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APPENDIX A

Air Quality/GHG Use Model Data Outputs for the Chico Airport Pond Sewer Repair Project, ECORP Consulting Inc., November 2025

Chico Airport Sewer Repair Project Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Chico Airport Sewer Repair Project
Construction Start Date	7/1/2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.90
Precipitation (days)	5.00
Location	39.78507548178894, -121.84593178308116
County	Butte
City	Chico
Air District	Butte County AQMD
Air Basin	Sacramento Valley
TAZ	202
EDFZ	3
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.30

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Parking Lot	698	1000sqft	11.6	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.24	29.2	29.8	0.06	1.24	19.8	21.0	1.14	10.1	11.3	—	6,761	6,761	0.28	0.06	0.76	6,787
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.40	3.44	3.90	0.01	0.14	1.07	1.21	0.13	0.48	0.61	—	801	801	0.03	0.01	0.05	805
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.63	0.71	< 0.005	0.03	0.20	0.22	0.02	0.09	0.11	—	133	133	0.01	< 0.005	0.01	133

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	3.24	29.2	29.8	0.06	1.24	19.8	21.0	1.14	10.1	11.3	—	6,761	6,761	0.28	0.06	0.76	6,787
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2026	0.40	3.44	3.90	0.01	0.14	1.07	1.21	0.13	0.48	0.61	—	801	801	0.03	0.01	0.05	805
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.07	0.63	0.71	< 0.005	0.03	0.20	0.22	0.02	0.09	0.11	—	133	133	0.01	< 0.005	0.01	133

3. Construction Emissions Details

3.1. Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.14	29.2	28.8	0.05	1.24	—	1.24	1.14	—	1.14	—	5,298	5,298	0.21	0.04	—	5,316
Dust From Material Movement	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.80	0.79	< 0.005	0.03	—	0.03	0.03	—	0.03	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.06	1.02	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	142	142	0.01	0.01	0.51	145
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.54	3.54	< 0.005	< 0.005	0.01	3.60
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.59	0.59	< 0.005	< 0.005	< 0.005	0.60
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Clearing & Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.04	27.2	27.6	0.06	1.12	—	1.12	1.03	—	1.03	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.49	1.51	< 0.005	0.06	—	0.06	0.06	—	0.06	—	362	362	0.01	< 0.005	—	363
Dust From Material Movement	—	—	—	—	—	0.50	0.50	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.27	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	59.9	59.9	< 0.005	< 0.005	—	60.1
Dust From Material Movement	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.07	1.16	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	163	163	0.01	0.01	0.58	166
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.09	8.09	< 0.005	< 0.005	0.01	8.22
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.34	1.34	< 0.005	< 0.005	< 0.005	1.36
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Trenching & Backfilling (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	11.4	14.6	0.03	0.44	—	0.44	0.40	—	0.40	—	2,639	2,639	0.11	0.02	—	2,648
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.12	1.44	< 0.005	0.04	—	0.04	0.04	—	0.04	—	260	260	0.01	< 0.005	—	261
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.20	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	43.1	43.1	< 0.005	< 0.005	—	43.2
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.07	1.16	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	163	163	0.01	0.01	0.58	166
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.5	14.5	< 0.005	< 0.005	0.04	15.1
Hauling	< 0.005	0.08	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	68.5	68.5	< 0.005	0.01	0.15	71.9
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.6	14.6	< 0.005	< 0.005	0.02	14.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.43	1.43	< 0.005	< 0.005	< 0.005	1.49
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.75	6.75	< 0.005	< 0.005	0.01	7.08
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.41	2.41	< 0.005	< 0.005	< 0.005	2.45
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.25
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.12	1.12	< 0.005	< 0.005	< 0.005	1.17

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	7/1/2026	7/14/2026	5.00	10.0	—
Clearing & Grading	Grading	7/15/2026	8/11/2026	5.00	20.0	—
Trenching & Backfilling	Building Construction	8/12/2026	9/30/2026	5.00	36.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Clearing & Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Clearing & Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Clearing & Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Clearing & Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Clearing & Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Trenching & Backfilling	Cranes	Diesel	Average	1.00	7.00	367	0.29
Trenching & Backfilling	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Trenching & Backfilling	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Trenching & Backfilling	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Trenching & Backfilling	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Trenching & Backfilling	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50
Trenching & Backfilling	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	10.3	LDA,LDT1,LDT2
Site Preparation	Vendor	—	4.50	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT

Clearing & Grading	—	—	—	—
Clearing & Grading	Worker	20.0	10.3	LDA,LDT1,LDT2
Clearing & Grading	Vendor	—	4.50	HHDT,MHDT
Clearing & Grading	Hauling	0.00	20.0	HHDT
Clearing & Grading	Onsite truck	—	—	HHDT
Trenching & Backfilling	—	—	—	—
Trenching & Backfilling	Worker	20.0	10.3	LDA,LDT1,LDT2
Trenching & Backfilling	Vendor	1.00	4.50	HHDT,MHDT
Trenching & Backfilling	Hauling	1.00	20.0	HHDT
Trenching & Backfilling	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	15.0	0.00	—
Clearing & Grading	—	—	90.0	0.00	—
Trenching & Backfilling	—	39.0	90.0	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Parking Lot	11.6	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	26.2	annual days of extreme heat
Extreme Precipitation	6.90	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	4.94	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	2	0	0	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	2	1	1	3
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	1	1	1	2
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	45.1

AQ-PM	12.2
AQ-DPM	26.1
Drinking Water	62.0
Lead Risk Housing	9.45
Pesticides	93.7
Toxic Releases	5.06
Traffic	8.79
Effect Indicators	—
CleanUp Sites	75.2
Groundwater	35.7
Haz Waste Facilities/Generators	8.76
Impaired Water Bodies	58.7
Solid Waste	63.7
Sensitive Population	—
Asthma	36.1
Cardio-vascular	26.4
Low Birth Weights	18.2
Socioeconomic Factor Indicators	—
Education	42.7
Housing	3.42
Linguistic	3.74
Poverty	22.0
Unemployment	13.2

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—

Above Poverty	80.44398819
Employed	42.62799949
Median HI	74.00230977
Education	—
Bachelor's or higher	70.42217375
High school enrollment	100
Preschool enrollment	40.40805851
Transportation	—
Auto Access	63.41588605
Active commuting	37.61067625
Social	—
2-parent households	95.13666111
Voting	86.37238547
Neighborhood	—
Alcohol availability	97.0101373
Park access	10.26562299
Retail density	4.709354549
Supermarket access	11.45900167
Tree canopy	85.60246375
Housing	—
Homeownership	84.46041319
Housing habitability	78.32670345
Low-inc homeowner severe housing cost burden	96.15039138
Low-inc renter severe housing cost burden	33.20929039
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	78.05723085
Arthritis	0.0

Asthma ER Admissions	76.4
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	57.8
Cognitively Disabled	60.3
Physically Disabled	83.0
Heart Attack ER Admissions	72.3
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	44.8
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	44.4
Elderly	40.3
English Speaking	93.3
Foreign-born	6.1

Outdoor Workers	20.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	96.1
Traffic Density	3.0
Traffic Access	0.0
Other Indices	—
Hardship	18.3
Other Decision Support	—
2016 Voting	79.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	14.0
Healthy Places Index Score for Project Location (b)	72.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	SF of site calculate from doubling footprint of new pipe (349*2=698) to account for the construction of manhole and road.
Construction: Construction Phases	Construction phasing updated to match the PD.
Construction: Off-Road Equipment	Plate compactor and trencher added due to nature of Project
Construction: Dust From Material Movement	Material exported is half of pipe footprint (349/2=175) with a 6 foot depth assumed.
Construction: Trips and VMT	Worker trips for building construction updated to 20 as caleemod defaulted to 0. Assumed 1 haling trips per day as a HHDT can accommodate up to 20 cubic yards of soil. 1 vendor trip added to account for delivery of material as caleemod default to 0.

APPENDIX B

Biological Resources Assessment for the Chico Airport Pond Sewer Repair Project, ECORP Consulting Inc., November 2025

Biological Resources Assessment
for the
Chico Airport Pond Sewer Repair Project

City of Chico, Butte County, California

Prepared For:

Bennett Engineering Services
1082 Sunrise Avenue, Suite 100
Roseville, CA 95661

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
2525 Warren Drive Rocklin,
California 95677

November 3, 2025

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Term	Definition
BCC	Birds of Conservation Concern
BIOS	Biogeographic Information and Observation System
BRA	Biological Resources Assessment
BSA	Biological Study Area
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Ranks
CWA	Clean Water Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
GPS	Global Positioning System
HCP	Habitat Conservation Plan
LSAA	Lake or Streambed Alteration Agreement
MBTA	Migratory Bird Treaty Act
MCV	*Manual of California Vegetation Online*
MSL	mean sea level
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SSC	Species of Special Concern
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
WBWG	Western Bat Working Group
WL	Watch List

1.0 INTRODUCTION

ECORP Consulting, Inc. has conducted a Biological Resources Assessment (BRA) at the request of Bennett Engineering, for the proposed Chico Airport Pond Sewer Repair Project (Project) located in Chico, Butte County, California. The results of this assessment will support environmental review of the Project in accordance with the California Environmental Quality Act (CEQA) and provide the basis for identifying appropriate measures to lessen or avoid significant impacts to biological resources.

