100 miles in total and is owned and operated by the East Bay Municipal Utility District (EBMUD). The first segment of the line was completed in the 1920 to provide water to the rapidly growing East Bay area. Additional segments were added as the twentieth century progressed (EBMUD 2022). The aqueduct is first depicted through the API between the 1942 and 1947 topographical quadrangles (USGS 2022).

Based on the *Water Conveyance Systems in California* statewide historic context, California's growing metropolitan areas needed increased water supplies in the early twentieth century. Cities adopted the concept of interbasin water transfer, pulling water from outside the local county around this time. The context describes, "First, Los Angeles in the Owens Valley (1906-1913), followed by San Francisco at Hetch Hetchy (1913-1935) and Oakland on the Mokelumne River (1924-1928), the state's major urban areas reached beyond their local and increasingly inadequate watershed to secure ample supplies of high-quality water for municipal and domestic uses" (JRP Historical Consulting Services and Caltrans 2000).

The EBMUD was established in 1923 and acquired rights to the Mokelumne River the following year. Bonds were issued to secure funding for the construction of a water system delivering water from Highland Peak in the Sierra Nevada to the Sacramento-San Joaquin Delta. The original aqueduct was built in 1929, within a 100 foot right-of-way that provided for the eventual expansion of the system to include two more pipelines. Post-World War II population growth spurred the addition of a second pipeline in 1949, which increased the system's capacity from 42 million gallons per day to 105 million gallons. By 1963, further growth of the region resulted in the addition of the third pipeline. Today, the system provides 1.4 million people and 35 municipalities with water (Austin 2022; Hamman 1949).

The Pardee Dam and Reservoir (38 miles northeast of Stockton) impounds water from the Mokelumne River. The 345-foot-high concrete gravity arch dam provides a capacity of 198,000 acre-feet of municipal water supply. The water from the reservoir travels "through the 2.2-mile Pardee Tunnel and then into the 82-mile three-barreled Mokelumne Aqueduct to cross the foothills and the Central Valley where at Lodi, the aqueduct joins up with the Folsom South Canal" (Austin 2022). From there, water is conveyed to Walnut Creek and is sent to an EBMUD filtration plant or reservoir (Austin 2022).

The 0.95-mile-long section of the Mokelumne Aqueduct within the API is buried and presumably includes the three pipelines dating from 1929, 1949, and 1963. A newspaper article from 1949 described the construction of the aqueduct's second pipeline, which was built of primarily steel pipe with some concrete pipe sections. Consolidated Western Steel Corporation and the United Concrete Pipe Company provided the two different pipes (Hamman 1949).

3.2.3 Transportation

Maps of the API from 1856 and 1857 depict two parallel roads extending in a northeast-southwest orientation through the western half of the API, the easternmost of which roughly follows the alignment of present-day SR 88 (General Land Office 1855, 1865). The remainder of the API was sparsely developed during this time. Although the API still retains its rural character, arrival of the SPRR led to the establishment of a new railroad town at Lodi at the west end of the API in 1869 (City of Lodi California n.d.). The SPRR mainline extended in a north-south orientation through Lodi approximately 0.82 mile west of the API and also passed through the nearby towns of Elk Grove, Galt, Stockton, Lathrop, and Altamont Pass, California. The SPRR currently forms part of the UPRR alignment.

Another railroad, the San Joaquin and Sierra Nevada Railroad (SJ&SNR), was built in the API environs shortly after the SPRR. The segment of the line between Lodi and Woodbridge, California, opened for business in 1882, while construction of the line continued eastward towards Lockeford, California (northeast of the API). The SJ&SNR passed approximately 0.26 mile north of the API and had an east-west orientation that followed present-day SR 12. SPRR acquired the SJ&SNR in 1888, and it subsequently became known as the SPRR Valley Spring Branch (Hees n.d.). The segment of the former SPRR Valley Spring Branch in the vicinity of the API is no longer extant.

The road historically in the location of present-day SR 88 was depicted as one of the major thoroughfares in the Central Valley in maps from the mid-1880s (Hall 1886, 1887). It connected Stockton, Waterloo, and Lockeford with communities in the Sierra Nevada. A map from 1894 later shows additional roads within the API, including East Harney Lane, Jack Tone Road, and East Kettleman Lane (USGS 2022). This trend of new road construction continued into the early twentieth century based on maps and aerials

(NETROnline 2022; USGS 2022). The expanding road network during this time reflects the area's burgeoning agricultural industry, which increased settlement in the region. Roads as well as railroads were important movers of goods and people, and thus also aided the growth of the agricultural industry and prompted settlement along their alignments.

A third railroad reached Lodi during the early twentieth century: the CCTR, which extends through the west end of the API. The portion of the line between Stockton and Lodi was completed in 1907, and the portion between Lodi and Sacramento was completed in 1910. The CCTR line currently is owned by UPRR and BNSF (JRP Historical Consulting Services 2003).

3.2.4 Power Infrastructure

Power infrastructure within the API consists of PG&E Brighton-Bellota 230 kV transmission line, PG&E Rio Oso-Lockeford 230 kV transmission line, LEU Industrial Substation, and PG&E Lockeford Substation, as well as the following 60 kV power lines associated with the substations: PG&E Industrial Tap, PG&E Lockeford-Industrial, PG&E Lodi-Industrial, PG&E Lockeford #1, PG&E Sutter Home Switching Station-Lockeford-Lodi, PG&E Lockeford-Lodi No. 2, and PG&E Lockeford-Lodi No. 3.

During the first half of the twentieth century, California experienced immense growth, which led to development of a complex utility network. Early hydroelectric and transmissions systems supplied power to agricultural valleys and distant cities along the coast. Long distance electric power lines were developed across California in the first decades of the twentieth century as electricity demands increased (Walker 2017).

PG&E, which formed in 1905 when multiple gas and electric companies in the Bay Area consolidated, emerged as an early leader in electrical systems development. By the end of the 1920s, PG&E expanded its reach by purchasing dozens of smaller geographically focused utilities, such as San Joaquin Light and Power Company (Walker 2017). As such, PG&E enjoyed monopoly status during the Great Depression and entering the post-war period, which brought rapid growth to the valley communities in the region. The company projected that the area load demand would double in the decade between 1945 and 1955 (Walker 2017). To address this growing demand for energy at the midcentury, PG&E announced a $350,000,000 construction program to expand electricity and natural gas services in Northern and Central California (*Contra Costa Gazette* 1947).

Review of historic aerials and maps show the development of power infrastructure within and around the API during this period (NETROnline 2022; USGS 2022). PG&E Brighton-Bellota 230 kV transmission line represents the first part of this construction. Its northwest-southeast alignment extending through the extreme east end of the API first appears in a 1939 topographical quadrangle. Nearly a decade later, PG&E Lockeford Substation (located along East Kettleman Lane to the east of SR 88) was put in service in December 1948 (No author 1949). PG&E Rio Oso-Lockeford 230 kV transmission line that extends from PG&E Lockeford Substation to the existing alignment of PG&E Brighton-Bellota 230 kV transmission line to the east, which was built later, first appearing between 1961 and 1968 topographic quadrangles (NETROnline 2022; USGS 2022). LEU Industrial Substation southeast of the intersection of South Cluff and East Lodi avenues in Lodi dates from sometime between 1984 and 1993 based on aerials (NETROnline 2022). PG&E Industrial Tap, PG&E Lockeford-Industrial, and PG&E Lodi-Industrial 60 kV power lines reaching LEU Industrial Substation were erected after its construction. The remaining PG&E 60 kV distribution lines within the API (PG&E Lockeford #1, PG&E Sutter Home Switching Station-Lockeford-Lodi, PG&E Lockeford-Lodi No. 2, and PG&E Lockeford-Lodi No. 3) are associated with PG&E Lockeford Substation and were built sometime between 1993 and 2002 based on aerials (NETROnline 2022).

4. Survey Methods

Investigators who meet the Secretary of the Interior's Professional Qualification standards in Architectural History and History, per 36 CFR Part 61, oversaw the completion of an architectural field survey of the entire API between December 15 and 22, 2022. The survey was conducted from public vantage points and public rights-of-way. If surveyed resources were not visible or accessible from public areas, investigators completed supplemental research to record and evaluate the resources, such as review of current mapping software, historic maps, aerials, historic newspaper databases, city directories, and other sources.

Prior to initiating fieldwork, investigators exported parcel data for the API from the San Joaquin County Assessor and ParcelQuest and uploaded it to ArcGIS Collector. This information included parcel boundaries as well as relevant information such as parcel address, assessor's parcel number (APN), and construction year. Investigators also uploaded shapefiles showing the locations of previously recorded architectural resources within the API.

During the survey, investigators used the ArcGIS Collector application loaded with the above-mentioned shapefiles to collect geotagged photographs of each property constructed on or before the survey cutoff date of 1977, including any accessory resources, and took notes on architectural style, form, condition, and historic integrity. Investigators also assigned estimated construction dates to properties based on field verification of San Joaquin County Assessor and ParcelQuest data, professional judgement, and historical research, including historic maps, aerials, newspaper databases, and other sources. The distribution of the resources that met the survey cutoff data (i.e., constructed on or before 1977) are presented in Appendix A, Figure 4.

The extent of the API was also field verified to determine if the Project would be visible past the 500-foot-radius buffer surrounding the new transmission line. In several instances, the API was expanded to include the full extent of a parcel and other interrelated properties due to existing conditions, such as flat topography, limited development, and lack of other visual intrusions. Oftentimes, a building cluster would be located immediately outside the API limits; however, since the building cluster was associated with properties within the API, it was recorded as part of an interrelated resource, including the portion outside the API. For example, residences and outbuildings were frequently outside the limits of the API; however, since they were directly and historically associated with agricultural fields and orchards within the API, the entirety of the property was recorded and the API was expanded.

Resources meeting the 1977 survey cutoff date were documented in the survey results matrix in Appendix C and recorded on Department of Parks and Recreation (DPR) 523 series forms in Appendix D. No resources constructed after the 1977 survey cutoff date appeared to possess exceptional significance; therefore, none of these resources were recorded. In areas where the new PG&E transmission line is being constructed alongside an existing transmission line with structures of a similar height as the proposed features, investigators confirmed in the field that no new visual intrusions would occur to properties within the API. This was completed through assessing existing viewsheds from public vantage points, the historic character and setting of the area, building orientation, existing vegetation, topography, and age of existing visual intrusions. If this assessment determined there would be no visual changes from the new line, the resources within the API were not recorded or evaluated as part of this report. Representative photographs of where there would be no visual changes from the new line are included in Appendix B, Photographs 17 through 22.

Survey methods were designed to meet local, state, and federal requirements, and follow guidance put forth in California Office of Historic Preservation's *Instructions for Recording Historical Resources*. The survey was also consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 Federal Register 44716).

5. Survey Results

The background research and architectural field survey identified 68 architectural resources within the API meeting the 1977 survey cutoff date that are recorded and evaluated as part of this report (refer to the survey results matrix in Appendix C and DPR 523 series forms in Appendix D). Of these, 67 resources are newly identified and one is a previously unrecorded segment of the CCTR (P-39-004457) within the API.

Notably, the survey did not identify any evidence of the previously recorded segment of the SPRR within the API (P-39-000002). As described in Section 2.1.1, review of previous recordation forms for the SPRR as well as historic maps and aerials indicate that the line did not extend through the API. Therefore, the previously recorded segment within the API in the PG&E MapGuide Database cultural layer appears to be an error. This is corroborated by the survey results, which did not identify any railroad features in this location.

During post-field research, one resource that the San Joaquin County Assessor indicated met the 1977 survey cutoff date was discovered to be built in 1980 (Resource Identifier 62; 13589 East Kettleman Road). The San Joaquin County Assessor provides a construction date of 1915 for the property with an effective year of 1980 (ParcelQuest 2022). Aerial photographs from 1957 and 1967 show the property as purely agricultural land with no buildings, indicating the 1915 date of construction provided by the assessor is inaccurate. The existing residence first appears between the 1967 and 1984 aerials, indicating the 1980 construction date provided by the assessor is accurate (NETROnline 2022). This was corroborated by professional judgement based on field survey results. Based on this information, the property was not recorded or evaluated for listing in the CRHR as part of this report because it is does not meet the 1977 survey cutoff date.

The following summarizes the efforts of the architectural field survey. Section 6 presents determinations of eligibility. The resources are mapped in Appendix A, Figure 5.

5.1.1 Central California Traction Railroad (P-39-004457)

The segment of the CCTR within the API is newly identified. Other segments of the line outside the API have been previously recorded and are unevaluated or were recommended not eligible for listing in the CRHR and NRHP. The previously recorded segment of the line nearest the API is a 100-foot-long segment at the railroad's intersection with SR 12, approximately 250 feet north of the API. The segment was not evaluated for listing in the CRHR or NRHP, however, the record noted that the rails, ties, and crossing guards associated all appeared to be non-original. The approximately 2.5-mile-long segment of the CCTR within the API also appears to feature non-original rails and ties.

5.1.2 Previously Unrecorded Resources

Overall, 67 resources meeting the 1977 survey cutoff date were newly identified within the API. Of these resources, 41 are rural residential, 7 are industrial, 6 are suburban residential, 5 are farm buildings on agricultural land, 4 are water conveyance features, 3 are electrical infrastructure, and 1 is a cemetery. These properties have the following characteristics:

- Rural residential properties consist of mainly Ranch, Minimal Traditional, Queen Anne, and eclectic styles. Most contain outbuildings, including garages, barns, shops, sheds, and carports.
- Industrial properties are mainly utilitarian warehouses, shops, garages, or manufacturing plants.
- Suburban residential include properties on small quarter-acre lots within the City of Lodi

- Farm buildings included sheds, shops, barns, or warehouses related to agricultural production located on a parcel with no residence.

- Water conveyance and control features within the API consist of two earthen levees and two underground pipelines.

- Electrical infrastructure consists of one PG&E substation and two PG&E 230 kV transmission lines.

- The one cemetery is the Lodi Memorial Park and Cemetery.

Eighteen of the newly identified properties within the API were built between 1900 and 1920, 11 were built between 1920 and 1940, 19 were built between 1940 and 1960, and 19 were built between 1960 and 1977.

6. Resource Eligibility and Assessment of Potential Impacts

6.1 Resource Eligibility

Previously recorded segments of the CCTR are unevaluated or were evaluated as not eligible for listing in the CRHR. This report recommends the CCTR segment newly identified within the API as not eligible for listing in the CRHR as an individual resource or as a potential contributor to a larger resource. The resource does not have a direct association with important events or trends and is not a design or engineering achievement.

Of the 67 newly identified resources, 7 are evaluated as eligible for listing in the CRHR and, therefore, are considered historical resources for the purposes of CEQA for this Project. One resource is recommended eligible only under Criterion 1, two resources are recommended eligible only under Criterion 3, and four resources are recommended eligible under both Criteria 1 and 3. The following identifies these resources and summarizes the evaluations. Refer to the survey results matrix in Appendix C and DPR 523 series forms in Appendix D for more information on these resources, including full evaluations.

- Resource Identifier 21 (15661 North Curry Avenue; APN 049-230-260) is eligible for listing in the CRHR under Criteria 1 and 3 for illustrating early-twentieth century agricultural settlement in Lodi and as a good, intact representation of a 1920s rural residential property with a Craftsman-style residence, tank house, and garage. The property retains integrity and communicates its character and appearance from its construction.

- Resource Identifier 25 (15277 North Curry Avenue; APN 049-230-100) is eligible for listing in the CRHR under Criterion 3 as a representative example of a Queen Anne-style rural residence within San Joaquin County. The property reflects character-defining features of the style through its high-pitched roof with prominent gable, patterned shingles, asymmetrical massing, and partial-width porch and retains a high degree of integrity.

- Resource Identifier 30 (7106 East Kettleman Lane; APN 061-132-110) is eligible for listing in the CRHR under Criterion 3 as it embodies a Folk Victorian-style residence through its high-pitched roof with prominent gable, full-width front porch, spindle work porch detailing, clapboard exterior, and original windows. Other than a replacement front door, the resource appears to be unchanged.

- Resource Identifier 32 (7150 East Kettleman Lane; APN 061-133-010) is eligible for listing in the CRHR under Criteria 1 and 3 for illustrating early-twentieth century agricultural settlement in Lodi and as a good, intact representation of a 1930s rural residential property with a Craftsman-style residence, tank house, and garage. The property retains integrity and communicates its character and appearance from its construction in 1936.

- Resource Identifier 34 (7280 East Kettleman Lane; APN 061-133-030) is eligible for listing in the CRHR under Criterion 3 as an excellent example of a Craftsman-style residence in rural San Joaquin County. The property possesses intact elements of the style, including a partial-width front porch with its roof supported by battered wood columns, exposed rafter tails, a low-pitched roof with wide unenclosed eaves, triangular knee braces, and its original front door. It would be recognizable to persons from the past and retains integrity.

- Resource Identifier 47 (13915 North Locust Tree Road; APN 630-150-460) is eligible for listing in the CRHR under Criterion 3 for embodying a Mediterranean-style residence in a rural context. It displays character-defining features of the style such as stucco walls, a low-pitched tile roof, and a simple massing that emphasizes horizontal lines.

- Resource Identified 67 (Mokelumne Aqueduct segment within the API) is eligible for listing in the CRHR under Criterion 1 for its associations with interbasin water transfer to supply domestic and municipal water to growing urban areas and its role in the development of the East Bay area.

The remaining 60 newly identified resources were evaluated as not eligible for listing in the CRHR. Resources not found eligible for listing in the CRHR will not be impacted by the Project. Refer to the survey results matrix in Appendix C and DPR 523 series forms in Appendix D for more information on these resources, including full evaluations.

6.2 Assessment of Potential Impacts

The following table summarizes the potential impacts that may occur to the 7 resources evaluated as eligible for listing in the CRHR and considered historical resources for the purposes of CEQA for this Project. Project elements referenced in Table 6-1 correspond to Appendix A, Figure 2.