1.1 Project Location and Description

The Proposed Project is located at the south end of the Chico Airport Pond Sewer/wastewater overflow pond on a parcel of land identified as Assessor's Parcel Number 047-550-001. The approximately 11.85 –acre Biological Study Area (BSA) is bisected by an aquatic feature called Sheep Hollow and is located off Cohasset Avenue in Chico, California, just south of the Chico Regional Airport (Figure 1).

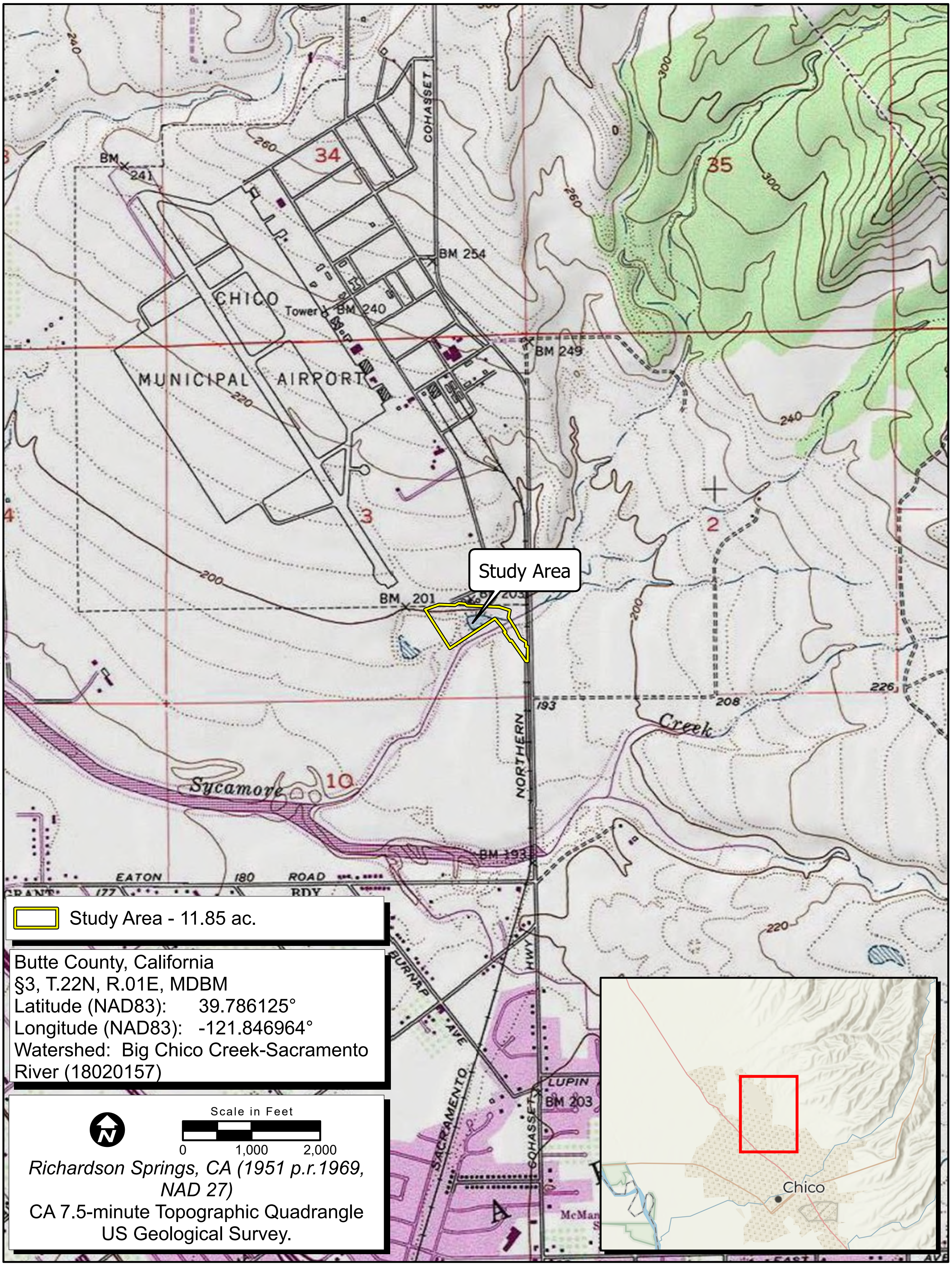
The City of Chico proposes to make improvements to the Chico Airport sewer system to address deficiencies in the system. To reduce the volume of stormwater from entering the nearby pond, the Project proposes to abandon ±510 feet of existing storm drain line segments and install a new storm drain line that would outfall stormwater into the existing unnamed drainage channel. The installation of the new storm drain line would reestablish the storm water diversion to the unnamed drainage channel, rather than passing through the pond.

The installation of the new storm drain line would include a 12-inch, ±349-foot high-density polyethylene (HDPE) storm drain line. The proposed new storm drain line would connect the existing drainage inlet to a storm drain outlet into the existing unnamed drainage channel that drains into Sheep Hollow Creek. The outfall elevation of the proposed storm drainage pipe is set above the OHWM.

To install the proposed storm drainpipe traversing from the existing drainage inlet to the drainage channel, the vegetation along the proposed alignment would be cleared and properly disposed of offsite. Following clear and grub, a trench measuring approximately 7 feet wide at depth would be dug. The storm drainpipe would then be placed and backfilled, and soils compacted. The pipe would then be pressure tested. Following successful pressure testing, the ground surface would be restored to pre-Project grades.

A construction staging area for the installation of the proposed storm drainpipe would be established just east of the unnamed ephemeral drainage where materials, equipment, and tools will be temporarily stored. Access to the Project area will be accessed off the entrance driveway, mainly utilized for access to the City of Chico Compost Facility at 4441 Cohasset Road. Temporary signage will be placed where construction vehicles will enter and leave the public right-of-way (ROW) to notify the public of the approaching work zone and the potential for construction vehicles and controlled traffic conditions.

The Project proposes to replace an existing plug valve with a 12-inch gate valve and install a level sensor in the existing junction box, along the existing alignment of the 12-inch sanitary sewer pipe main, located north of Sheep Hollow Creek. Installation of the proposed sewer pipe infrastructure will be limited to accessing the existing buried junction box and will not include significant ground-disturbing excavation.



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Location_Vicinity\CASRP LnV.aprx - CASRP LnV 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-138.02A Chico Airport Pond Sewer Repair Project

The proposed installation of infrastructure will support the efficiency of the sanitary sewer system by monitoring and controlling the flow of wastewater to avoid overflow and spills.

The Project proposes a new sewer manhole to be installed within the alignment of the existing 12-inch sewer main. The proposed location of the manhole will be approximately 150-200 feet south of the existing Federal levee, on the south side of Sheep Hollow Creek, and will avoid encroachment of the levee easement limits. The manhole will be installed to allow for maintenance access to the existing sewer siphon system.

Installation of the proposed manhole would include clear and grub at the proposed location, south of the Federal levee. Following clear and grub, excavation to reach the required depth of the 12-inch sewer pipeline will occur to allow for proper placement of the new concrete manhole

To access the proposed manhole, a 15-foot access road is proposed to be constructed over the alignment of the existing 12-inch sewer main on the southerly side of the levee. The proposed access road will be accessed from Cohasset Road, through construction of an independent driveway to service the access road. The access road will be graded down to a slope of 2H:1V and surfaced with crushed rock along the length of the route. A turnaround will be constructed at the end of the access road, ensuring a buffer from the Federal levee easement limits.

A construction staging area for the installation of the proposed sewer pipe manhole and access road would be established just west of the existing Federal levee entrance driveway off Cohasset Road. The staging area will be the site where materials, equipment, and tools will be temporarily stored. Refueling, lubrication, or maintenance of construction vehicles will only be permitted within the construction staging area. Temporary signage will be placed where construction vehicles will enter and leave the public ROW to notify the public of the approaching work zone and the potential for construction vehicles and controlled traffic conditions. Should Project construction require activity within a public ROW or easement, an encroachment permit would be obtained.

1.2 Biological Study Area

The BSA includes all areas where Project-related activities may result in impacts to sensitive biological resources. The 11.85-acre BSA corresponds to a portion of Section 3, Township 22 North, and Range 1 east (Mount Diablo Base and Meridian) of the "Richardson Springs, California" 7.5-minute quadrangle (U.S. Geological Survey 2024, Figure 1). The approximate center of the BSA is located at 39.7905104° North and 121.8533985° West within the Big Chico Creek-Sacramento River watershed (Hydrological Unit Code 18020157, Natural Resources Conservation Service [NRCS] et al., 2016).

1.3 Purpose of this Biological Resources Assessment

The purpose of this BRA is to assess the potential for occurrence of special-status plant and animal species or their habitats, and other sensitive or protected resources such as migratory birds, sensitive natural communities, riparian habitat, oak woodlands, and potential Waters of the U.S. or state, including wetlands, within the BSA. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in this report are based upon a review of available literature and the results of planning-level and site reconnaissance field surveys.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California ESA;
- meet the definitions of endangered or rare under Section 15380 of the CEQA Guidelines;
- are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- are birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" or "rare, threatened, or endangered in California but more common elsewhere" (California Rare Plant Ranks [CRPR] 1 and 2);
- are plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the USFWS or the National Marine Fisheries Service (NMFS). Section 9 of the ESA prohibits the taking of listed wildlife, where take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, the ESA prohibits removing or possessing any listed plant on federal land, maliciously damaging or destroying any listed plant in any area, or removing, cutting, digging up, damaging, or destroying any such species in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its designated Critical Habitat. Through consultation and the issuance of a Biological Opinion, the USFWS may issue an incidental take statement allowing take of a listed species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a Habitat Conservation Plan (HCP) is developed.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The protections of the MBTA extend to disturbances that result in abandonment of a nest with eggs or young. The USFWS may issue permits to qualified applicants as authorized by the MBTA for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits.

2.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22]. The USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

2.1.4 Magnuson-Stevens Act

Essential Fish Habitat (EFH) was defined by the U.S. Congress in the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, or Magnuson-Stevens Act, as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." Implementing regulations clarified that waters include all aquatic areas and their physical, chemical, and biological properties; substrate includes the associated biological communities that make these areas suitable for fish habitats, and the description and identification of EFH should include habitats used at any time during the species' life cycle. EFH includes all types of aquatic habitat, such as wetlands, coral reefs, sand, seagrasses, and rivers.

2.1.5 Federal Clean Water Act

The purpose of the federal Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Section 404 of the CWA prohibits the discharge of dredged or fill material into Waters of the U.S. without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas:

> “…that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a

prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b).

The U.S. Environmental Protection Agency also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

2.2 State or Local Regulations

2.2.1 California Fish and Game Code

2.2.1.1 California Endangered Species Act

The California ESA (California Fish and Game Code Sections 2050-2116) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called *candidates* by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. *Take* is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Section 2081 allows CDFW to authorize incidental take permits if species-specific minimization and avoidance measures are incorporated to fully mitigate the impacts of the project.

2.2.1.2 Fully Protected Species

The State of California first began to designate species as *fully protected* prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the state and/or federal ESAs. Previously, the regulations that implement the Fully Protected Species Statute (California Fish and Game Code Sections 4700 for mammals, 3511 for birds, 5050 for reptiles and amphibians, and 5515 for fish) provided that fully protected species may not be taken or possessed at any time. However, on July 10, 2023, Senate Bill 147 was signed into law, authorizing CDFW to issue take permits under the California ESA for fully protected species for qualifying projects through 2033. Qualifying projects include:

- a maintenance, repair, or improvement project to the State Water Project, including existing infrastructure, undertaken by the Department of Water Resources;
- a maintenance, repair, or improvement project to critical regional or local water agency infrastructure;

- a transportation project, including any associated habitat connectivity and wildlife crossing project, undertaken by a state, regional, or local agency, that does not increase highway or street capacity for automobile or truck travel;
- a wind project and any appurtenant infrastructure improvement, and any associated electric transmission project carrying electric power from a facility that is located in the State to a point of junction with any California based balancing authority; or
- a solar photovoltaic project and any appurtenant infrastructure improvement, and any associated electric transmission project carrying electric power from a facility that is located in the State to a point of junction with any California-based balancing authority.

CDFW may also issue licenses or permits for take of these species for necessary scientific research or live capture and relocation, and may allow incidental take for lawful activities carried out under an approved Natural Community Conservation Plan within which such species are covered.

2.2.1.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 was created with the intent to “preserve, protect and enhance rare and endangered plants in this State.” The NPPA is administered by CDFW and provided in California Fish and Game Code Sections 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as *endangered* or *rare* and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code Sections 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

2.2.1.4 California Fish and Game Code Special Protections for Birds

Sections 3503, 3513, and 3800 of the California Fish and Game Code specifically protect birds. Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Subsection 3503.5 prohibits the take, possession, or destruction of any birds in the orders Strigiformes (owls) or Falconiformes (hawks and eagles), as well as their nests and eggs. Section 3513 prohibits the take or possession of any migratory nongame bird as designated in the MBTA. Section 3800 states that, with limited exceptions, it is unlawful to take any nongame bird, defined as all birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds. These provisions, along with the federal MBTA, serve to protect all nongame birds and their nests and eggs, except as otherwise provided in the code.

2.2.1.5 Lake or Streambed Alteration Agreements

Section 1602 of the California Fish and Game Code requires that a Notification of Lake or Streambed Alteration be submitted to CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” The notification must incorporate proposed measures to protect affected fish and wildlife resources. CDFW may suggest additional protective measures during their review. A Lake or Streambed Alteration Agreement (LSAA) is the final proposal mutually agreed upon by CDFW and the applicant. Projects that require an LSAA often also require a permit from the USACE under Section 404 of the CWA. The conditions of the Section 404 permit and the LSAA frequently overlap in these instances.

2.2.2 California Oak Woodlands Conservation Act

The California Oak Woodlands Conservation Act was passed in 2001 to address loss of oak woodland habitats throughout the State. As a result of the Act, the Oak Woodland Conservation Program was established to provide funding for conservation and protection of California oak woodlands. Public Resources Code Section 21083.4 went into effect as of January 1, 2005 and requires lead agencies to analyze potential effects to oak woodlands during the CEQA process. The lead agency must implement one of several mitigation alternatives, including conservation of oak woodlands through conservation easements, planting or restoration of oak woodlands, contribution of funds to the Oak Woodlands Conservation Fund, or other appropriate mitigation measures if it is determined that a project may have a significant effect on oak woodlands.

2.2.3 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of storm water runoff associated with construction activities. General Construction Permits for projects that disturb 1 or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB also regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by the USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of Waste Discharge Requirements for these activities.

2.2.4 California Environmental Quality Act

Per CEQA Guidelines Section 15380, a species not protected on a federal or state list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in the federal and California ESAs, and Sections 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the CEQA Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW.

2.2.4.1 CEQA Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant. Generally, impacts to listed (i.e., rare, threatened, or endangered) species are considered significant. Assessment of *impact significance* to populations of non-listed species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Pursuant to Appendix G, impacts to biological resources would normally be considered significant if the project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected Waters of the U.S. including wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA because although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.2.4.2 Species of Special Concern

Species of Special Concern (SSC) are defined by the CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under the ESA, the California ESA or the California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the State or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role.

- The species is listed as federally (but not State) threatened or endangered, and meets the state definition of threatened or endangered but has not formally been listed.
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status.
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for state threatened or endangered status.

SSC are typically associated with threatened habitats. Projects that result in substantial impacts to SSC may be considered significant under CEQA.

2.2.4.3 USFWS Bird of Conservation Concern

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under ESA." To meet this requirement, the USFWS published a list of BCC (USFWS 2021) for the U.S. The list identifies the migratory and nonmigratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS' highest conservation priorities. Depending on the policy of the lead agency, projects that result in substantial impacts to BCC may be considered significant under CEQA.

2.2.4.4 California Rare Plant Ranks

The CNPS maintains the *Rare Plant Inventory* (CNPS 2024a), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academic, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed
- Rare Plant Rank 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 0.1 through 0.3, with 0.1 being the most threatened and 0.3 being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

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

Factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection (CNPS 2024b). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, 2A, or 2B are typically considered significant under CEQA Guidelines Section 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

2.2.4.5 Sensitive Natural Communities

Sensitive natural communities are vegetation communities that are imperiled or vulnerable to environmental effects of projects. CDFW maintains the California Natural Community List (CDFW 2023), which provides a list of vegetation alliances, associations, and special stands as defined in *A Manual of California Vegetation Online* (MCV; CNPS 2024b), along with their respective state and global rarity ranks, if applicable. Natural communities with a state rarity rank of S1, S2, or S3 are considered sensitive natural communities. Depending on the policy of the lead agency, impacts to sensitive natural communities may be considered significant under CEQA.

2.2.4.6 Wildlife Movement Corridors and Nursery Sites

Impacts to wildlife movement corridors or nursery sites may be considered significant under CEQA. As part of the California Essential Habitat Connectivity Project, CDFW and California Department of Transportation (Caltrans) maintain data on Essential Habitat Connectivity areas. This data is available in the CNDDB. The goal of this project is to map large intact habitat or natural landscapes and potential linkages that could provide corridors for wildlife. In urban settings, riparian vegetated stream corridors can also serve as wildlife movement corridors. Nursery sites include but are not limited to concentrations of nest or den sites such as heron rookeries, bat maternity roosts, and mule deer critical fawning areas. These data are available through CDFW’s Biogeographic Information and Observation System (BIOS, CDFW 2024a) database or as occurrence records in the CNDDB and are supplemented with the results of the field reconnaissance.