Table 6-1. Assessment of Potential Impacts to CRHR Eligible Resources

Resource Identifier	Address; APN	Project Element Proximity	Assessment
21	15661 North Curry Avenue; 049-230-060	Located approximately 500 feet southeast of structure W38 and approximately 352 feet east of centerline of preferred alignment	Modern-age industrial buildings are viewable from North Curry Avenue. Therefore, integrity of setting has already been diminished. The Project will not impact the aspects of integrity that convey this resource's significance under Criteria 1 and 3. The new transmission line will not impact the property's integrity of location, design, setting, materials, workmanship, feeling, and association. The installation of Project elements over 350 feet from the resource will not modify its historic appearance or character or alter any of its character-defining features. No physical impacts will occur to the property as part of the Project.
25	15277 North Curry Avenue; 049-230-100	Located approximately 572 feet southeast of structure W37 and approximately 480 feet east of centerline of preferred alignment	Modern-age industrial buildings are viewable from North Curry Avenue. Therefore, integrity of setting has already been diminished. The Project will not impact the aspects of integrity that convey this resource's significance under Criterion 3. The new transmission line will not impact the property's integrity of location, design, setting, materials, workmanship, feeling, and association. The installation of Project elements 480 or more feet from the resource will not modify its historic appearance or character or alter any of its character-defining features. No physical impacts will occur to the property as part of the Project.
30	7106 East Kettleman Lane; 061-132-110	Located approximately 1,150 feet northeast of structure W31 and approximately 1,100 feet from centerline of preferred alignment	Modern-age residential buildings are viewable from Vintage Road and East Kettleman Lane. Therefore, integrity of setting has already been diminished. The Project will not impact the aspects of integrity that convey this resource's significance under Criterion 3. The new transmission line will not impact the property's integrity of location, design, setting, materials, workmanship, feeling, and association. The installation of Project elements 1,150 or more feet from the resource will not modify its historic appearance or character or alter any of its character-defining features. No physical impacts will occur to the property as part of the Project.

Resource Identifier	Address; APN	Project Element Proximity	Assessment
32	7150 East Kettleman Lane; 061-133-010	Located approximately 1,100 feet northwest of structure W30 and approximately 1,100 feet from centerline of preferred alignment	The building cluster associated with this property, consisting of a Craftsman-style residence, tank house, and garage, is setback approximately 1,100 feet from the proposed Project improvements and already has limited visibility of proposed improvements due to location and foliage. As a result, the Project improvements will not impact its integrity of location, design, setting, materials, workmanship, feeling, and association, and the property will still convey its significance under Criteria 1 and 3. No physical impacts will occur to the property as part of the Project.
34	7280 East Kettleman Lane; 061-133-020	Located approximately 1,150 feet northwest of structure W30 and approximately 1,100 feet from centerline of preferred alignment	The Craftsman-style residence at this property is setback approximately 1,100 feet from the proposed Project improvements. Views of the proposed improvements will be limited due the setback and existing foliage. As a result, the Project improvements will not impact its integrity of location, design, setting, materials, workmanship, feeling, and association, and the property will still convey its significance under Criterion 3. No physical impacts will occur to the property as part of the Project.
47	13915 North Locust Tree Road; 063-150-460	Located approximately 800 feet southwest of structure W19 and approximately 750 feet south from the centerline of preferred alignment	Modern-age buildings are viewable from North Locust Tree Road. Therefore, integrity of setting has already been diminished. This resource is located approximately 750 feet from the proposed Project improvements. Views of the proposed improvements will be limited due the setback and existing foliage. As a result, the Project improvements will not impact its integrity of location, design, setting, materials, workmanship, feeling, and association, and the property will still convey its significance under Criterion 3. No physical impacts will occur to the property as part of the Project.
67	N/A	Located approximately 650 feet southeast of structure E1 and approximately 700 feet southeast from the centerline of preferred alignment	The property is a buried aqueduct segment that has no above-ground features within the API. The installation of Project elements 650 feet or more from the resource will not impact its integrity of location, design, materials, workmanship, feeling, and association, and the property will still convey its significance under Criterion 1. PG&E Brighton-Bellota 230 kV transmission line already intersects with the aqueduct segment. Therefore, because the setting already is characterized by electrical infrastructure, the Project elements will not diminish its integrity of setting. No physical impacts will occur to the property as part of the Project.

No significant impacts will occur to the 7 resources evaluated as eligible for listing in the CRHR as part of this report. In most cases, the Project improvements will range from at least approximately 352 feet to approximately 1,100 feet from the contributing resources within the property. There would be no physical impacts to these resources. Therefore, the resources would retain the aspects of integrity that convey their significance. The historic and current uses of these resources would remain intact (e.g., rural residential properties, some of which are engaged in small-scale agriculture on medium-sized parcels). In addition, the character-defining features associated with each resource, such as their massing, materials, orientation, and landscape features, would remain intact and not be diminished by the Project improvements. In addition, while the new PG&E transmission line may be visible from certain public vantage points, modern-era development has already diminished integrity of setting in these instances, and the Project improvements would be a marginal change that would not diminish the characteristics that make the resource significant.

6.3 Findings and Conclusions

In total, the API has 188 parcels, 95 of which were constructed prior to the survey cutoff date of 1977. Sixty-seven newly identified architectural resources and one newly identified segment of the CCTR (P-39-004457) within the API were recorded and evaluated in this report. Seven resources were evaluated as eligible for listing in the CRHR and, therefore, are considered historical resources for the purposes of CEQA for this Project. These resources will not be physically impacted by the Project, and existing visual intrusions and the distance of the proposed Project elements from the resources also limit impacts. Therefore, a finding of "Less than Significant Impacts to Historical Resources" is recommended for the Project, in accordance with CEQA Guidelines, Appendix G, and Section 21084.1.

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Appendix A
Figures

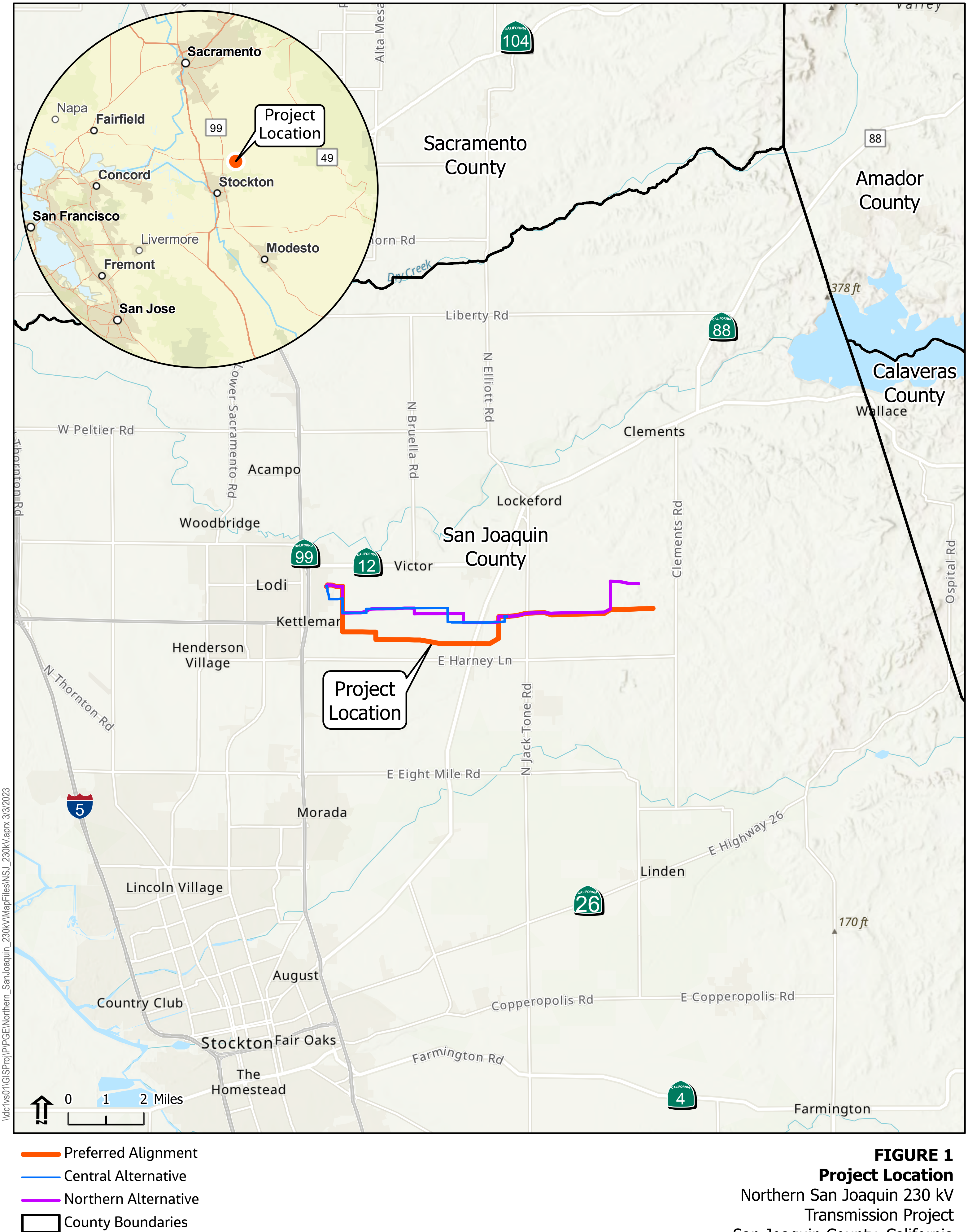
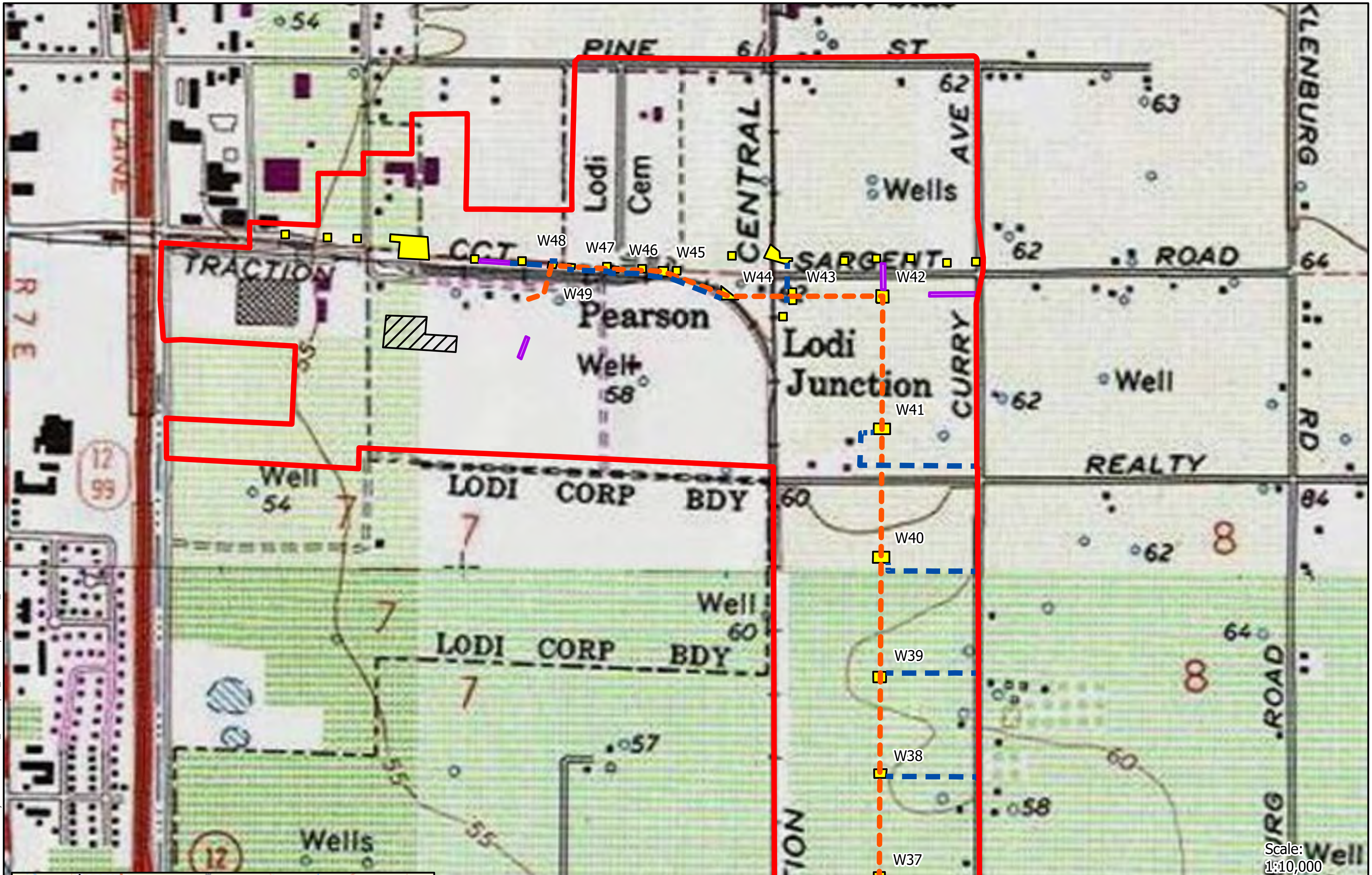


FIGURE 1
Project Location
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California



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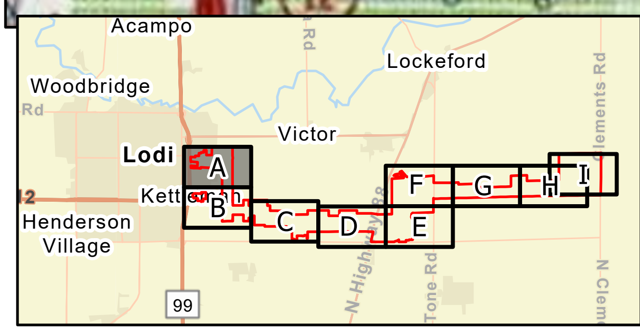


Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

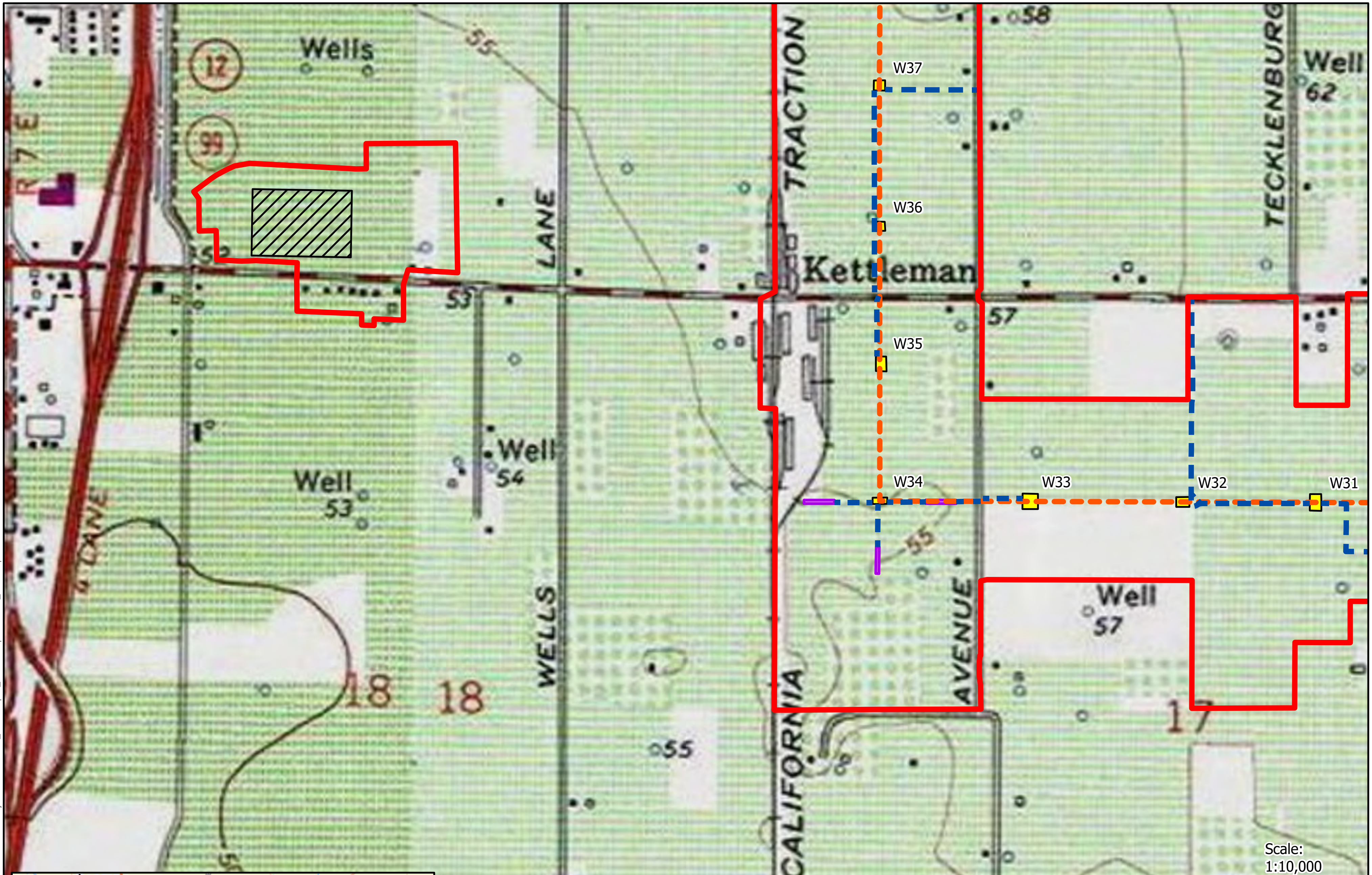
Staging Areas

Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2A
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California



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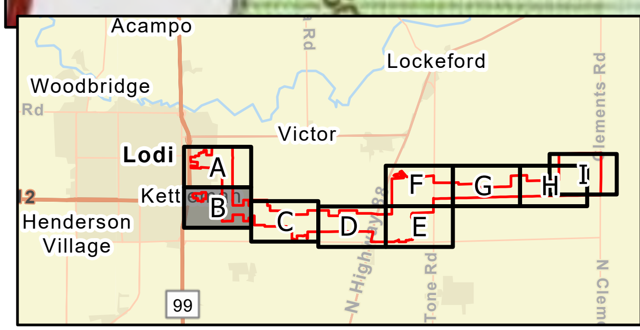


Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

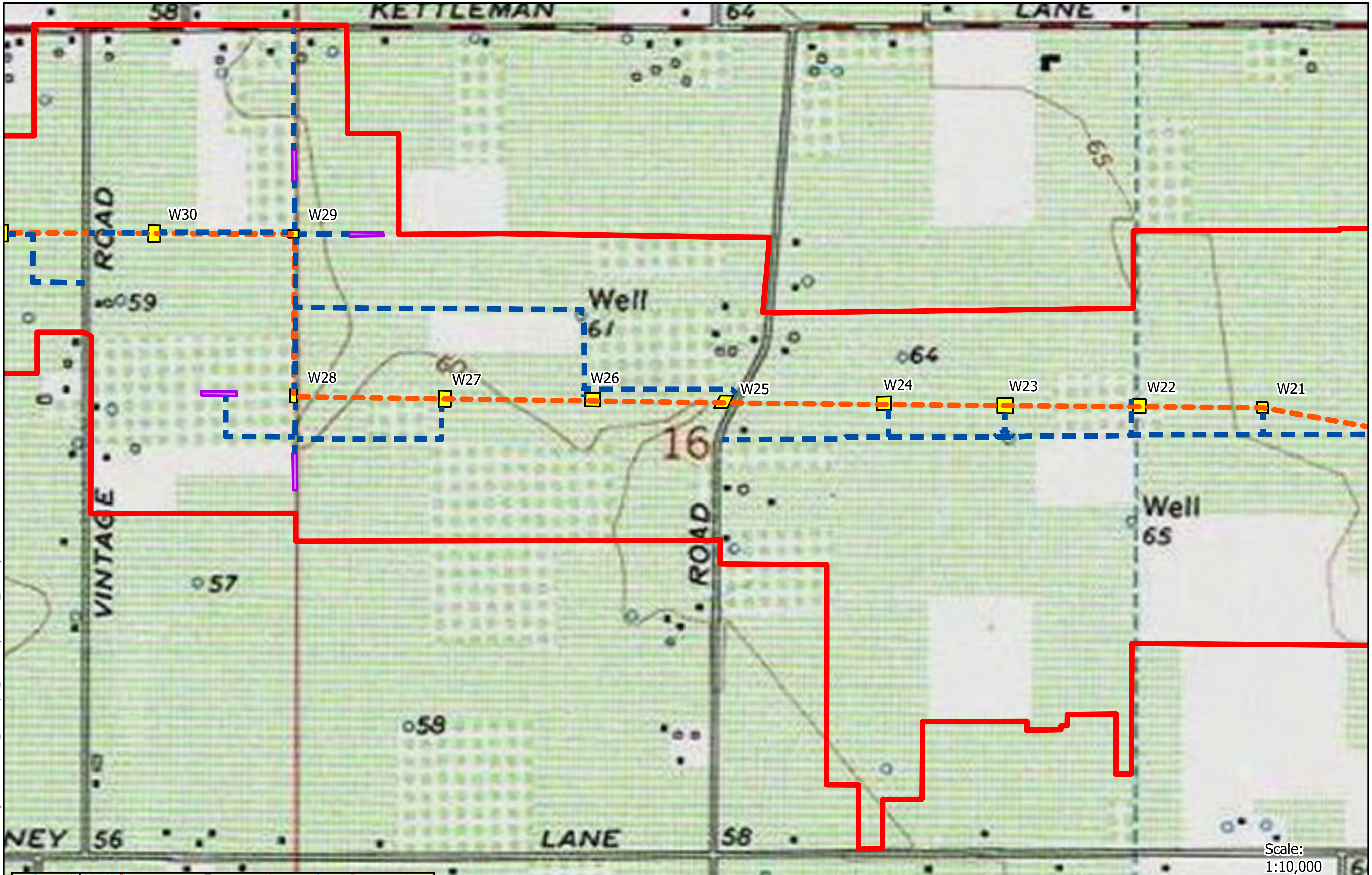
Staging Areas

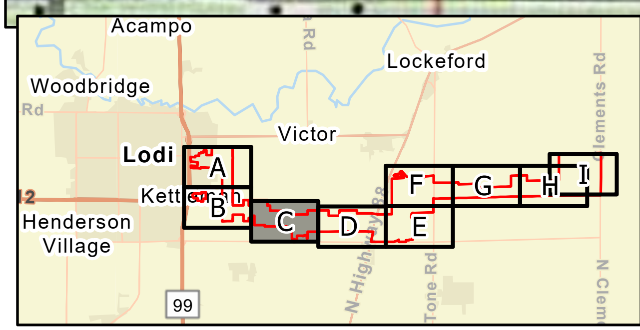
Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2B
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California





\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023

Area of Potential Impacts

Preferred Alignment

Access Route

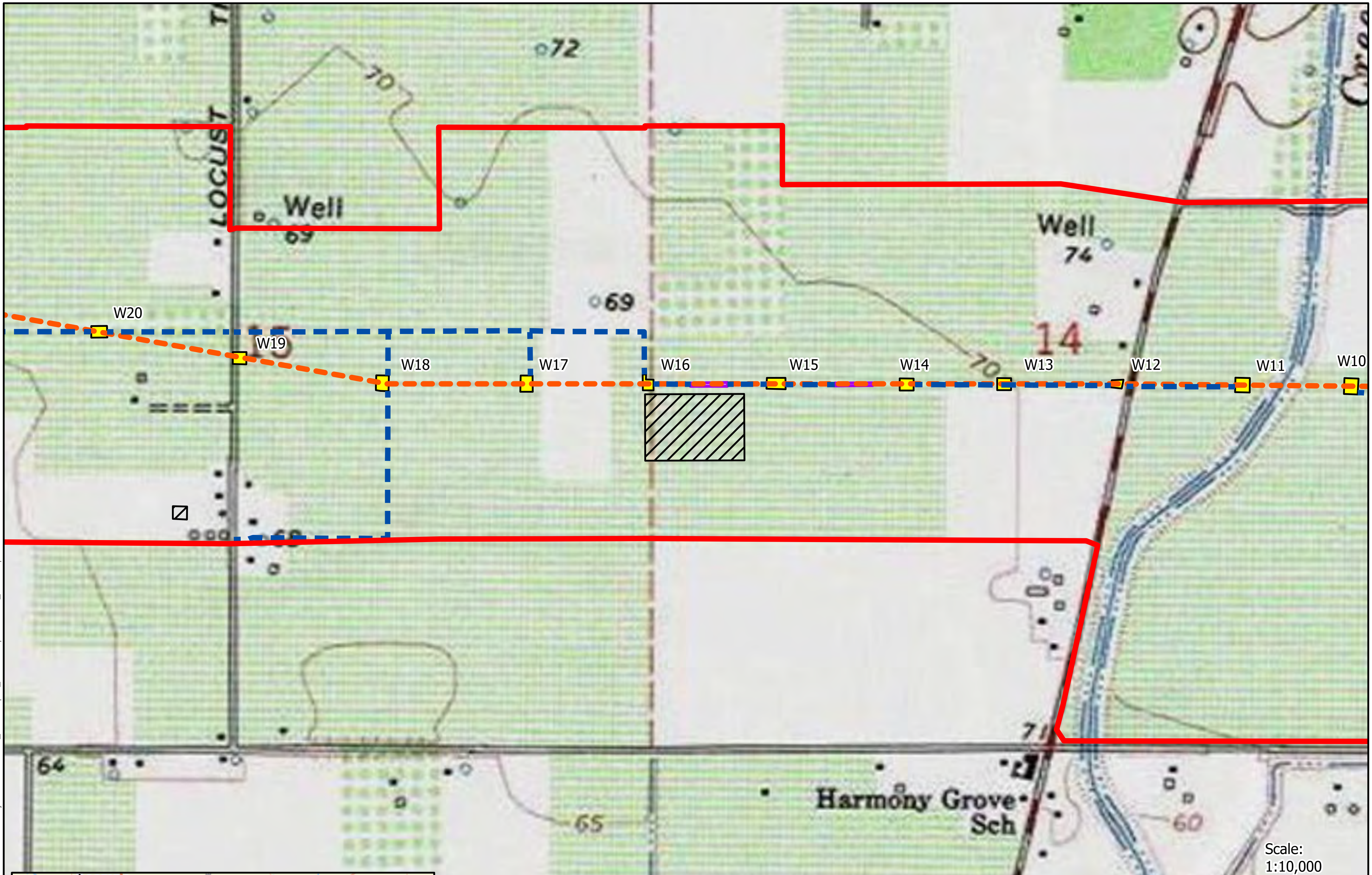
Pull Sites

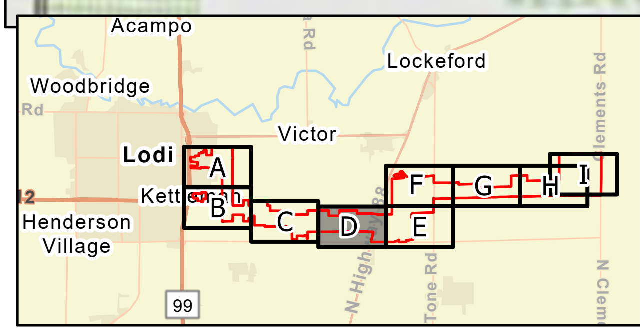
Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2C
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California





Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

Staging Areas

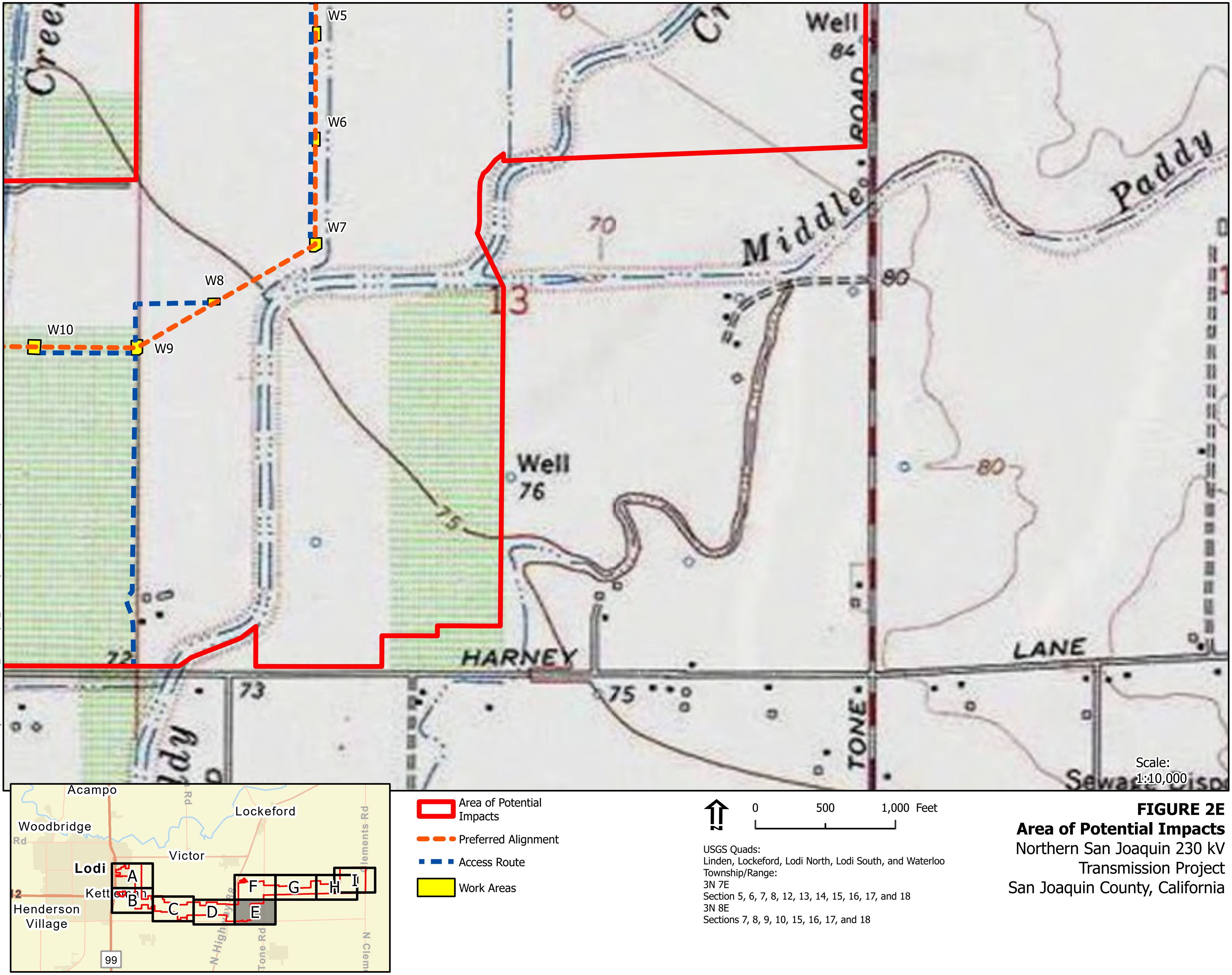
Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2D
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023



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Area of Potential Impacts

Preferred Alignment

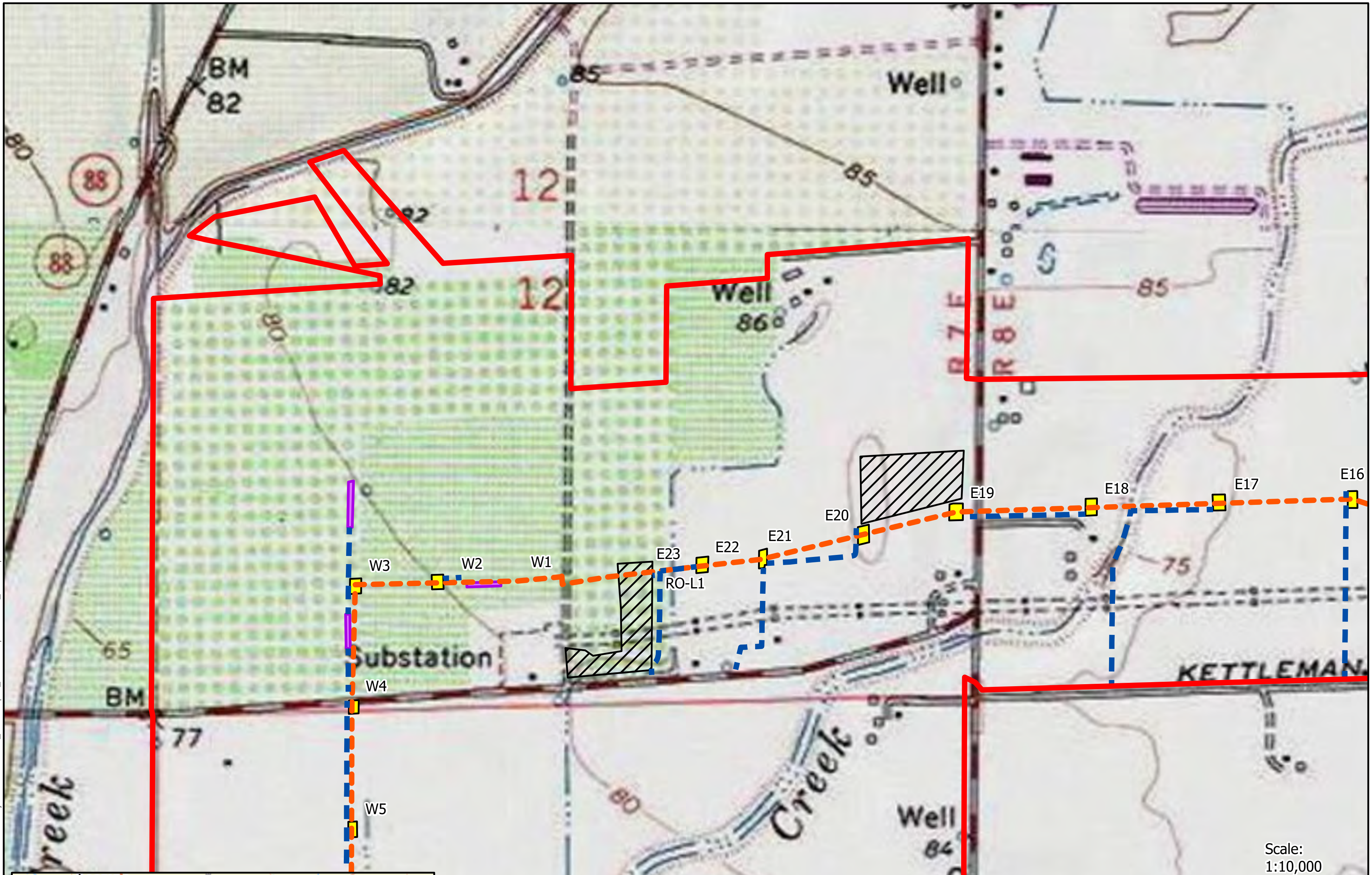
Access Route

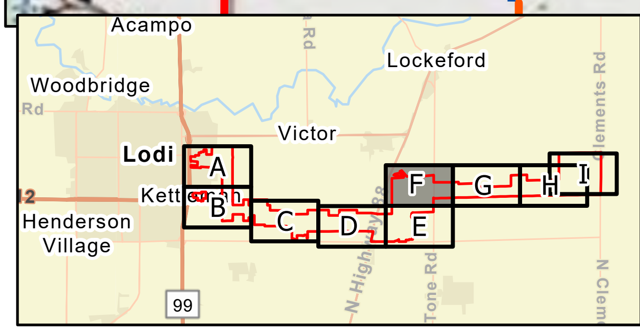
Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2E
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California





Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

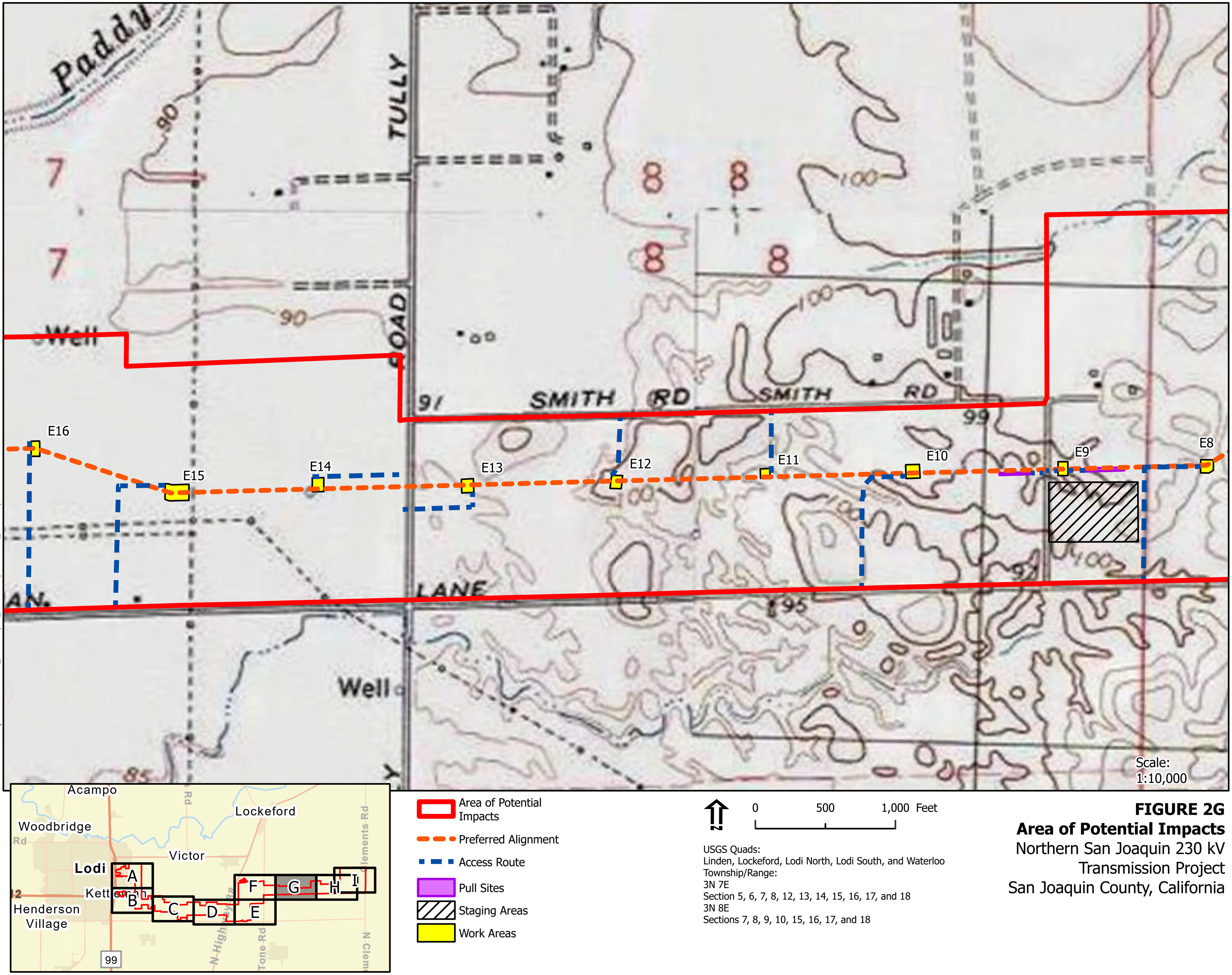
Staging Areas

Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2F
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California



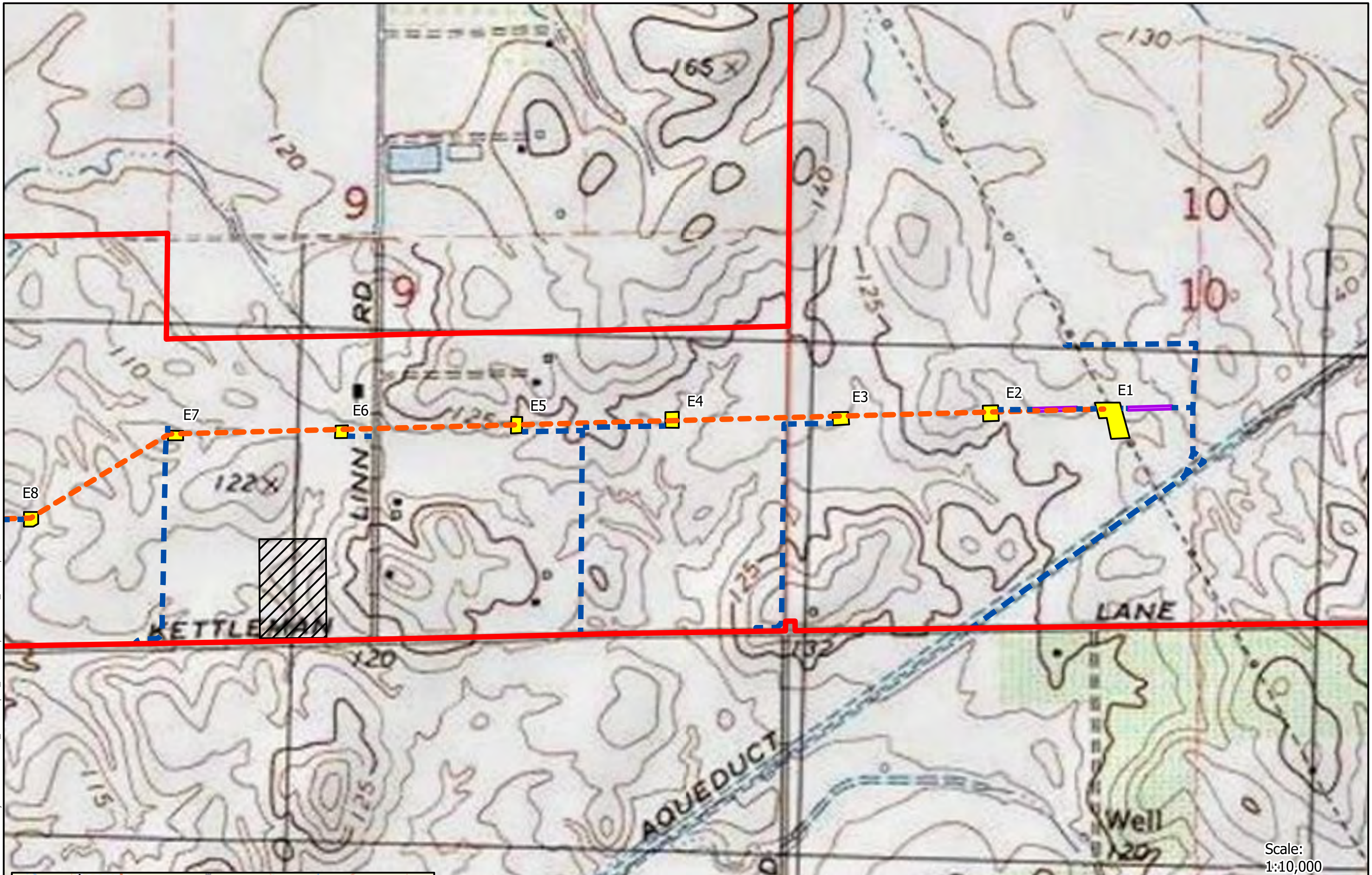
\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023

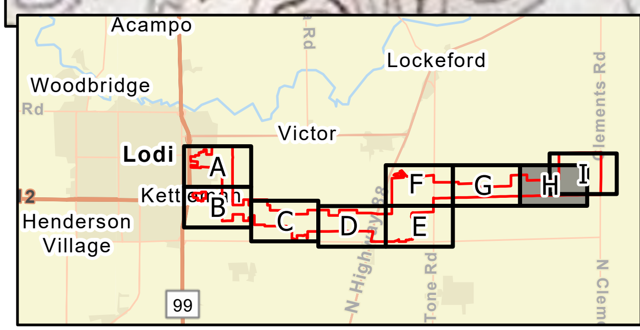
Area of Potential Impacts
Preferred Alignment
Access Route
Pull Sites
Staging Areas
Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2G
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California





Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

Staging Areas

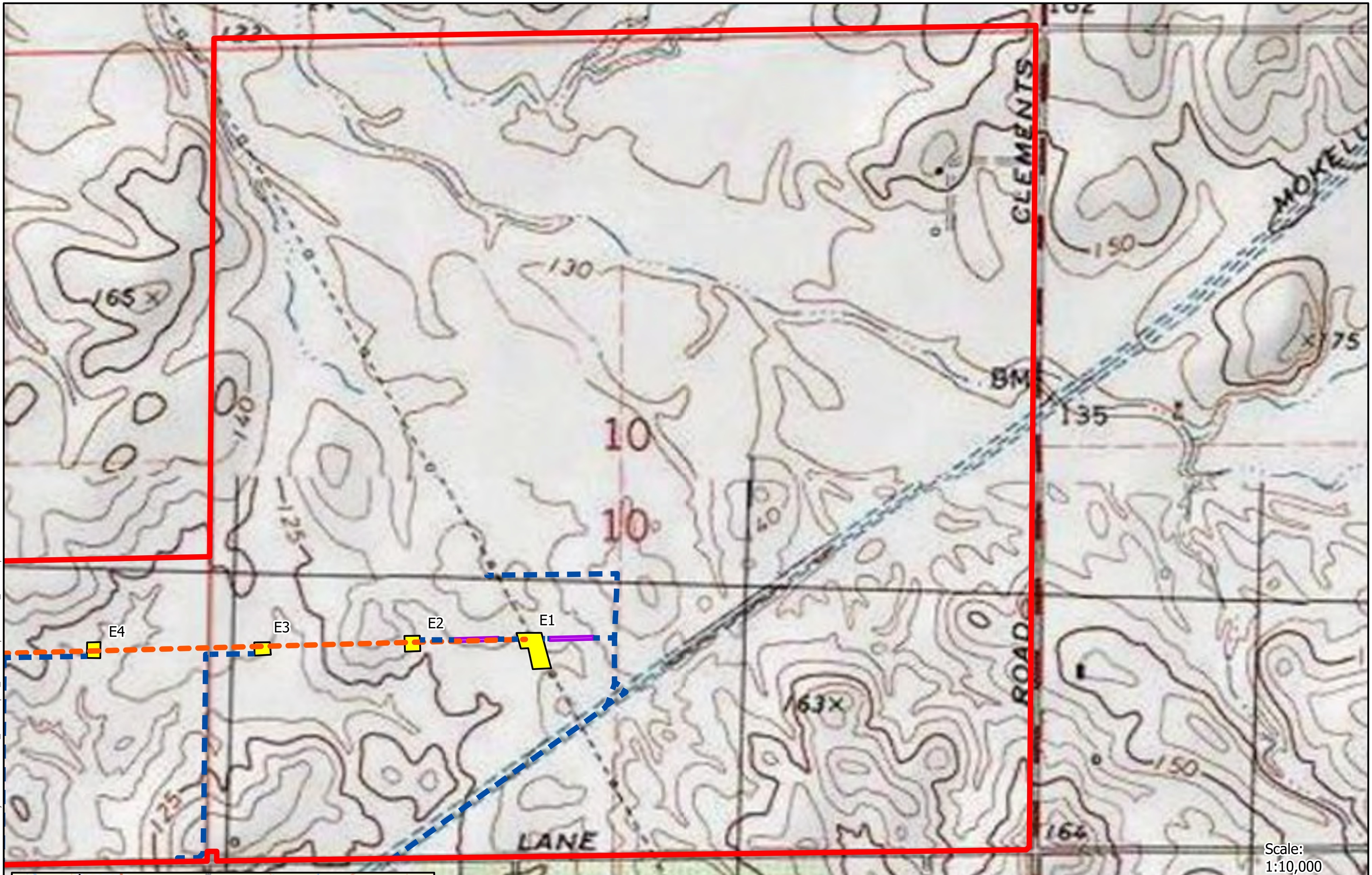
Work Areas

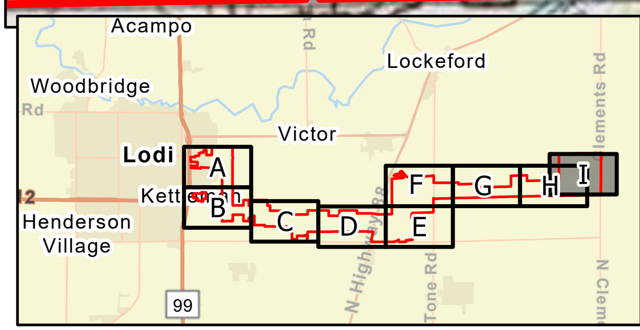
0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2H
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

Preferred Alignment

Access Route

Pull Sites

Work Areas

0 500 1,000 Feet

USGS Quads:
Linden, Lockeford, Lodi North, Lodi South, and Waterloo
Township/Range:
3N 7E
Section 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, and 18
3N 8E
Sections 7, 8, 9, 10, 15, 16, 17, and 18

FIGURE 2I
Area of Potential Impacts
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023

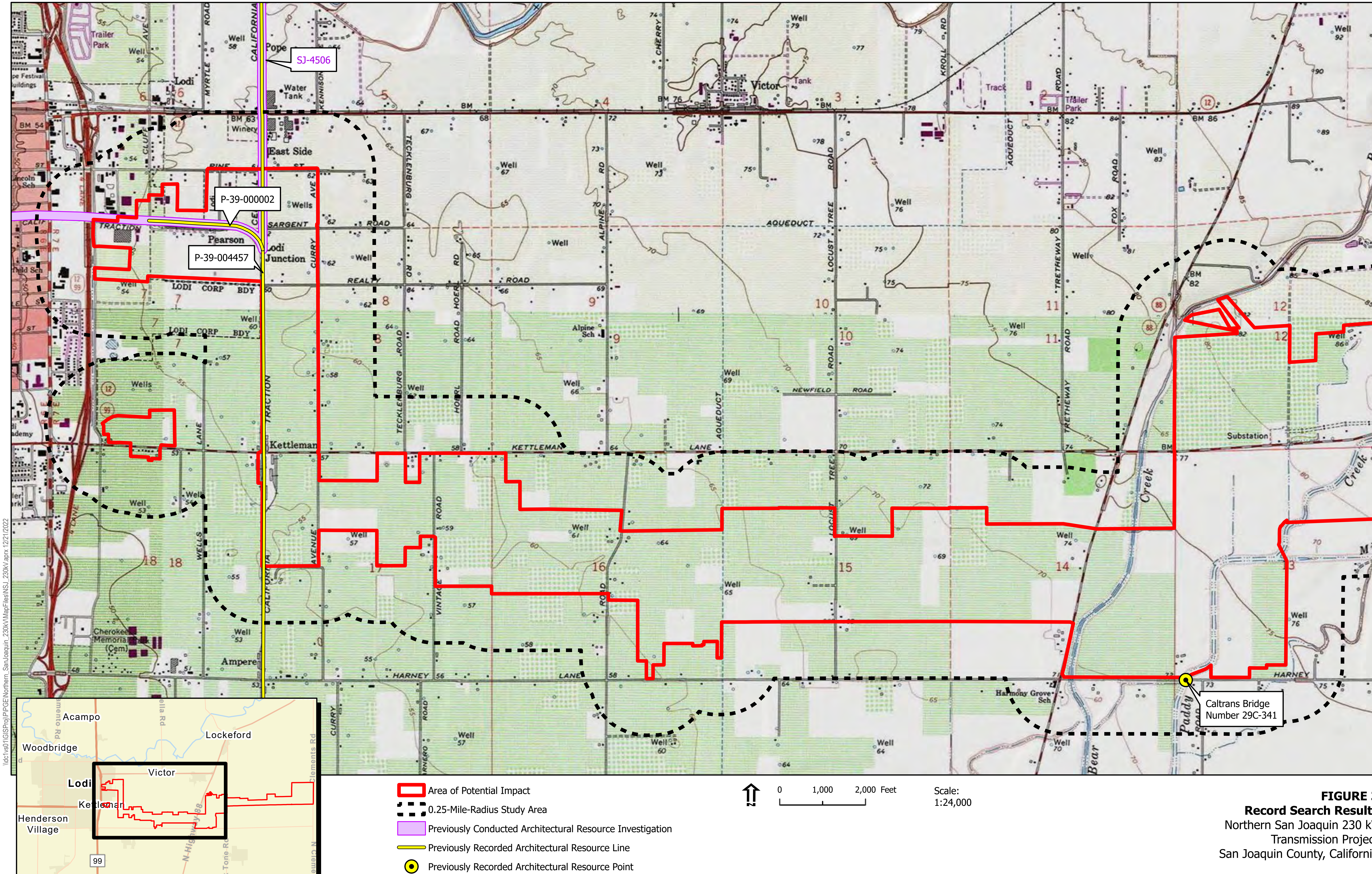
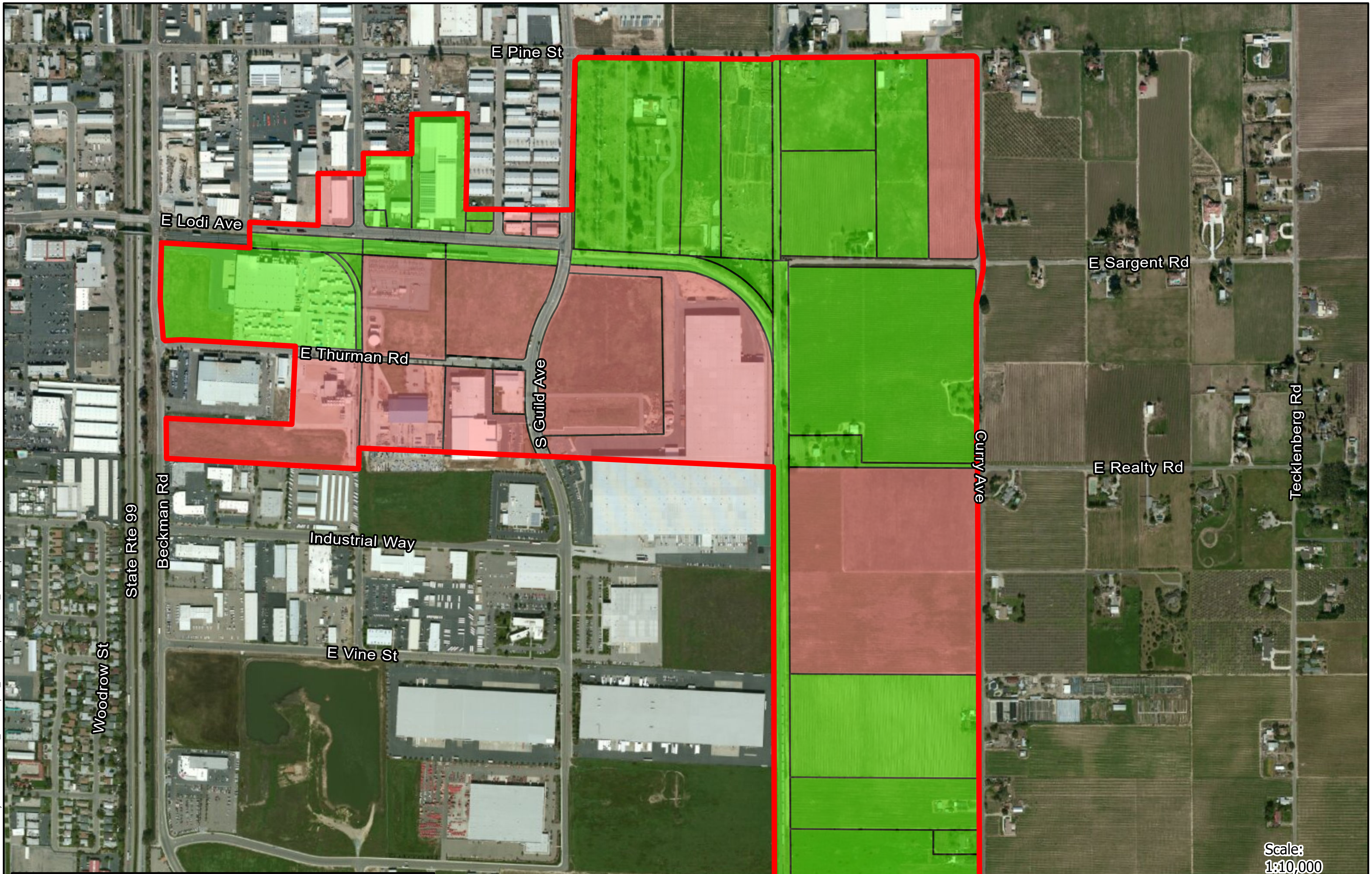
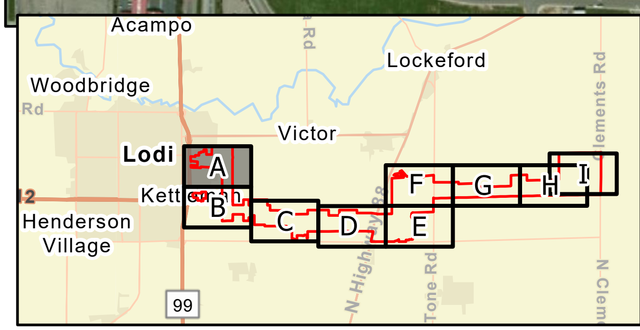