3.0 METHODS

3.1 Literature Review

ECORP biologists performed a review of existing available information for the BSA. Literature sources included current and historical aerial imagery, any previous biological studies conducted for the area, topographic mapping, soil survey mapping available from the NRCS *Web Soil Survey*, USFWS National Wetlands Inventory (NWI) mapping, USFWS Critical Habitat Mapper, NMFS Essential Fish Habitat Mapper, and other relevant literature as cited throughout this document. ECORP reviewed the following resources to identify special-status plant and wildlife species that have been documented in or near the BSA:

- CDFW's CNDDB data for the "Richardson Springs, California" 7.5-minute quadrangle and the surrounding eight quadrangles (CDFW 2024b);
- CNPS Rare Plant Inventory data for the " Richardson Springs, California" 7.5-minute quadrangle and the surrounding eight quadrangles (CNPS 2024a);
- USFWS Information for Planning and Consultation Resource Report List for the BSA (USFWS 2024);
- NMFS Resources data for the "Richardson Springs, California" 7.5-minute quadrangle (National Oceanic and Atmospheric Administration [NOAA] 2016).

The results of the database queries are provided in Appendix A. Each special-status species identified in the literature review is evaluated for its potential to occur in the BSA in Section 4 based on available information concerning species habitat requirements and distribution, occurrence data, and the findings of the site reconnaissance.

3.2 Site Reconnaissance

ECORP Biologist Aly Johnson conducted the site reconnaissance visit on May 6, 2024. The biologist visually assessed the BSA while walking meandering transects through all portions of the site, using binoculars to scan inaccessible areas. The biologist(s) collected the following biological resource information:

- Characteristics and approximate boundaries of vegetation communities and other land cover types;
- Plant and animal species or their sign directly observed;
- Characteristics and approximate extents of potential aquatic resources observed; and
- Incidental observations of special habitat features such as burrows, active raptor nests, potential bat roost sites.

The biologists qualitatively assessed and mapped vegetation communities based on dominant plant composition. Vegetation community classification was based on the classification systems presented in the Manual of California Vegetation (MCV), paying special attention to identifying those portions of the BSA with the potential to support special-status species or sensitive habitats. Data were recorded on a Global Positioning System (GPS) unit, field notebooks, and/or maps. Photographs were taken during the survey to provide visual representation of the conditions within the BSA.

3.3 Special-Status Plant Survey

ECORP Senior biologist Hannah Stone conducted a special-status plant survey within the Study Area on April 19, 2024. The survey was conducted in accordance with guidelines promulgated by USFWS (USFWS 2000), CDFW (CDFW 2009), and CNPS (CNPS 2001). The survey coincided with the optimum identifiable periods for each of the following target species:

- depauperate milk-vetch (*Astragalus pauperculus)*
- big-scale balsamroot (*Balsamorhiza macrolepis)*
- Butte County calycadenia (*Calycadenia oppositifolia)*
- spicate calycadenia (*Calycadenia spicata)*
- silky cryptantha (*Cryptantha crinite)*
- dwarf downingia (*Downingia pusilla)*
- adobe-lily (*Fritillaria pluriflora)*
- Butte County meadowfoam (*Limnanthes floccosa ssp. Californica)*
- woolly meadowfoam (*Limnanthes floccosa ssp. floccose)*
- veiny monardella (*Monardella venosa)*
- Tehama navarretia (*Navarretia heterandra)*
- Ahart's paronychia (*Paronychia ahartii)*
- Bidwell's knotweed *(Polygonum bidwelliae)*

The biologist walked meandering transects throughout the survey area to ensure complete coverage of all suitable habitat for all target species.

A list of all plants observed within the Study Area was generated and is included in Appendix C. All species were identified to the lowest possible taxonomic level required to assess rarity. Plant species identification, nomenclature, and taxonomy followed the Jepson eFlora (Jepson eFlora 2024). Vegetation community classification was based on the classification systems presented in the MCV (CNPS 2024b).

None of the targeted species were observed in the BSA during the survey.

4.0 RESULTS

4.1 Site Characteristics and Land Use

The BSA is located on established wastewater treatment ponds. The BSA is situated at an elevational range of approximately 195 to 210 feet above mean sea level in the Sacramento Valley region of the California floristic province (Jepson eFlora 2024). The average winter low temperature is 36.9 degrees Fahrenheit and the average summer high temperature is 92.9˚F; the average annual precipitation is approximately 27.39 inches at the Chico University Farm station, which is approximately 7 miles south of the BSA (NOAA 2024a).

The BSA is currently occupied by wastewater evaporation ponds, levees, and open grasslands. Undeveloped portions of the BSA primarily include annual grasslands, ruderal, riparian and wetland habitats. Vegetation communities and plant species composition are described in further detail below.

Land uses surrounding the BSA include the Chico Regional Airport, commercial developments, and open space. Figure 2 provides an overview of the Project setting, including existing land uses within and adjacent to the BSA. Representative photographs of the BSA are provided in Appendix B.

4.2 Soils and Geology

ECORP staff obtained soil survey mapping for the BSA from the NRCS *Web Soil Survey* accessed on May 8, 2024 (Figure 3). Table 1 provides an overview of the soil series mapped within the BSA and key features of the soil series, such as hydric rating or presence of serpentine or gabbroic soil material.

Table 1. Soil Series Mapped in the BSA

Map unit symbol	Map unit name	Parent Material	Hydric Soil Rating
300	Redsluff gravely loam, 0 to 2 percent slopes	Fine-loamy alluvium derived from igneous, metamorphic and sedimentary rock over gravelly alluvium derive from volcanic rock	No
301	Wafap-Hamslough, 0 to 2 percent slopes	Wafap-Gravelly and clayey alluvium over cobbly channel alluvium over cemented cobbly and gravelly derived alluvium derived from volcanic rock Hamslough-Clayey alluvium over clayey and gravelly alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock	No/Yes
302	Redtough-redswale, 0 to 2 percent slopes	Redtough-Loamy alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock Redswale- cobbly and loamy alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock	No/No
991	Xerofluvents, 0 to 4 percent slopes frequently flooded	Stratified sandy and gravelly alluvium derived from igneous, metamorphic, and sedimentary rock	No

Map Date: 9/29/2025
Sources: Maxar, Esri World Imagery

Figure 2. Project Setting

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2024-138.02A Chico Airport Pond Sewer Repair Project

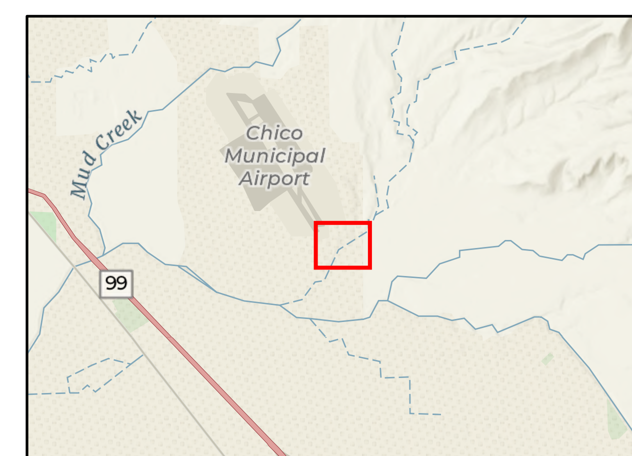
Map Contents

Study Area - 11.85 ac.

Series Number - Series Name

- 300 - Redsluff gravelly loam, 0 to 2 percent slopes
- 301 - Wafap-Hamslough , 0 to 2 percent slopes
- 302 - Redtough-Redswale , 0 to 2 percent slopes
- 991 - Xerofluvents and 0 to 4 percent slopes frequently flooded

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for BUTTE, CA



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Soils_and_Geology\CASRP Soils.aprx - CASRP Soils 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 3. Natural Resources Conservation Service Soil Types

2024-138.02A Chico Airport Pond Sewer Repair Project

4.3 Vegetation Communities and Land Cover Types

The following sections describe vegetation communities and land cover types within the Study Area as observed during the site reconnaissance. A full list of plants observed onsite can be found in Appendix C. The approximate extent of vegetation communities and land cover types are depicted in Figure 4.

4.3.1 Annual Grassland

The annual grassland community is found in the western and southeastern portions of the BSA. The annual grassland in the BSA is dominated by nonnative annual grasses including Italian ryegrass (*Festuca perennis*), foxtail barley *(Hordeum murinum),* wild oats *(Avena fatua),* and soft chess *(Bromus hordeaceus)*. Dominant forb is Italian thistle *(Carduus pycnocephalus)*.

The annual grasslands can be characterized as the Avena spp. - Bromus spp. Herbaceous Semi-Natural Alliance (CNPS 2024a). Semi-natural alliances are strongly dominated by nonnative plants that have become naturalized in the State, do not have state rarity rankings, and are not considered sensitive natural communities. The annual grasslands in this BSA near Sheep's Hallow exhibit riparian vegetation in the form of shrubs and medium sized oak trees.

4.3.2 Disturbed/Developed

The disturbed or developed land cover type is found circling the outer edge within the BSA and is composed of gravel roads and levees. These areas are either devoid of vegetation or dominated by nonnative ruderal herbaceous species, including soft chess, foxtail barley and wild oats.

4.4 Aquatic Resources

Review of the NWI showed four mapped aquatic features within the BSA (Figure 5). The NWI mapping indicates the presence of Freshwater Emergent Wetlands, Freshwater Ponds, and Riverine habitats within and adjacent to the BSA (USFWS May 8, 2024). Note that the NWI inventory mapping is a national dataset based on data prepared from the analysis of high-altitude imagery in conjunction with collateral data sources and field work. A margin of error is inherent in the use of imagery; thus, on-the-ground inspection of a particular study area is needed to confirm wetland boundaries and classifications.

A formal Aquatic Resources Delineation has been conducted. The aquatic features identified onsite include an intermittent drainage, an ephemeral drainage, and a pond (Figure 6). These features are further described in the following sections.

Map Contents

Study Area - 11.85 ac.

Vegetation Communities and Land Cover Types

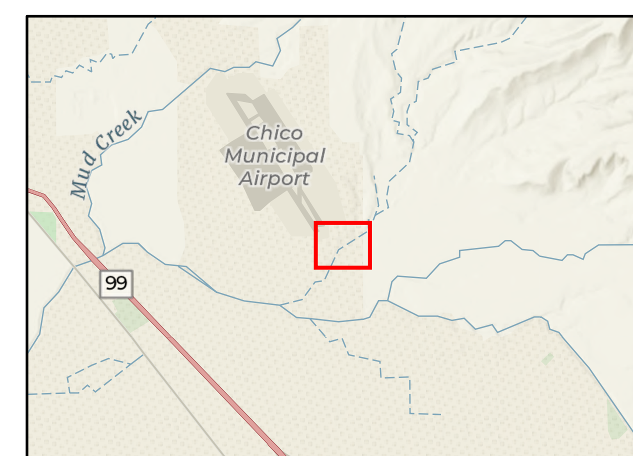
Vegetation Communities

Annual Grasslands

Land Cover Types

Disturbed/Developed

Sources: Maxar (2023), Esri World Imagery



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Map Date: 9/30/2025

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Scale in Feet
0 200

Figure 4. Vegetation Communities and Land Cover Types

2024-138 Chico Airport Sewer Repair Project

Map Contents

Study Area - 11.85 ac.

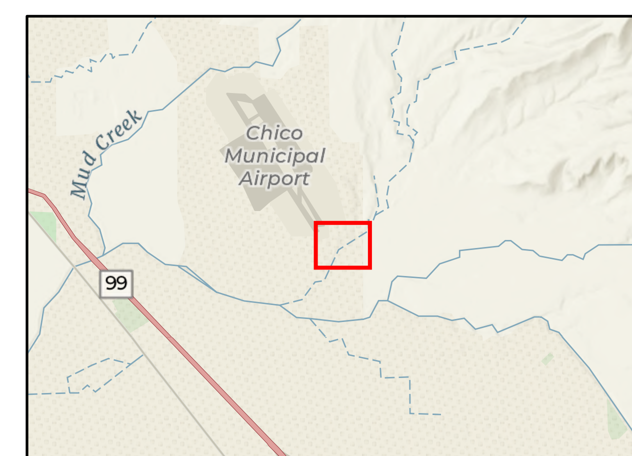
NWI Type

Freshwater Emergent Wetland

Freshwater Pond

Riverine

Sources: Maxar, Esri World Imagery, NWI 2024



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aquatic_Resources\CASRP Aquatic Resources.aprx - CASRP NWI 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 5. National Wetlands Inventory

2024-138.02A Chico Airport Pond Sewer Repair Project

Map Contents

Study Area - 11.85 ac.

Stormwater and Wastewater Detention Basin - 1.671 ac.

Reference Coordinates

Culvert

Sample Points

Upland Sample Point

Transect Point

Aquatic Resources (0.704 ac.)

Other Waters (0.704 ac.)

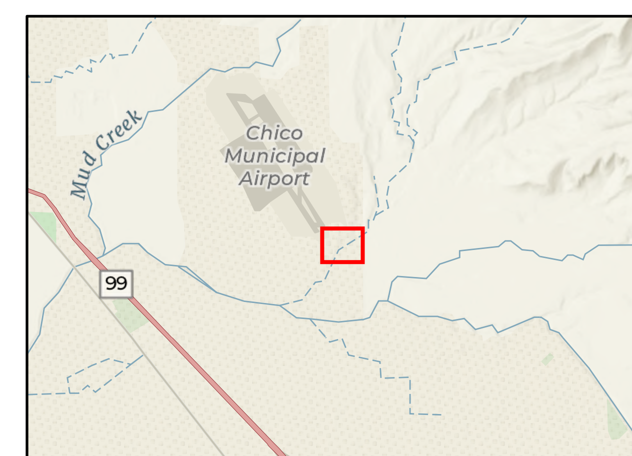
Ephemeral Drainage (0.486 ac.)

Intermittent Drainage (0.218 ac.)

Photo Source: Maxar (2024)
Boundary Source: Bennett Engineering Services
Delineator(s): Daniel Machek and Laurens Kuypers
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

* The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aquatic_Resources\CASRP Aquatic Resources.aprx - CASRP ARD 20250320 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 150

Figure 6. Aquatic Resources Delineation

2024-138.02A Chico Airport Pond Sewer Repair Project

4.4.1 Intermittent Drainage

Intermittent drainages are linear features that exhibit a bed and bank, an ordinary high-watermark (OHWM), and flow for weeks or months following significant precipitation events. Intermittent drainages differ from ephemeral drainages in that they flow for longer duration and are influenced by groundwater sources. This usually results in greater quantities and duration of flow relative to ephemeral drainages. The intermittent drainage called Sheep's Hollow flows east to west adjacent to and through the southern portion of the BSA. Dominant plant species observed below the OHWM within the BSA included Italian ryegrass, curly dock (*Rumex crispus),* and soft rush (*Bromus hordeaceus*). The intermittent drainage was moderately vegetated above the OHWM within the BSA. Plant species observed above the OHWM of the intermittent drainage included valley oak (*Quercus lobata*) saplings in the shrub/sapling stratum and Italian ryegrass (*Festuca perennis*).

4.4.2 Pond

Ponds are inland lacustrine aquatic resources that consist of depressions that have standing water. They are perennially or intermittently inundated during the growing season depending on the source of the water and permeability of the soil. Ponds are smaller than lakes and can be formed naturally or by excavation or embanking. Ponds exhibit an OHWM and may support hydrophytic vegetation and hydric soils. There is one pond within the BSA that is utilized for the City of Chico's wastewater system. The pond has had various modifications made in the past and currently has wastewater and stormwater comingling in the space prior to being sent into the City's sewer system.

4.5 Wildlife

The BSA provides habitat for a variety of wildlife species. Wildlife species observed onsite include Swainson's hawk *(Buteo swainsoni),* jack rabbit (*Lepus californicus*), killdeer (*Charadrius vociferus),* and alligator lizard *(Elgaria*). Other species typically associated with the habitat types found in the BSA include raptors and migratory birds.

4.6 Special-Status Species

Table 2 presents the full list of special-status plant and animal species identified through the literature review. For each species, the table provides the listing status, a brief description of habitat requirements and/or species ecology, a determination of the potential to occur within the BSA, and the rationale for that determination. The potential for each species to occur onsite was assessed using the following criteria:

- **Present** – Species was observed during the site visit or is known to occur within the BSA based on recent documented occurrences within the CNDDB or other literature.
- **Potential to Occur** – Suitable habitat (including soils and elevation requirements) occurs in the BSA and the species is known or expected to occur in the Project vicinity based on available data sources or professional knowledge/experience.

- **Low Potential to Occur** – Marginal or limited amounts of habitat occur or the species is not known to occur in the vicinity of the Project based on CNDDB records and other available information.
- **Absent** – No suitable habitat (including soils and elevation requirements) or the species is not known to occur within the vicinity of the Project based on CNDDB records and other documentation.

Following the table is a brief description and discussion of each special-status species that was determined to have potential to occur onsite.

Table 2. Special-Status Species Evaluation

Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential To Occur Onsite
	ESA	CESA/ NPPA	Other		
Plants					
Ferris' milk-vetch *(Astragalus tener* var. *ferrisiae)*	–	–	1B.1	Vernally mesic meadows and seeps and in sub–alkaline flats within valley and foothill grasslands. Elevation: 5'–245' Bloom Period: April–May	Absent. There is no alkaline habitat in the BSA.
Big-scale balsamroot *(Balsamorhiza macrolepis)*	–	–	1B.2	Chaparral, cismontane woodland, and valley and foothill grassland, sometimes on serpentine soils. Elevation: 150'–5,100' Bloom Period: March–June	Low potential to occur. The grassland within the BSA may provide marginally suitable habitat; however, this species was not observed during the 2024 plant surveys.
Callahan's mariposa-lily *(Calochortus syntrophus)*	–	–	1B.1	Cismontane woodland and vernally mesic valley and foothill grassland. Elevation: 1,725'–3,755' Bloom Period: May–June	Absent. The BSA is significantly outside of the known elevational range for this species.
Spicate calycadenia *(Calycadenia spicata)*	–	–	1B.3	Adobe, clay, disturbed areas, dry, gravelly, openings, roadsides, and rocky sites within cismontane woodland and valley and foothill grassland. Elevation: 130'–4,595' Bloom Period: May–September	Potential to occur. The grassland and disturbed areas in the BSA provide suitable habitat however, this species was not observed during the 2024 plant surveys..