FIGURE 3
Record Search Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California





Area of Potential Impacts

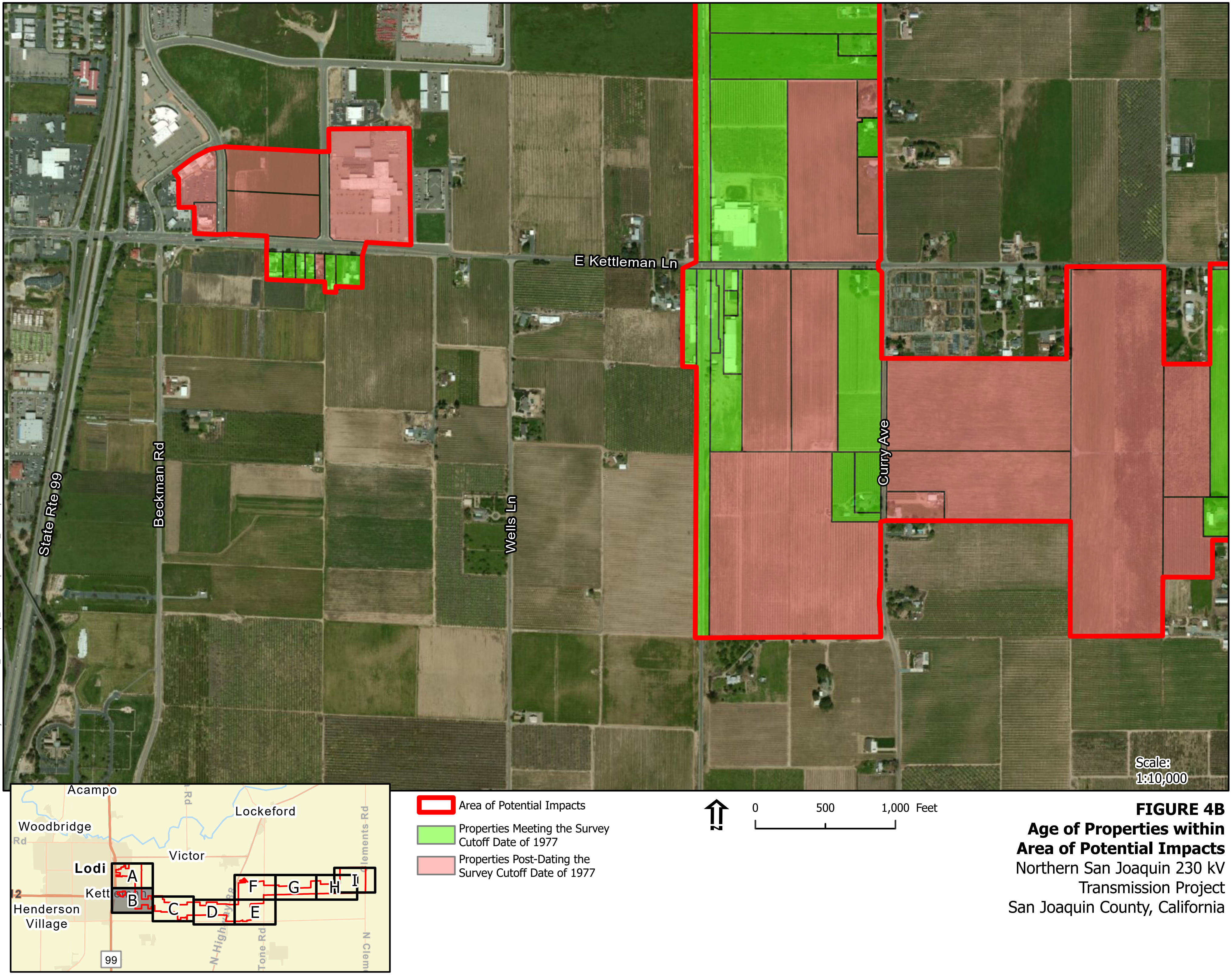
Properties Meeting the Survey Cutoff Date of 1977

Properties Post-Dating the Survey Cutoff Date of 1977

0 500 1,000 Feet

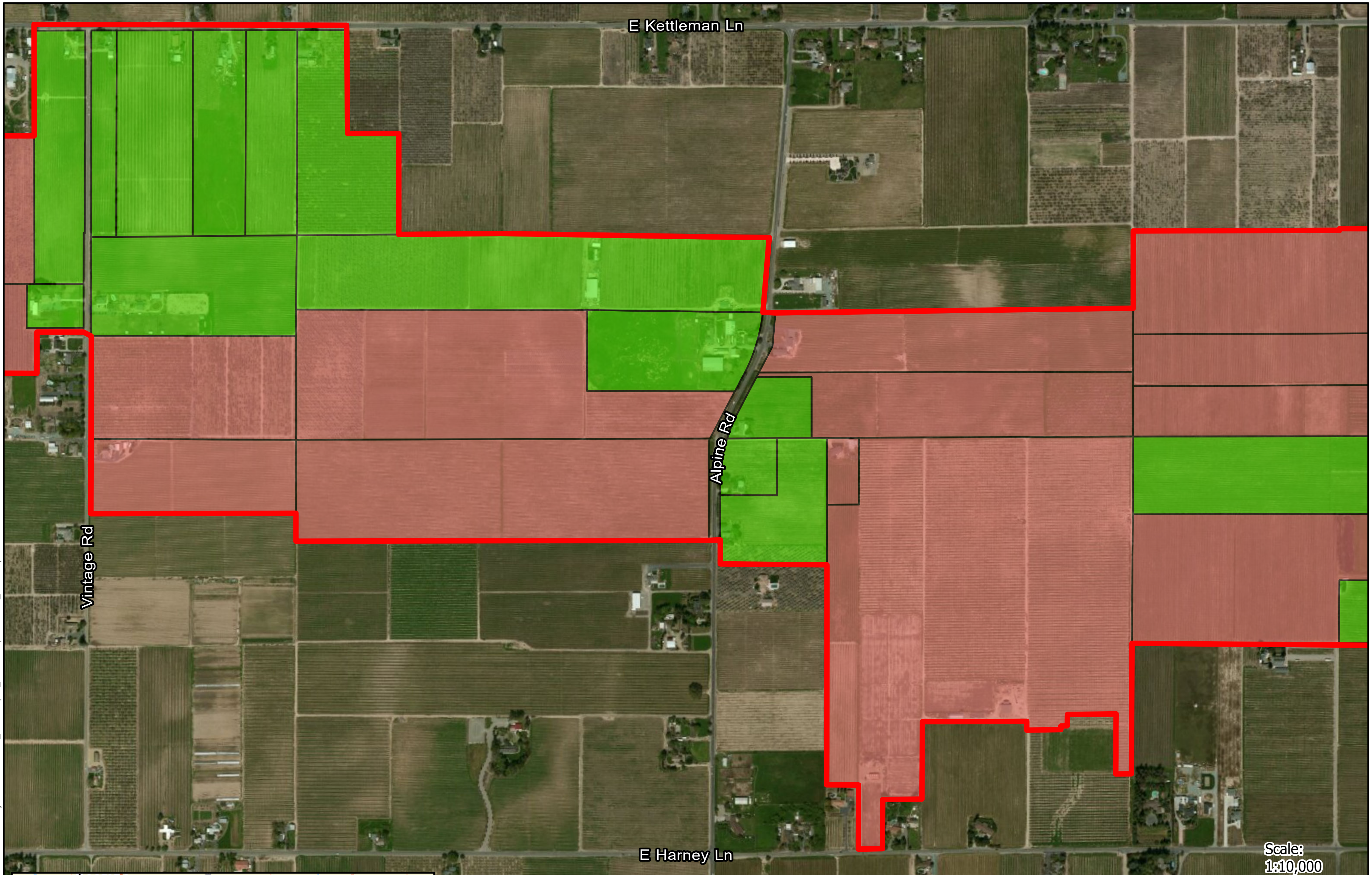
FIGURE 4A
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023



\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023

FIGURE 4B
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California



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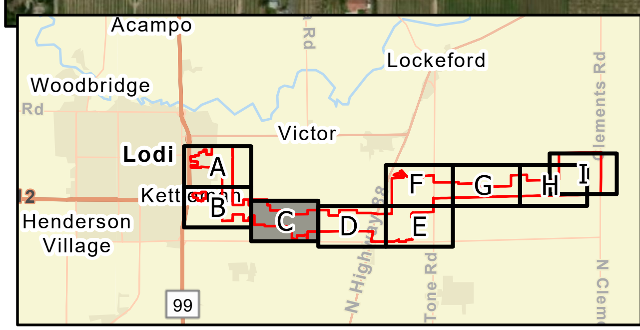


Area of Potential Impacts

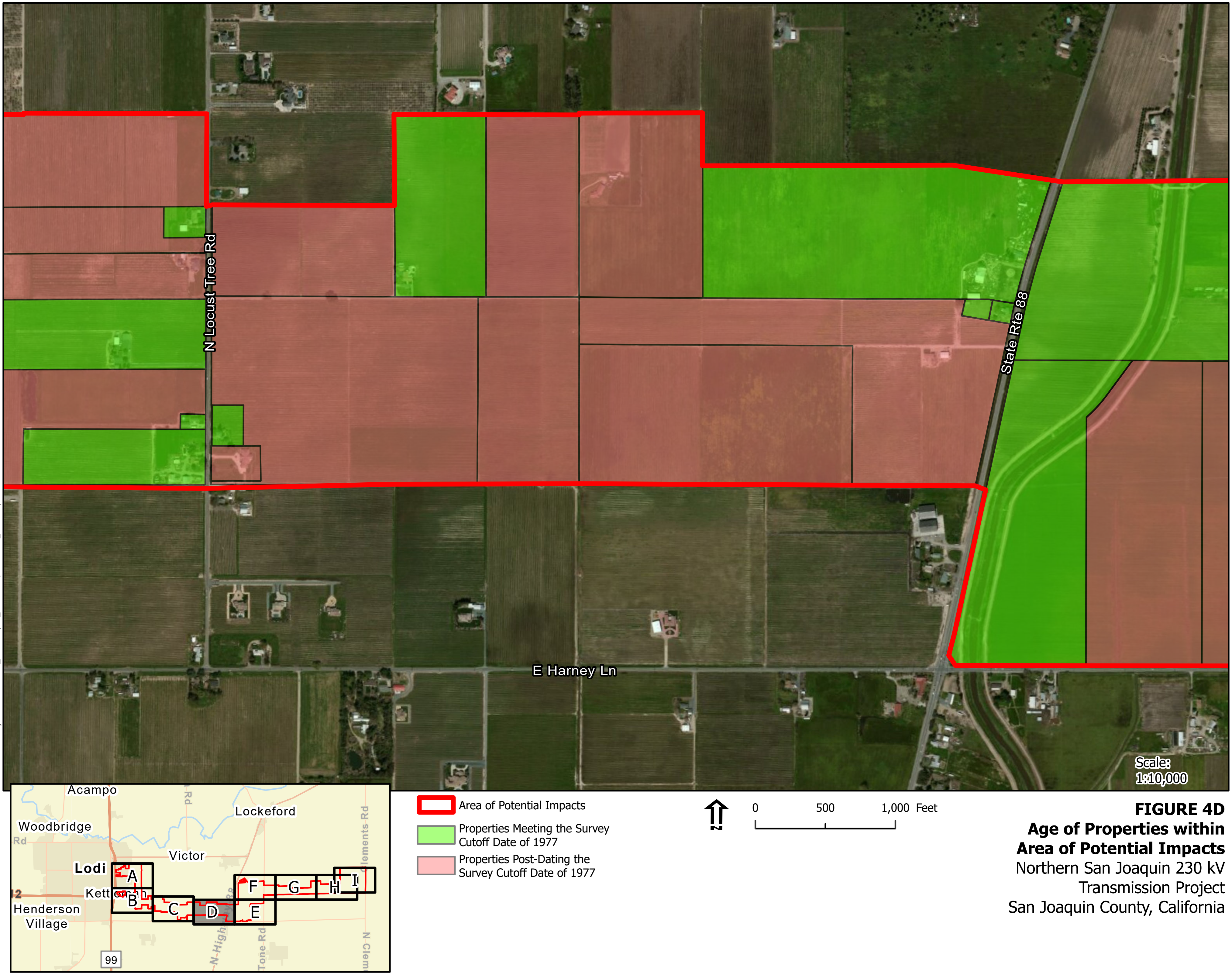
Properties Meeting the Survey Cutoff Date of 1977

Properties Post-Dating the Survey Cutoff Date of 1977

N

0 500 1,000 Feet

FIGURE 4C
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California



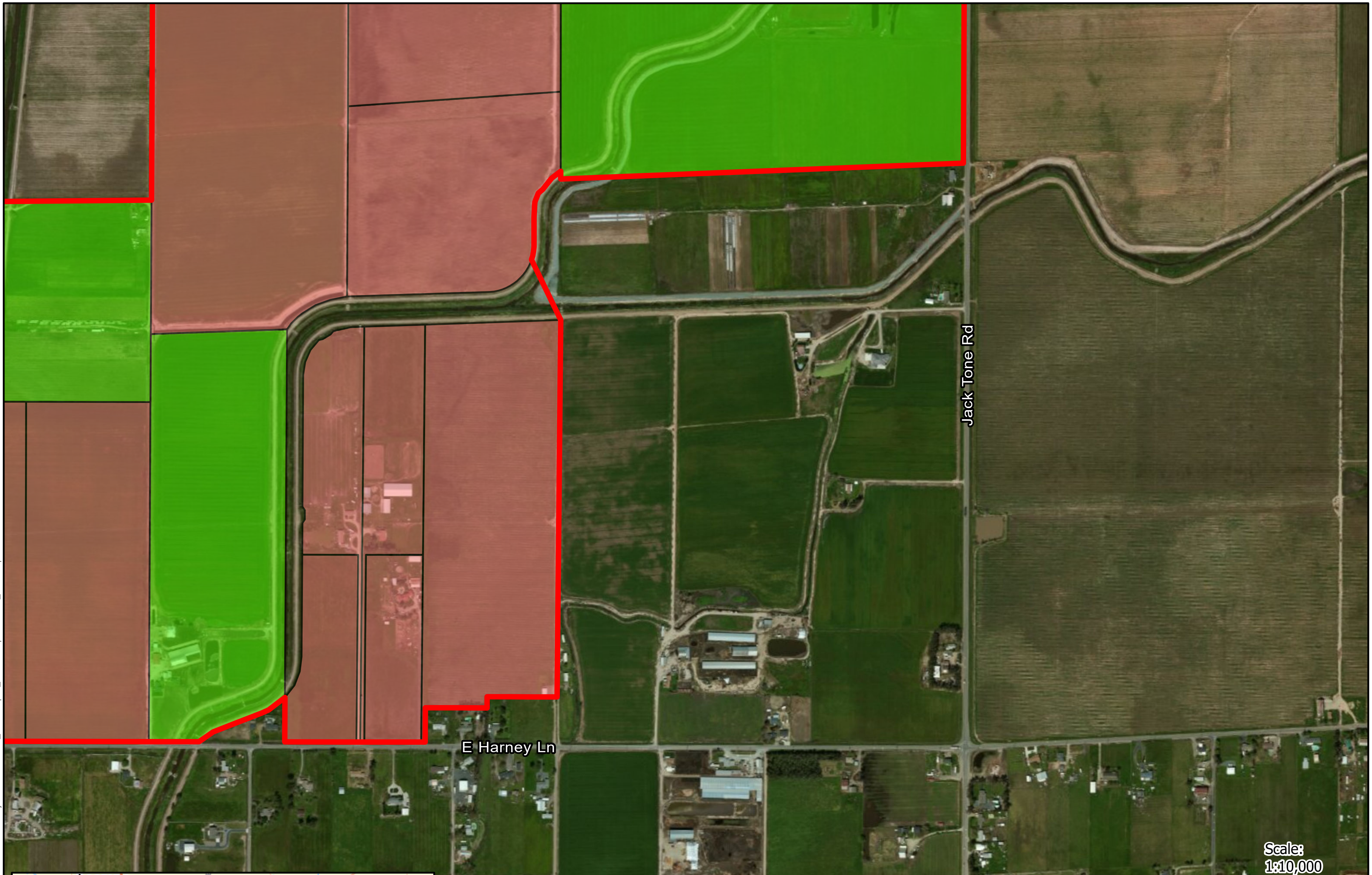
Area of Potential Impacts

Properties Meeting the Survey Cutoff Date of 1977

Properties Post-Dating the Survey Cutoff Date of 1977

FIGURE 4D
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023



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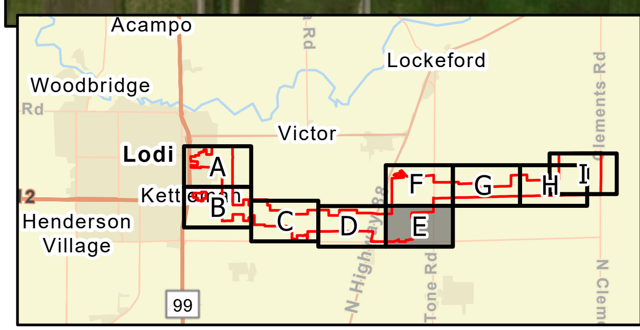