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Dissected-leaved toothwort (*Cardamine pachystigma* var. *dissectifolia*)	–	–	1B.2	Rocky, usually serpentine soils of chaparral and lower montane coniferous forest. Elevation: 835'–6,890' Bloom Period: February– May	Absent. The BSA is significantly outside of the known elevational range for this species and does not include suitable habitat.
Pink creamsacs *(Castilleja rubicundula* var. *rubicundula)*	–	–	1B.2	Serpentine substrates in chaparral openings, cismontane woodland, meadows and seeps, and valley and foothill grassland. Elevation: 65'–2,985' Bloom Period: April–June	Absent. There is no serpentine habitat in the BSA.
White-stemmed clarkia (*Clarkia gracilis* ssp. *albicaulis*)	–	–	1B.2	Sometimes serpentine soils of chaparral and cismontane woodland. Elevation: 805'–3,560' Bloom Period: May–July	Absent. The BSA is significantly outside of the known elevational range for this species and does not include suitable habitat.
Mildred's clarkia (*Clarkia mildrediae* ssp. *mildrediae*)	–	–	1B.3	Sandy, usually granitic soils of cismontane woodland and lower montane coniferous forest. Elevation: 805'–5,610' Bloom Period: May–August	Absent. The BSA is significantly outside of the known elevational range for this species and does not include suitable habitat.
Silky cryptantha (*Cryptantha crinita*)	–	–	1B.2	Gravelly streambeds of cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, and valley and foothill grassland habitats. Elevation: 200'–3,985' Bloom Period: April–May	Absent. No suitable habitat within the BSA.
Dwarf downingia *(Downingia pusilla)*	–	–	2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species has also been found in disturbed areas such as tire ruts and scraped depressions (CDFW 2024b). Elevation: 5'–1,460' Bloom Period: March–May	Low potential to occur. The wastewater treatment ponds may provide marginally suitable habitat however, this species was not observed during the 2024 plant surveys.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Ahart's buckwheat (*Eriogonum umbellatum* var. *ahartii*)	–	–	1B.2	Serpentine soils, slopes, and openings of chaparral and cismontane woodland. Elevation: 1,310'–6,560' Bloom Period: June–September	Absent. The BSA is significantly outside of the known elevational range for this species and does not include suitable habitat.
Hoover's spurge (*Euphorbia hooveri*)	FT	–	1B.2	Vernal pools. Elevation: 80'–820' Bloom Period: July–September	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.
Adobe lily *(Fritillaria pluriflora)*	–	–	1B.2	Adobe soils in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 195'–2,315' Bloom Period: February–April	Low potential to occur. The grassland within the BSA may provide marginally suitable habitat, however, this species was not observed during the 2024 plant surveys.
Boggs Lake hedge-hyssop *(Gratiola heterosepala)*	–	CE	1B.2	Clay substrates of marshes and swamps (lake margins) and vernal pools. Elevation: 35'–7,790' Bloom Period: April–August	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*	–	–	1B.2	Marshes and freshwater swamps. Often in riprap on sides of levees. Elevation: 0'–395' Bloom Period: June–September	Absent. There is no marsh habitat in the BSA.
California satintail *(Imperata brevifolia)*	–	–	2B.1	Mesic areas in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali) and riparian scrub. Elevation: 0'–3,985' Bloom Period: September–May	Absent. There is no suitable habitat in the BSA.
Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus)*	–	–	1B.1	Vernally mesic areas in chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation: 115'–4,100' Bloom Period: March–June	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Coulter's goldfields *(Lasthenia glabrata* ssp. *coulteri*)	–	–	1B.1	Coastal marshes and swamps, playas, and vernal pools. Elevation: 5'–4,005' Bloom Period: February–June	Absent. There is no suitable aquatic habitat within the BSA.
Legenere *(Legenere limosa)*	–	–	1B.1	Various seasonally inundated areas including wetlands, wetland swales, marshes, vernal pools, artificial ponds, and floodplains of intermittent drainages (USFWS 2006). Elevation: 5'–2,885' Bloom Period: April–June	Absent. There is no suitable aquatic habitat within the BSA.
Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*)	FE	CE	1B.1	Mesic valley and foothill grassland and vernal pools. Elevation: 150'–3,050' Bloom Period: March–May	Low potential to occur. The wastewater treatment ponds within the BSA may provide very marginal habitat however, this species was not observed during the 2024 plant surveys.
Veiny monardella *(Monardella venosa)*	–	–	1B.1	Heavy clay soils in cismontane woodland and valley and foothill grasslands. Elevation: 195'–1,345' Bloom Period: May–July	Low potential to occur. The grassland within the BSA may provide marginally suitable habitat however, this species was not observed during the 2024 plant surveys.
California Orcutt grass (*Orcuttia californica*)	FE	CE	1B.1	Vernal pools Elevation: 50'–2,165' Bloom Period: April–August	Absent. The BSA is outside of the known geographical range for this species and does not include suitable habitat.
Hairy Orcutt grass *(Orcuttia pilosa)*	FE	CE	1B.1	Vernal pools. Elevation: 150'–655' Bloom Period: May–September	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.
Slender Orcutt grass *(Orcuttia tenuis)*	FT	CE	1B.1	Vernal pools, often gravelly. Elevation: 115'–5,775' Bloom Period: May–September	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Ahart's paronychia (*Paronychia ahartii*)	–	–	1B.1	Well–drained rocky outcrops, often vernal pool edges, and volcanic upland (Hartman and Rabeler 2012) of cismontane woodland, valley and foothill grassland, and vernal pools. Elevation: 100'–1,675' Bloom Period: February–June	Low potential to occur. The grassland within the BSA may provide marginally suitable habitat however, this species was not observed during the 2024 plant surveys.
California beaked-rush *(Rhynchospora californica)*	–	–	1B.1	Bogs and fens, lower montane coniferous forest, seeps in meadows, and freshwater marshes and swamps. Elevation: 150'–3,315' Bloom Period: May–July	Absent. There is no marsh habitat in the BSA.
Brownish beaked-rush *(Rhynchospora capitellata)*	–	–	2B.2	Mesic areas in lower montane coniferous forest, upper montane coniferous forests, meadows and seeps, marshes and swamps. Elevation: 150'–6,560' Bloom Period: July–August	Absent. There is no suitable aquatic habitat within the BSA.
Hall's rupertia (*Rupertia hallii*)	–	–	1B.2	Sometimes roadsides and often openings in cismontane woodland and lower montane coniferous forest. Elevation: 1,790'–7,380' Bloom Period: June–August	Absent. The BSA is significantly outside of the known elevational range for this species and does not include suitable habitat.
Sanford's arrowhead *(Sagittaria sanfordii)*	–	–	1B.2	Shallow marshes and freshwater swamps. Elevation: 0'–2,135' Bloom Period: May–October	Absent. There is no marsh habitat in the BSA.
Siskiyou jellyskin lichen (*Scytinium siskiyouense*)	–	–	1B.1	Epiphytic, usually on the bark of plants in the Fagaceae family, such as *Quercus* or *Chrysolepis,* in lower montane coniferous forest and North Coast coniferous forest. Elevation: 2,085'–4,790' Bloom Period: N/A	Absent. The BSA is significantly outside of the known elevational range for this species and does not include coniferous forest.
Butte County checkerbloom (*Sidalcea robusta*)	–	–	1B.2	Chaparral and cismontane woodland. Elevation: 295'–5,250' Bloom Period: April–June	Absent. There is no suitable habitat in the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Northern slender pondweed (*Stuckenia filiformis* ssp. *alpina*)	–	–	2B.2	Assorted shallow freshwater marshes and swamps. Elevation: 985'–7,055' Bloom Period: May–July	Absent. The BSA is significantly outside of the known elevational range for this species and does not include marsh habitat.
Greene's tuctoria *(Tuctoria greenei)*	FE	CR	1B.1	Vernal pools. Elevation: 100'–3,510' Bloom Period: May–July	Absent. The wastewater treatment ponds do not provide suitable habitat for vernal pool species.
Invertebrates					
Conservancy fairy shrimp (*Branchinecta conservatio)*	FE	–	–	Vernal pools/wetlands. Survey Period: November-April when surface water is present.	Absent. There is no suitable habitat within the BSA
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	–	–	Vernal pools/wetlands. Survey Period: November–April when surface water is present.	Absent. There is no suitable habitat within the BSA.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	–	–	Vernal pools/wetlands. Survey Period: November-April when surface water is present.	Absent. There is no suitable habitat within the BSA.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	–	–	Found exclusively on its host plant, the elderberry shrub, in riparian and oak woodland/ oak savannah habitats of California's Central Valley from Shasta to Madera counties.	Absent. There is no suitable habitat within the BSA.
Monarch butterfly (*Danaus plexippus*)	FC	–	–	Overwinters along coastal California in wind-protected groves of eucalyptus, Monterey pine and cypress with nearby nectar and water sources; disperses in spring throughout California. Adults breed and lay eggs during the spring and summer, feeding on a variety of nectar sources; eggs are laid exclusively on milkweed plants.	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential To Occur Onsite
	ESA	CESA/ NPPA	Other		
Crotch bumble bee *(Bombus crotchii)*	–	CC	–	Primarily nests underground in open grassland and scrub habitats from the California coast east to the Sierra Cascade and south to Mexico. Survey Period: March-September	Potential to Occur. The open grass lands provide suitable habitat in the BSA.
Fish					
Green sturgeon (*Acipenser medirostris*)	FT	–	CDFW: SSC	Anadromous; undammed cold-water perennial rivers having relatively deep pools with large substrates. Survey Period: N/A	Absent. The BSA is outside the range of the species.
Chinook salmon (Central Valley spring-run ESU) (*Oncorhynchus tshawytscha*)	FT	CT	–	Undammed perennial rivers, streams, creeks in the Sacramento and San Joaquin River systems. Survey Period: N/A	Absent. The BSA does not provide suitable habitat for the species.
Steelhead (CA Central Valley DPS) (*Oncorhynchus mykiss irideus*)	FT	–	–	Fast-flowing, well-oxygenated perennial rivers and streams below dams in the Sacramento and San Joaquin River systems. Survey Period: N/A	Absent. The BSA does not provide suitable habitat for the species.
Amphibians					
Western spadefoot Northern DPS (*Spea hammondii*)	FPT	–	SSC	California endemic species of vernal pools, swales, and seasonal wetlands in grassland, scrub and woodland habitats throughout the Central Valley and South Coast Ranges. Prefers open areas with sandy or gravelly soils. Survey Period: Winter-Spring.	Potential to Occur. The intermittent drainage within the BSA provides suitable habitat.
Foothill yellow-legged frog North Feather River/Upper Feather River Watershed Clade (*Rana boylii*)	FT	CT	SSC	Partly shaded shallow streams and riffles in variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of permanent water to attain metamorphosis. Can be active	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential To Occur Onsite
	ESA	CESA/ NPPA	Other		
				all year in warmer locations; become inactive or hibernate in colder climates. Feather River watershed above Oroville. Survey Period: May–October.	
Foothill yellow-legged frog Northwest/North Coast Clade (*Rana boylii*)	–	–	SSC	Partly shaded shallow streams and riffles in variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of permanent water to attain metamorphosis. Can be active all year in warmer locations; become inactive or hibernate in colder climates. Northern Coast Ranges, Klamath Mountains and Cascade Range. Survey Period: May–October.	Absent. BSA is outside of clade boundary and no suitable habitat is present within the BSA.
Reptiles					
Northwestern pond turtle (*Actinemys marmorata*)	FPT	–	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches. Survey Period: April-September	Absent. There is no suitable habitat within the BSA.
Blainville's ("Coast") horned lizard (*Phrynosoma blainvillii*)	–	–	SSC	Formerly a wide-spread horned lizard found in a wide variety of habitats, often in lower elevation areas with sandy washes and scattered low bushes. Also occurs in Sierra Nevada foothills. Requires open areas for basking, but with bushes or grass clumps for cover, patches of loamy soil or sand for burrowing and an abundance of ants (Stebbins and McGinnis 2012). In the northern Sacramento area, this	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential To Occur Onsite
	ESA	CESA/ NPPA	Other		
				species appears restricted to the foothills between 1000 to 3000 feet from Cameron Park (El Dorado County) north and west to Grass Valley and Nevada City. Survey Period: April-October	
Giant garter snake (*Thamnophis gigas*)	FT	CT	–	Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range. Survey Period: April-October	Absent. There is no suitable habitat within the BSA.
Birds					
Bald eagle (*Haliaeetus leucocephalus*)	De-listed	CE	CFP	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g., rivers, lakes), wetlands, flooded agricultural fields, open grasslands. Nesting: February-September Wintering: October-March	Absent. There is no suitable nesting or foraging habitat onsite.
Swainson's hawk (*Buteo swainsoni*)	–	CT	–	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures. Nesting: March-August	Potential to Occur. There is potentially suitable nesting and foraging habitat onsite.
California black rail (*Laterallus jamaicensis coturniculus*)	–	CT	CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer, El Dorado	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
				counties). Nesting: March-September	
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	CE	–	Breeding habitat is generally open woodland with clearings and low, dense, scrubby vegetation associated with watercourses, and includes desert riparian woodlands with willow, Fremont's cottonwood, alder, walnut, box-elder, and dense mesquite. Nests are generally found in deciduous hardwoods with thick bushes, vines, or hedgerows providing dense foliage within 10 meters (33 feet) of ground; prefer riparian patches of at least 81 hectares (200 acres) (Hughes 2020). Winters in South America. Nesting: June 15-August 15	Absent. There is no suitable habitat within the BSA.
Burrowing owl (*Athene cunicularia*)	CC	--	BCC, SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g., prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds. Nesting: February-August	Potential to Occur. There are several potential burrows with signs of presence within the BSA.
Bank swallow (*Riparia riparia*)	–	CT	–	Nests colonially along coasts, rivers, streams, lakes, reservoirs, and wetlands in vertical banks, cliffs, and bluffs in alluvial, friable soils. May also nest in sand, gravel quarries and road cuts. In California, breeding range includes northern and central	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
	Status				
Common Name (Scientific Name)	ESA	CESA/ NPPA	Other	Habitat Description/ Species Ecology	Potential To Occur Onsite
				California. Nesting: May-July	
Least Bell's vireo (*Vireo bellii pusillus*)	FE	CE	–	In California, breeding range includes Ventura, Los Angeles, Riverside, Orange, San Diego, and San Bernardino counties, and rarely Stanislaus and Santa Clara counties. Nesting habitat includes dense, low shrubby vegetation in riparian areas, brushy fields, young second-growth woodland, scrub oak, coastal chaparral and mesquite brushland. Winters in southern Baja California Sur. Nesting: April 1-July 31	Absent. There is no suitable habitat within the BSA.
Tricolored blackbird (*Agelaius tricolor*)	–	CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta counties south to San Bernardino, Riverside and San Diego counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields. Nesting: March-August	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	–	CE	BCC	Resident coastally from Point Conception south into Baja California; coastal salt marsh. Year-round resident; nests March-August	Absent. The BSA is outside the range of this species and there is no suitable nesting habitat onsite.
Bullock's oriole (*Icterus bullockii*)	–	–	BCC	Breeding habitat includes riparian and oak woodlands. Nesting: March-July	Absent. There is no suitable nesting habitat within the BSA.
California gull (nesting colony) *(Larus californicus)*	–	–	BCC, CDFW WL	Nesting occurs in the Great Basin, Great Plains, Mono Lake, and south San Francisco Bay. Breeding colonies located on islands on natural lakes, rivers, or reservoirs. Winters along Pacific Coast from southern British Columbia south to Baja California and Mexico. In California, winters along coast and inland (Central Valley, Salton Sea). Nesting: April-August	Absent. There is no suitable nesting habitat within the BSA.t
Cassin's finch (*Haemorhous cassinii*)	–	–	BCC	Breeds throughout the conifer belts of North America's western interior mountains, from central British Columbia to northern New Mexico and Arizona; mostly between 3,000'-10,000' elevation. Often in mature forests of pine, spruce and aspen; especially open, dry pine forests. Some will breed in open sagebrush shrubland with scattered western junipers. Nesting: May-July	Absent. There is no suitable habitat within the BSA.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	–	–	BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego County. Nesting: March-July	Absent. There is no suitable habitat within the BSA..
Golden eagle (*Aquila chrysaetos*)	–	–	CFP, CDFW WL	Nesting habitat includes mountainous canyon land, rimrock terrain of open desert and grasslands, riparian, oak	Absent. There is no suitable habitat within the BSA.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
				woodland/ savannah, and chaparral. Nesting occurs on cliff ledges, river banks, trees, and human-made structures (e.g., windmills, platforms, and transmission towers). Breeding occurs throughout California, except the immediate coast, Central Valley floor, Salton Sea region, and the Colorado River region, where they can be found during Winter. Nesting: February-August Wintering in Central Valley: October-February	
Lawrence's goldfinch (*Spinus lawrencei*)	–	–	BCC	Breeds in Sierra Nevada and inner Coast Range foothills surrounding the Central Valley and the southern Coast Range to Santa Barbara County east through southern California to the Mojave Desert and Colorado Desert into the Peninsular Range. Nests in arid and open woodlands with chaparral or other brushy areas, tall annual weed fields, and a water source (e.g., small stream, pond, lake), and to a lesser extent riparian woodland, coastal scrub, evergreen forests, pinyon-juniper woodland, planted conifers, and ranches or rural residences near weedy fields and water. Nesting: March-September	Absent. There is no suitable habitat within the BSA.
Long-eared owl *(Asio otus)*	–	–	BCC, SSC	Nests in open forests, riparian woodland, conifer forests, dense vegetation adjacent to grasslands, shrublands or other open communities. Nesting: March-August Wintering in Central Valley: November-March	Absent. There is no suitable habitat within the BSA..

Table 2. Special-Status Species Evaluation					
	Status				
Common Name (Scientific Name)	ESA	CESA/ NPPA	Other	Habitat Description/ Species Ecology	Potential To Occur Onsite
Northern harrier (*Circus hudsonius*)	–	–	BCC, SSC	Nests on the ground in open wetlands, marshy meadows, wet/lightly grazed pastures, (rarely) freshwater/brackish marshes, tundra, grasslands, prairies, croplands, desert, shrub-steppe, and (rarely) riparian woodland communities. Nesting: April-September	Absent. There is no suitable habitat within the BSA.
Nuttall's woodpecker *(Dryobates nuttallii)*	–	–	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands. Nesting: April-July	Absent. There is no suitable habitat within the BSA.
Oak titmouse (*Baeolophus inornatus*)	–	–	BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree). Nesting: March-July	Absent. There is no suitable habitat within the BSA.
Olive-sided flycatcher *(Contopus cooperi)*	–	–	SSC, BCC	Nests in montane and northern coniferous forests, in forest openings, forest edges, semiopen forest stands. In California, nests in coastal forests, Cascade and Sierra Nevada region. Winters in Central to South America. Nesting: May-August	Absent. There is no suitable habitat within the BSA.
Santa Barbara song sparrow *(Melospiza melodia graminea)*	–	–	BCC	Breeding habitat includes dense shrubs and thickets of giant coreopsis (*Coreopsis gigantea*), grasslands with scattered shrubs, *Artemisia-Opuntia* grass associations, and dense grasslands. Resident on California Channel Islands (San Clemente, San Miguel, Santa Cruz, Santa	Absent. The BSA is outside the species known range and there is no suitable nesting habitat onsite.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	**Status**			**Habitat Description/ Species Ecology**	**Potential To Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
				Rosa, Anacapa) and Isla Los Coronados, Baja California.	
Western screech-owl (*Megascops kennicottii*)	–	–	BCC	Breeding habitat includes vegetation communities with deciduous trees, such as riparian, desert, and oak and pine-oak woodlands. Nesting: March-July	Absent. There is no suitable habitat within the BSA.
Wrentit (*Chamaea fasciata*)	–	–	BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens. Nesting: March-August	Absent. There is no suitable habitat within the BSA.
Mammals					
Western red bat (*Lasiurus frantzii*)	–	–	SSC	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2024). Survey Period: April-September	Low Potential to Occur. No intact riparian woodlands; however, mature cottonwood and oak trees within the BSA provide marginally suitable habitat.
Pallid bat (*Antrozous pallidus*)	–	–	SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human occupied as well as vacant buildings (WBWG 2024).	Low Potential to Occur. The mature trees within the BSA may provide suitable day roosting habitat.