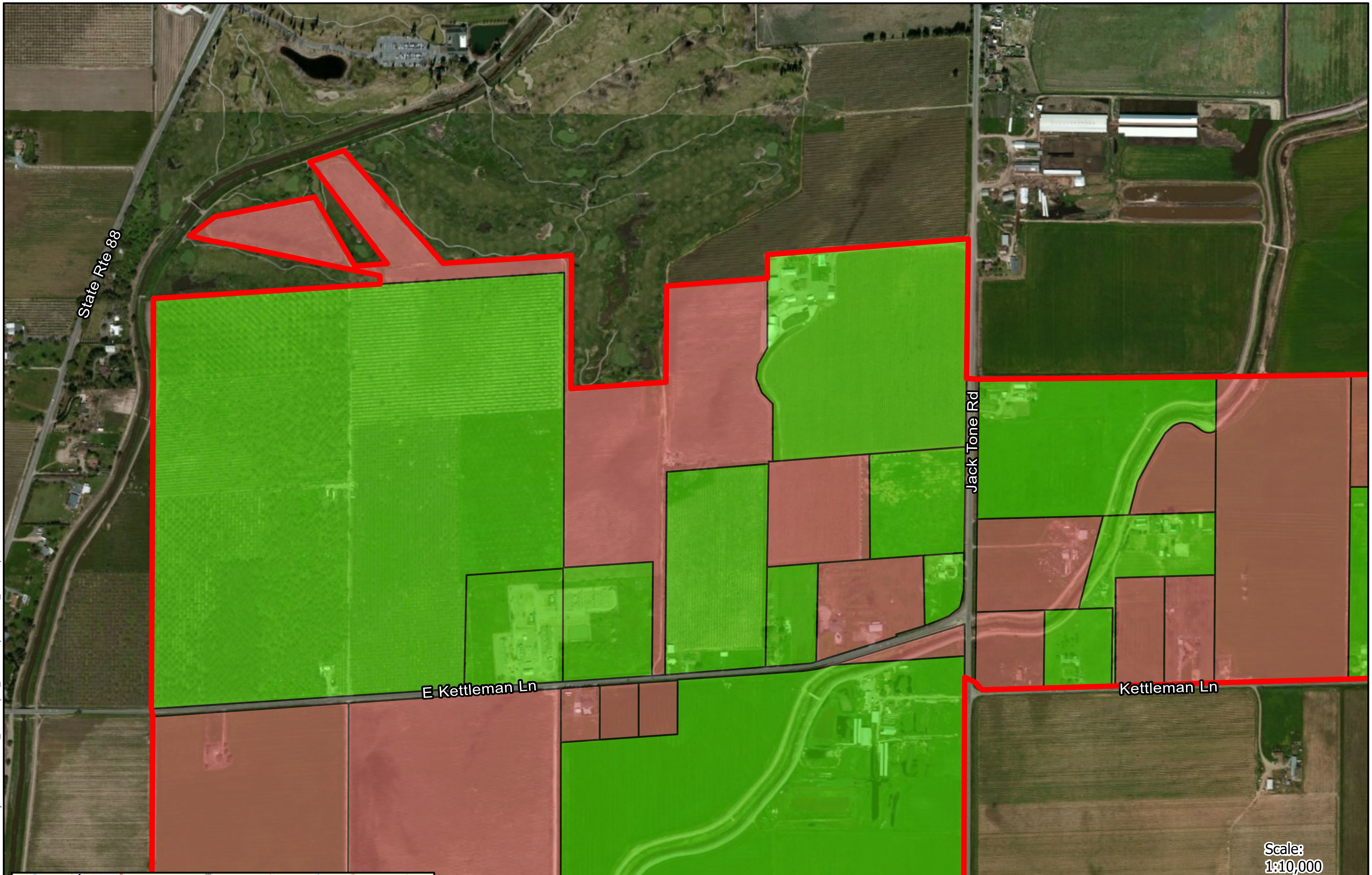
Area of Potential Impacts

Properties Meeting the Survey Cutoff Date of 1977

Properties Post-Dating the Survey Cutoff Date of 1977

0 500 1,000 Feet

FIGURE 4E
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California



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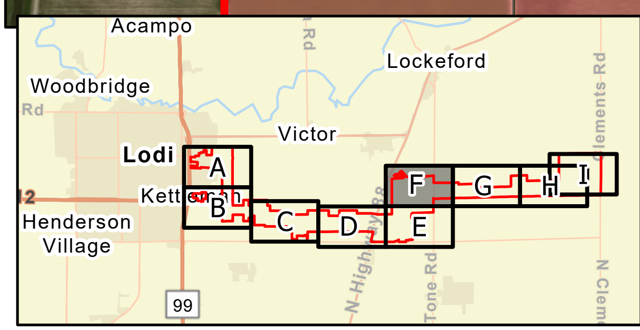


Area of Potential Impacts

Properties Meeting the Survey Cutoff Date of 1977

Properties Post-Dating the Survey Cutoff Date of 1977

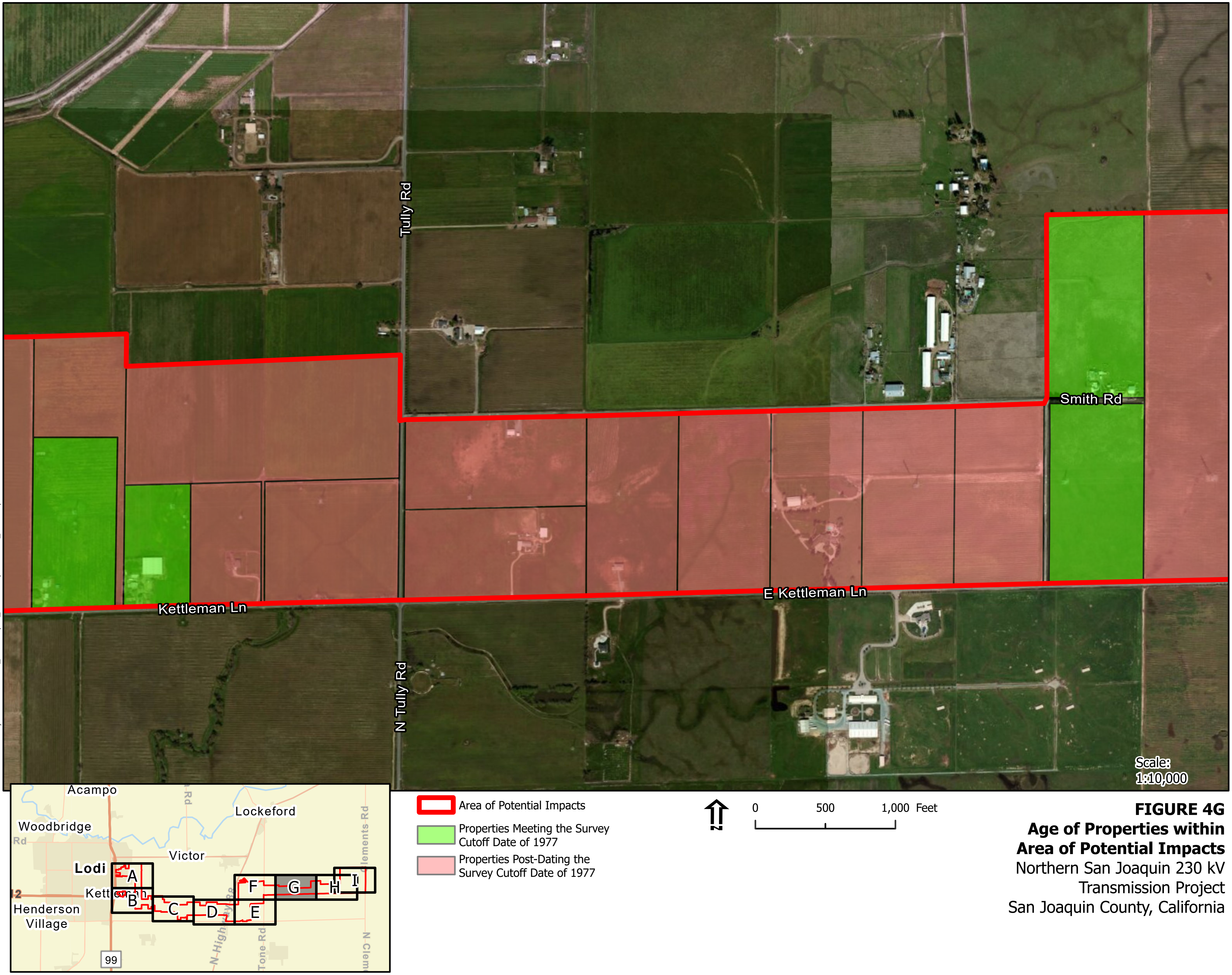
0 500 1,000 Feet

FIGURE 4F

Age of Properties within Area of Potential Impacts

Northern San Joaquin 230 kV Transmission Project

San Joaquin County, California



Area of Potential Impacts

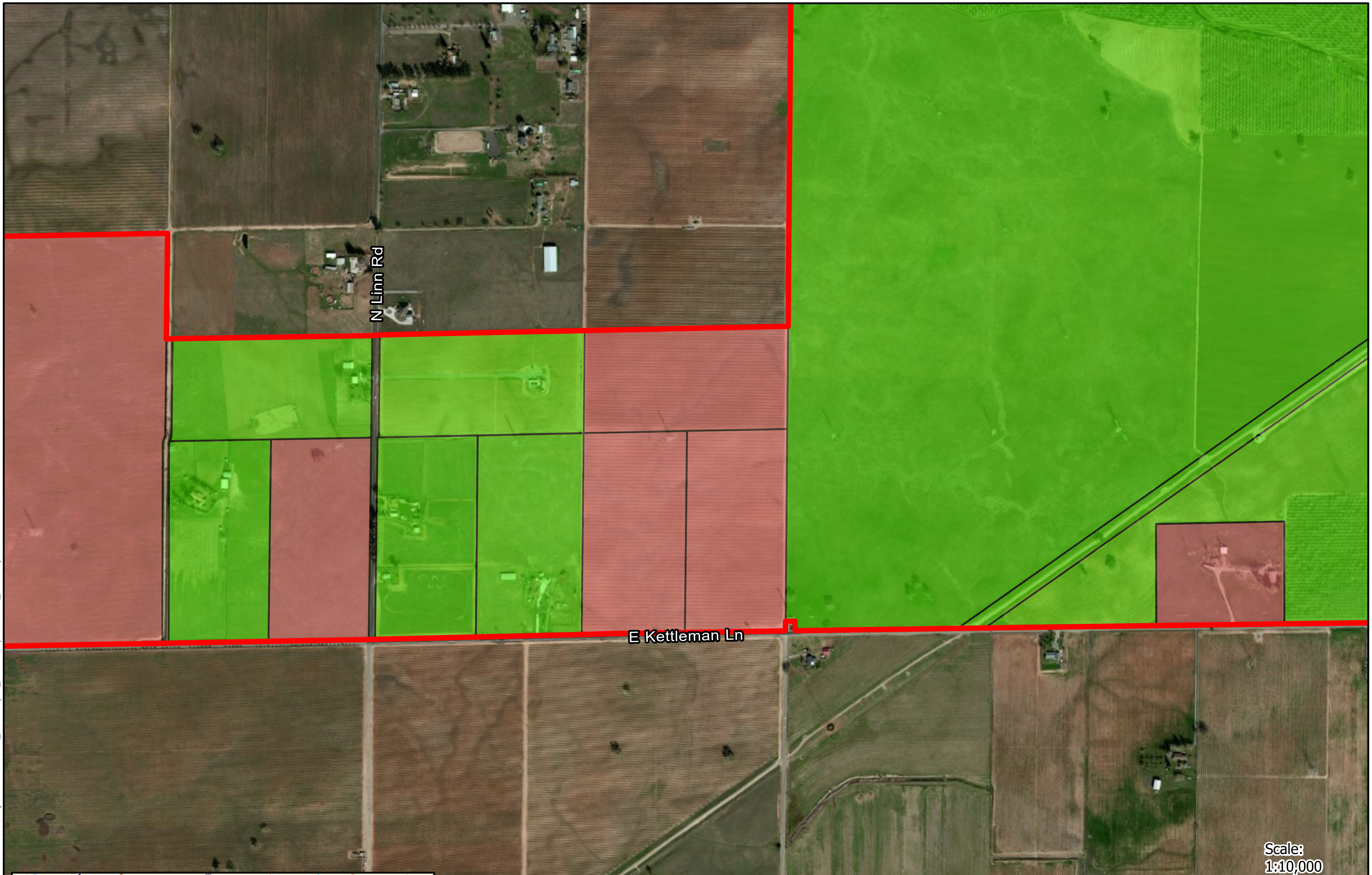
Properties Meeting the Survey Cutoff Date of 1977

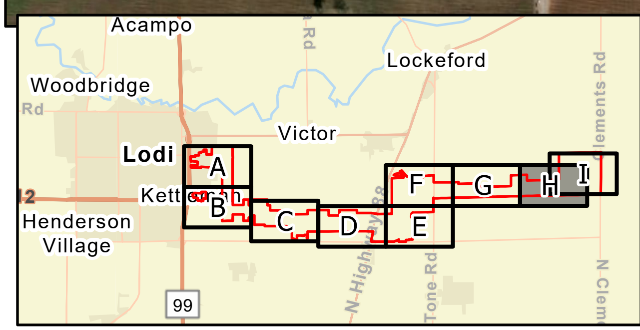
Properties Post-Dating the Survey Cutoff Date of 1977

0 500 1,000 Feet

FIGURE 4G
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

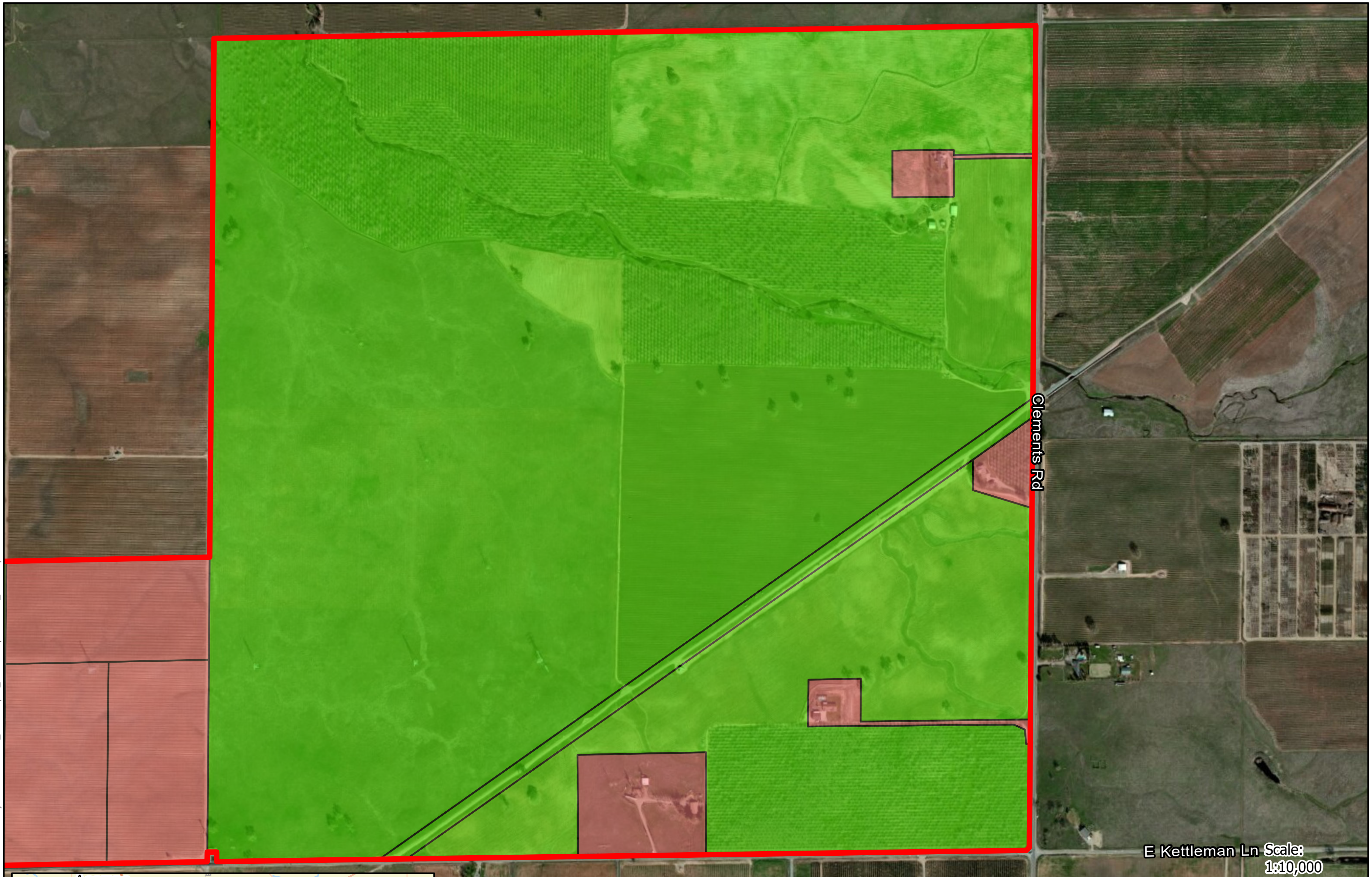
Properties Meeting the Survey Cutoff Date of 1977

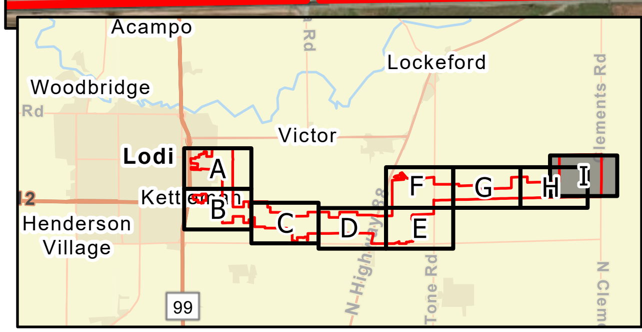
Properties Post-Dating the Survey Cutoff Date of 1977

0 500 1,000 Feet

FIGURE 4H
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

Properties Meeting the Survey Cutoff Date of 1977

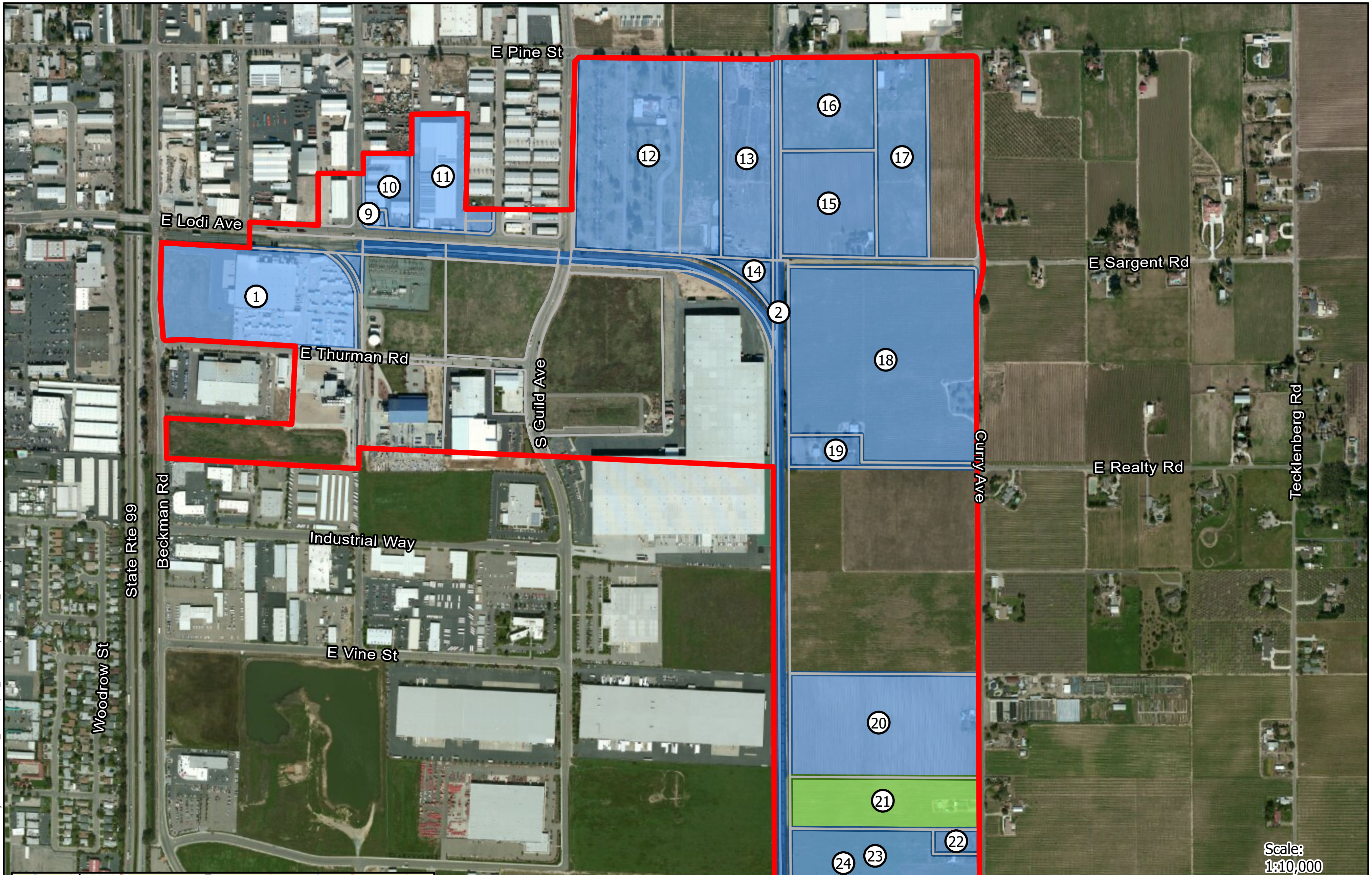
Properties Post-Dating the Survey Cutoff Date of 1977

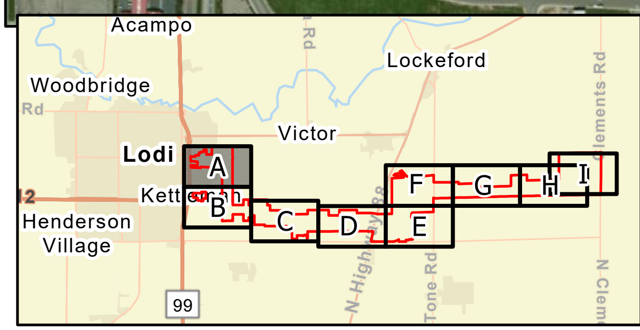
N

0 500 1,000 Feet

FIGURE 4I
Age of Properties within Area of Potential Impacts
Northern San Joaquin 230 kV Transmission Project
San Joaquin County, California

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

Not Eligible for the California Register of Historical Resources

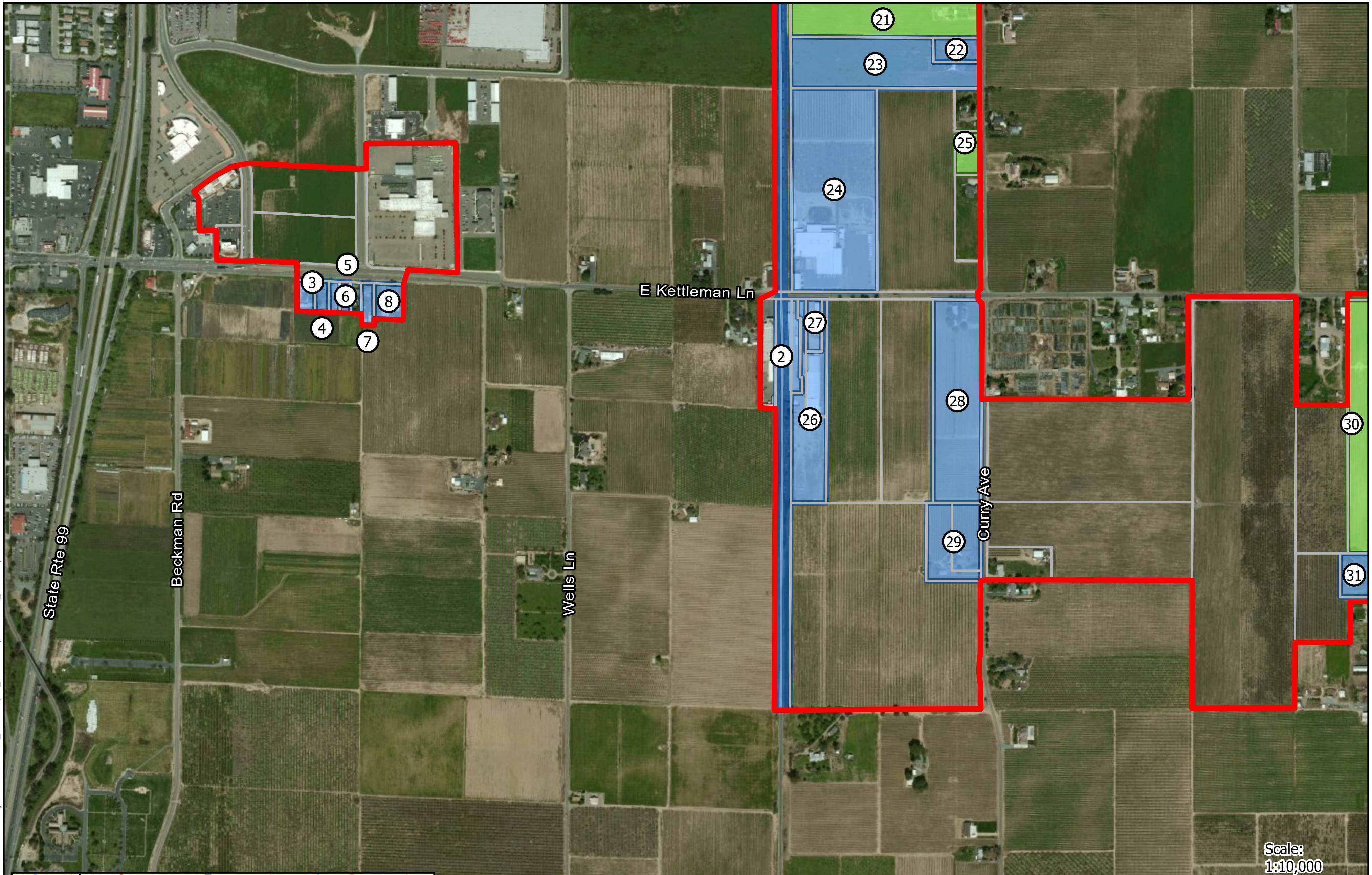
N

0 500 1,000 Feet

FIGURE 5A
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023



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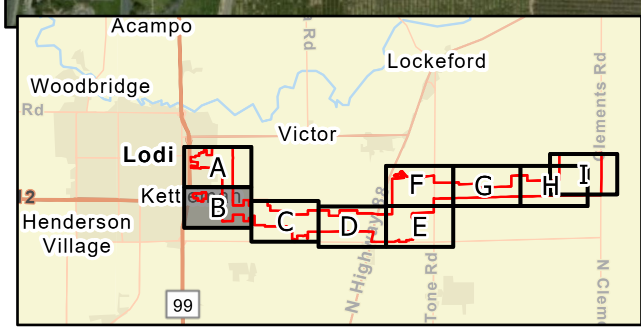


Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

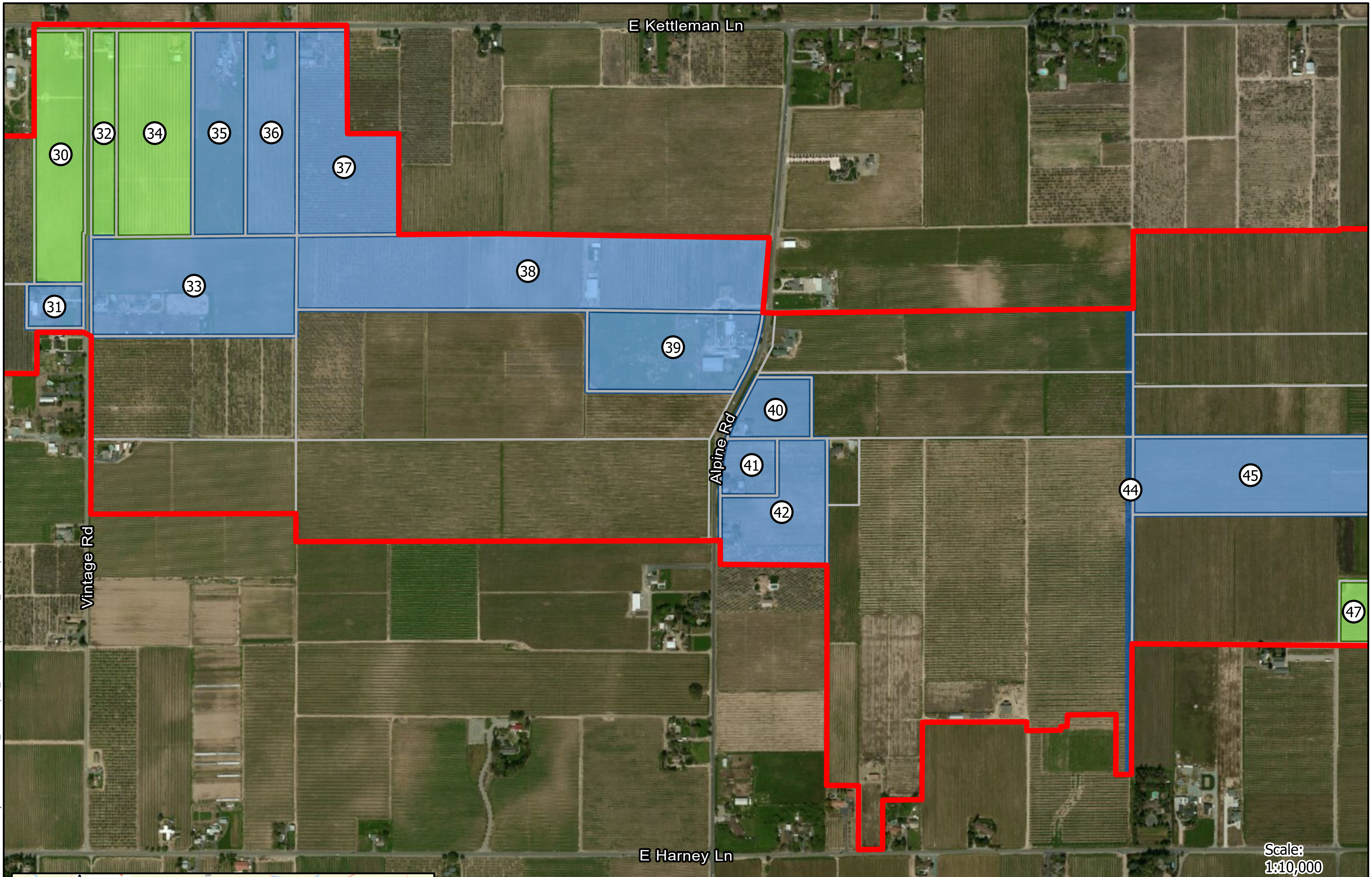
Not Eligible for the California Register of Historical Resources

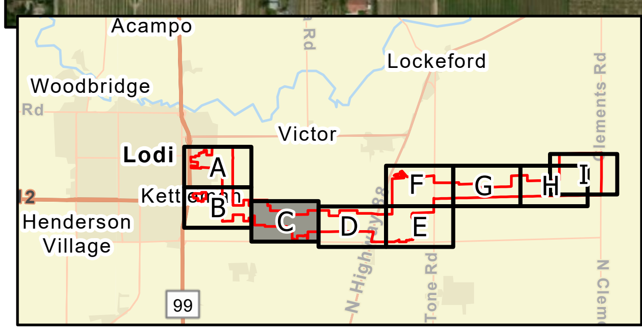
N

0 500 1,000 Feet

FIGURE 5B
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.





Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

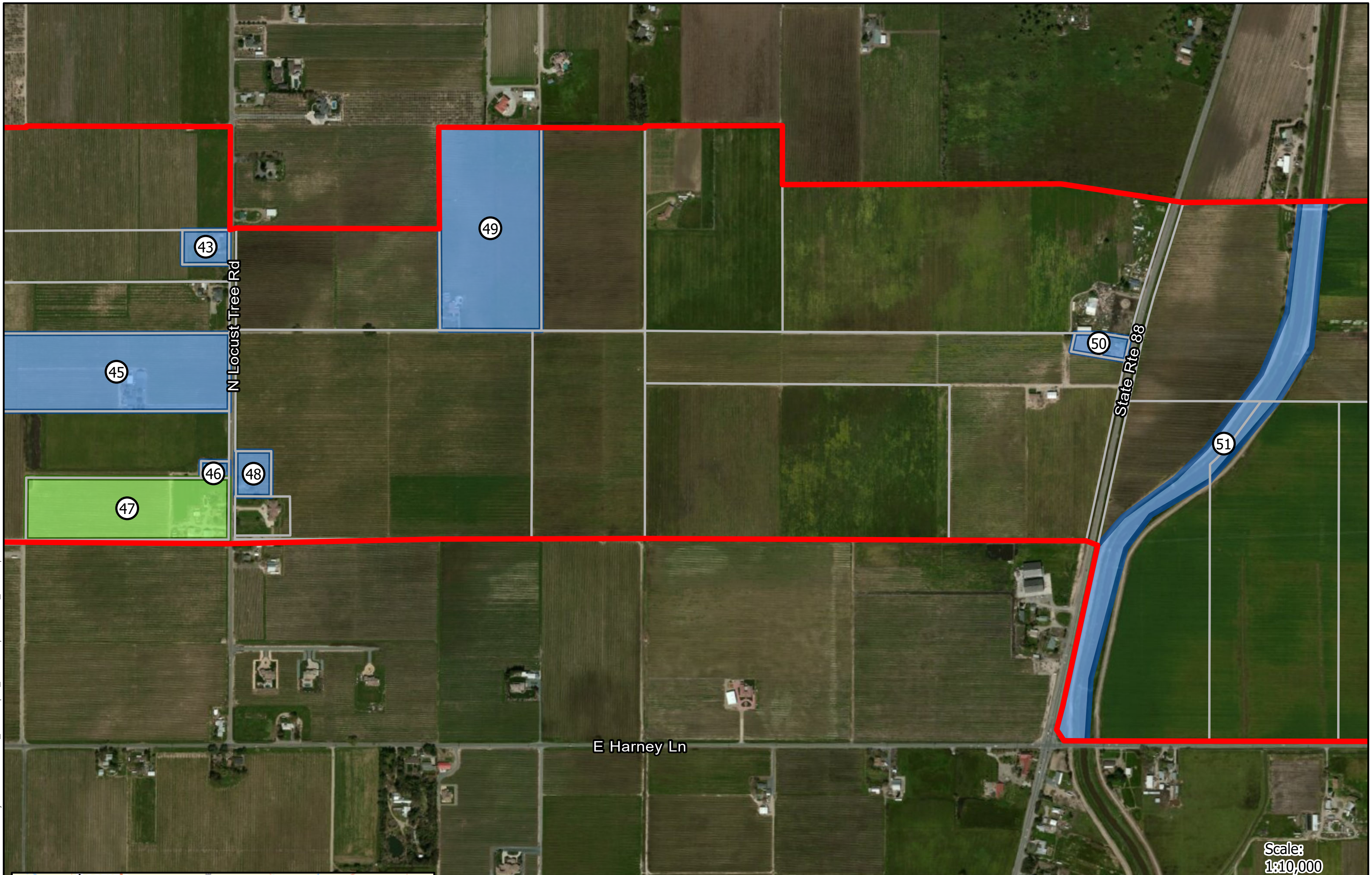
Not Eligible for the California Register of Historical Resources

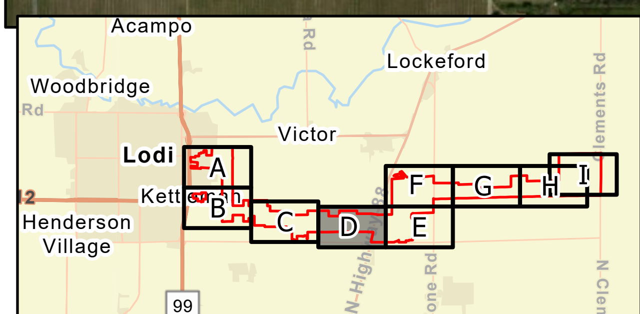
0 500 1,000 Feet

FIGURE 5C
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

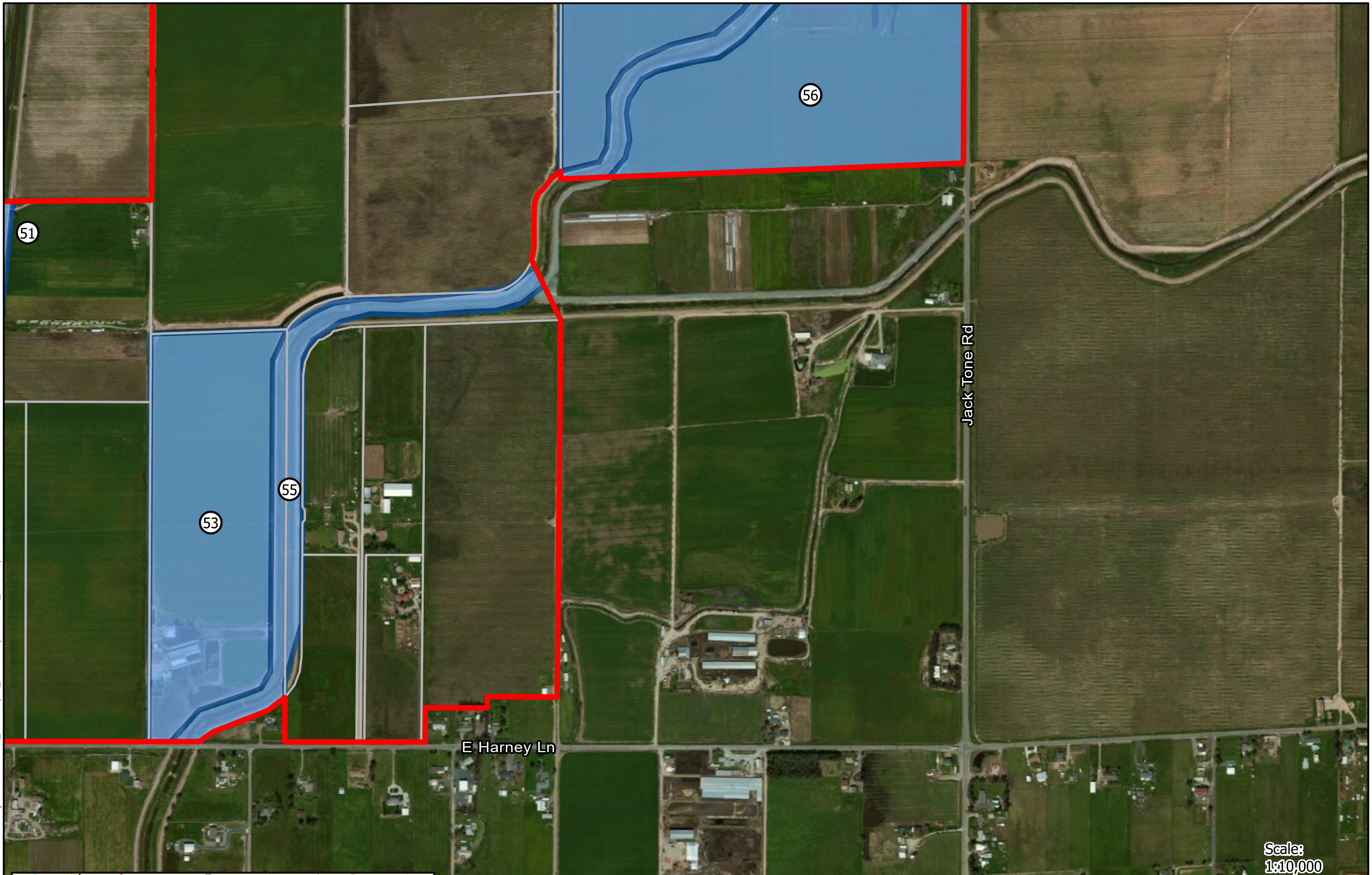
Not Eligible for the California Register of Historical Resources

0 500 1,000 Feet

FIGURE 5D
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023



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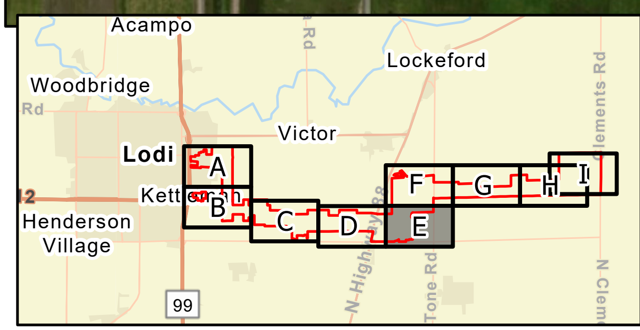


Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

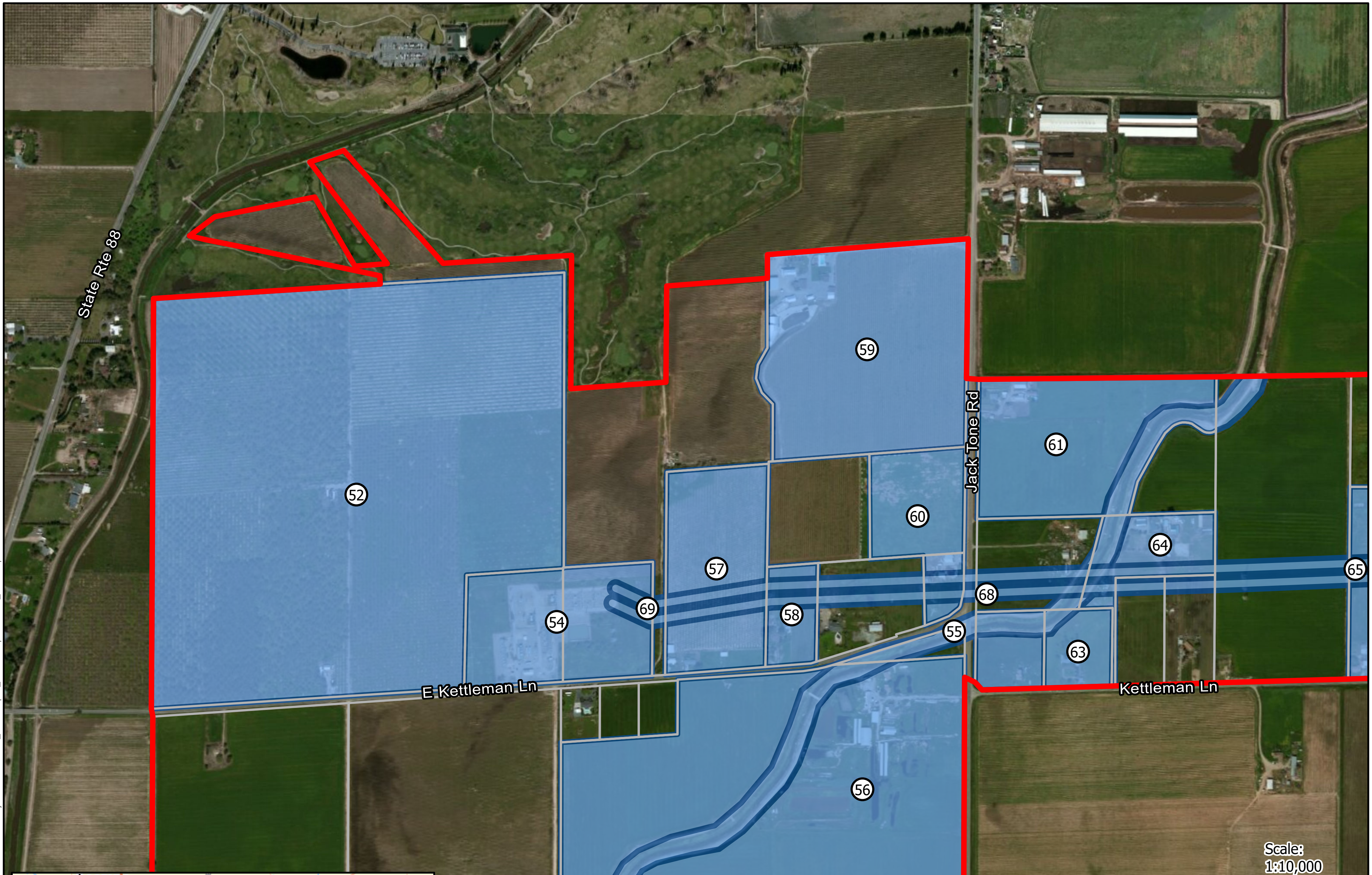
Not Eligible for the California Register of Historical Resources

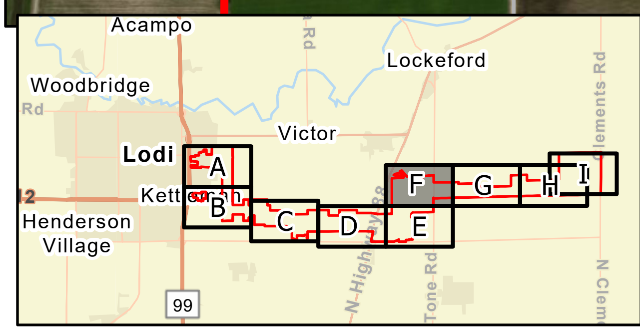
N

0 500 1,000 Feet

FIGURE 5E
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.





Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

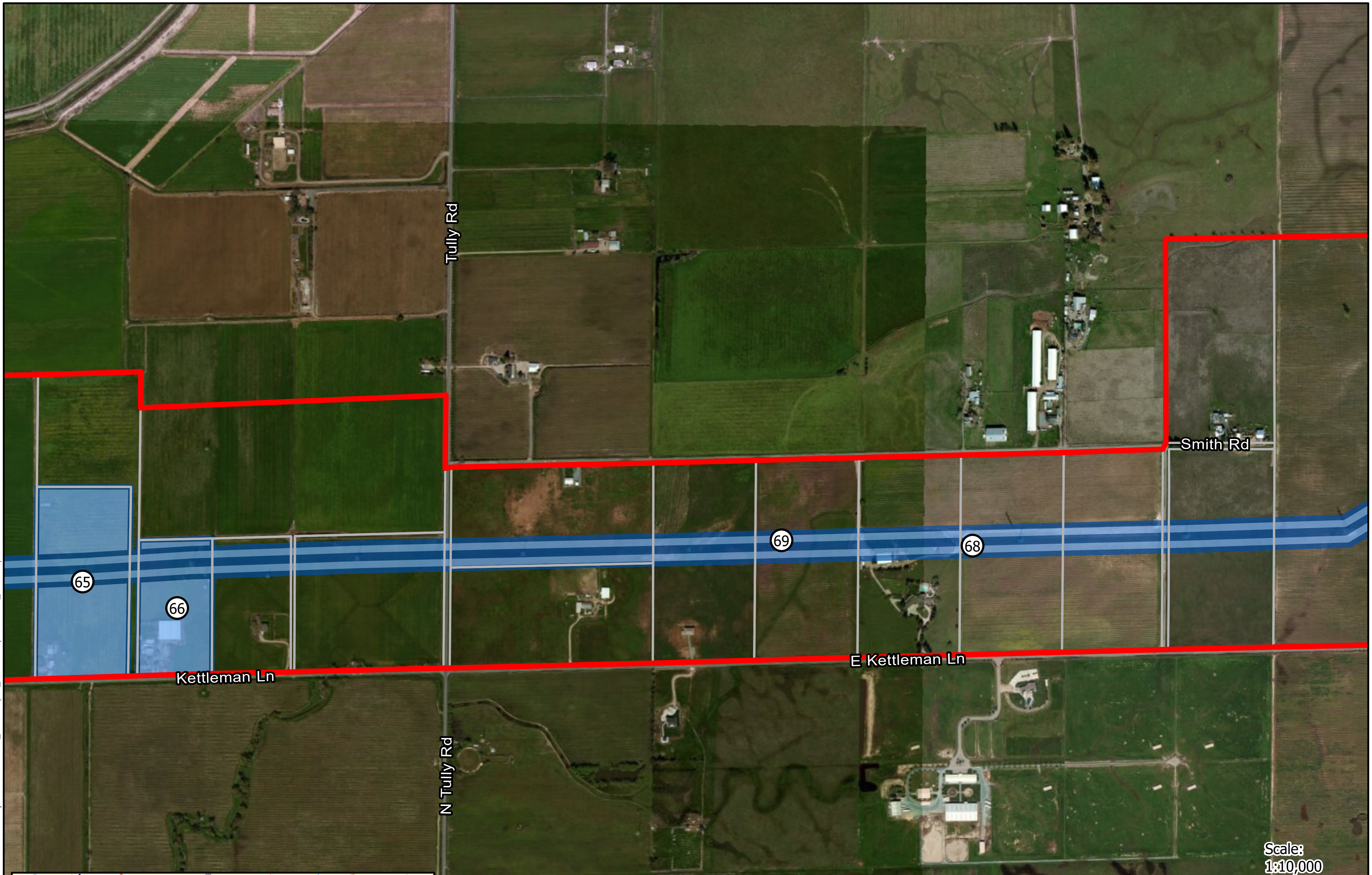
Not Eligible for the California Register of Historical Resources

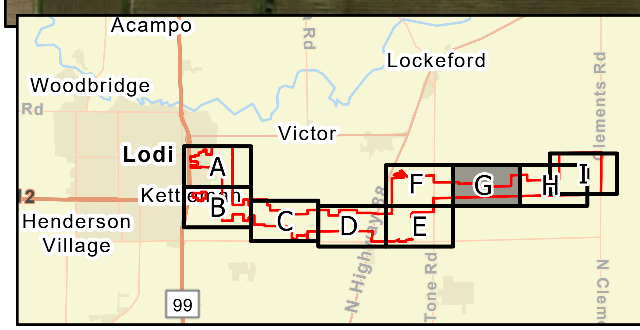
0 500 1,000 Feet

FIGURE 5F
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

\\dc1vs01\GISProj\P\PGE\Northern_SanJoaquin_230kV\MapFiles\NSJ_230kV.aprx 3/3/2023





Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

Not Eligible for the California Register of Historical Resources

0 500 1,000 Feet

FIGURE 5G
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

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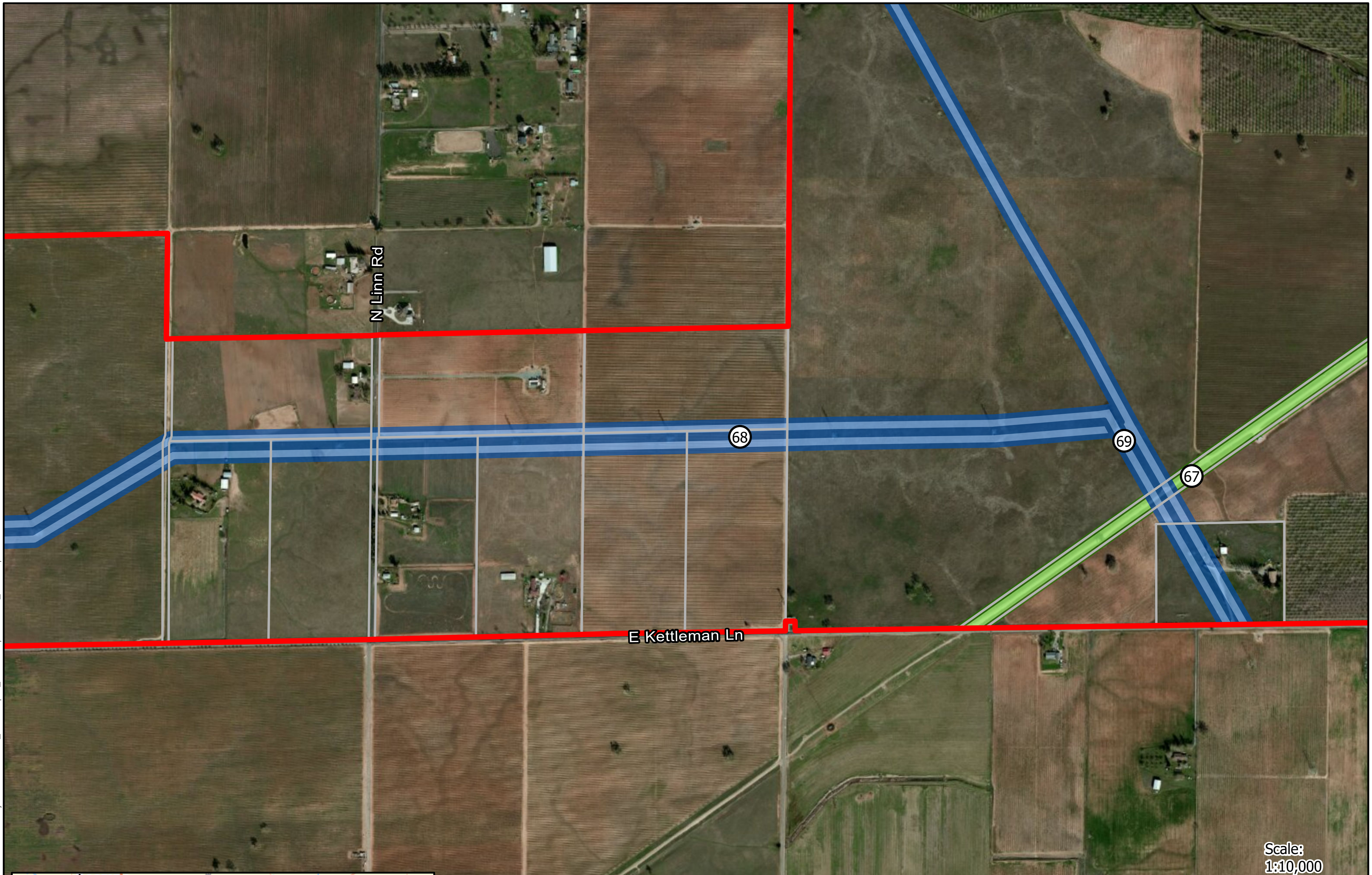

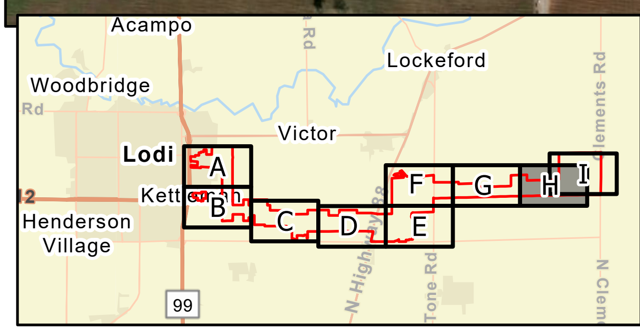

Area of Potential Impacts

Parcel Boundaries

Eligibility Determination

Eligible for the California Register of Historical Resources

Not Eligible for the California Register of Historical Resources

N

0 500 1,000 Feet

FIGURE 5H
Survey Results
Northern San Joaquin 230 kV
Transmission Project
San Joaquin County, California

Based on supplemental research following field survey, the construction date for Resource Identifier 62 was identified as 1980, constructed less than 45 years ago; therefore, the subject property has been removed from the survey population and Resource Identifier 62 is not being used.

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