Table 2. Special-Status Species Evaluation					
Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential To Occur Onsite
	ESA	CESA/ NPPA	Other		
				Survey Period: April-September	
Western mastiff bat (*Eumops perotis californicus*)	–	–	SSC	Primarily a cliff-dwelling species, found in similar crevices in large boulders and buildings (WBWG 2024). Survey Period: April-September	Absent. There is no suitable habitat within the BSA.

Status Codes

ESA	Federal Endangered Species Act
CESA	California Endangered Species Act
FE	ESA listed, Endangered
FT	ESA listed, Threatened
FPE	Formally Proposed for ESA listing as Endangered
FPT	Formally Proposed for ESA listing as Threatened
FC	Candidate for ESA listing as Threatened or Endangered
BCC	USFWS Bird of Conservation Concern (USFWS 2021)
CE	CESA- or NPPA listed, Endangered
CT	CESA- or NPPA-listed, Threatened
CR	CESA- or NPPA-listed, Rare
CC	Candidate for CESA listing as Endangered or Threatened
CFP	California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, §5050-reptiles/amphibians)
SSC	CDFW Species of Special Concern
CDFW WL	CDFW Watch List
1B	CRPR/Rare or Endangered in California and elsewhere
2B	CRPR/Plants rare, threatened, or endangered in California but more common elsewhere
0.1	Threat Rank/Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
0.2	Threat Rank/Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
0.3	Threat Rank/Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
NPPA	California Native Plant Protection Act
DPS	Distinct Population Segment
ESU	Evolutionarily Significant Unit
WBWG	Western Bat Working Group

4.6.1 Plants

A total of 33 special-status plant species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, 26 plant species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment. A brief description of the remaining seven plants with potential to occur onsite is provided below.

4.6.1.1 Adobe-Lily

Adobe-lily (*Fritillaria pluriflora*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial bulbiferous herb that often occurs on adobe soils in chaparral, cismontane woodland, and valley and foothill grassland. Adobe-lily blooms from February through April and is known to occur from 195 to 2,315 feet above mean sea level (MSL). Adobe-lily is endemic to California; the current range of this species includes Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo counties (CNPS 2024a).

There are 11 CNDDB occurrences of adobe lily within 5 miles of the BSA (CDFW 2024b). The grassland within the BSA may provide marginally suitable habitat. Adobe lily has low potential to occur within the BSA.

4.6.1.2 Ahart's Paronychia

Ahart's paronychia (*Paronychia ahartii*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. Ahart's paronychia is an annual herb that occurs in cismontane woodland, valley foothill and grassland and vernal pools. Ahart's paronychia blooms from February through June and is known to occur at elevations ranging from 100 to 1,675 feet above MSL. Ahart's paronychia is endemic to California; the current range of this species includes Butte, Shasta, and Tehama counties (CNPS 2024a).

There are three CNDDB occurrences of Ahart's paronychia within 5 miles of the BSA (CDFW 2024b). The grassland within the BSA may provide marginally suitable habitat. Ahart's paronychia has low potential to occur within the BSA.

4.6.1.3 Big-Scale Balsamroot

Big-scale balsamroot (*Balsamorhiza macrolepis*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous perennial that occurs in chaparral, cismontane woodlands, valley and foothill grassland, and sometimes on serpentinite soils. Big-scale balsamroot blooms from March through June and is known to occur at elevations ranging from 150 to 5,100 feet above MSL. Big-scale balsamroot is endemic to California; the current range of this species includes Alameda, Amador, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Shasta, Solano, Sonoma, Tehama, and Tuolumne counties (CNPS 2024a).

There are no CNDDB occurrences of big-scale balsamroot within 5 miles of the BSA (CDFW 2024b). The grassland within the BSA may provide marginally suitable habitat within the BSA. Big-scale balsamroot has low potential to occur within the BSA.

4.6.1.4 Butte County Meadowfoam

Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) is listed as endangered pursuant to both the federal and California ESAs, and is designated as a CRPR 1B.1 species. Butte County meadowfoam is an herbaceous annual that occurs in vernal pools and mesic areas of valley and foothill grasslands. Butte

County meadowfoam blooms from March through May and is known to occur at elevations between 150 to 3,050 feet above MSL. Butte County meadowfoam is endemic to California; the current known range for this species is Butte County (CNPS 2024a).

There are twelve CNDDB occurrences of Butte County meadowfoam within 5 miles of the BSA (CDFW 2024b). The wastewater treatment ponds within the BSA may provide very marginal habitat. Butte County meadowfoam has low potential to occur within the BSA; however, this species was not observed during the 2024 plant surveys.

4.6.1.5 Spicate calycadenia

Spicate calycadenia (*Calycadenia spicata*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.3 species. This species is an herbaceous annual that occurs on adobe, clay, disturbed, dry, gravelly, roadsides, opening, and rocky areas of cismontane woodland and valley and foothill grasslands. Spicate calycadenia blooms from March through September and known to occur at elevations ranging from 130 to 4,595 feet above MSL. This species is endemic to California; the current range includes Amador, Butte, Calaveras, El Dorado, Fresno, Kern, Nevada, Placer. Sacramento, San Joaquin, Stanislaus, Tulare, Tuolumne, and Yuba Counties (CNPS 2024a).

There are no CNDDB occurrences of spicate calycadenia within 5 miles of the BSA (CDFW 2024b). The grassland and disturbed areas in the BSA provide suitable habitat. Spicate calycadenia has potential to occur within the BSA; however, this species was not observed during the 2024 plant surveys.

4.6.1.6 Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas of valley and foothill grasslands. Dwarf downingia has also been found in manmade features such as tire ruts, scraped depressions, stock ponds, and roadside ditches. This species blooms from March through May and is known to occur at elevations ranging from 5 to 1,460 feet above MSL. The current range of this species in California includes Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2024a).

There are no CNDDB occurrences of dwarf downingia within 5 miles of the BSA (CDFW 2024b). The wastewater treatment ponds may provide marginally suitable habitat. Dwarf downingia has low potential to occur within the BSA; however, this species was not observed during the 2024 plant surveys.

4.6.1.7 Veiny Monardella

Veiny monardella (*Monardella venosa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on heavy clay soils in cismontane woodland and valley and foothill grasslands. Veiny monardella blooms from May through July and is known to occur at elevations ranging from 195 to 1,345 feet above MSL. Veiny monardella is endemic to California; the current range of this species includes Butte, Sutter, Tuolumne, and Yuba counties (CNPS 2024a).

There are no CNDDB occurrences of veiny monardella within 5 miles of the BSA (CDFW 2024b). The grassland within the BSA may provide marginally suitable habitat. Veiny monardella has low potential to occur within the BSA; however, this species was not observed during the 2024 plant surveys.

4.6.2 Invertebrates

A total of 6 special-status invertebrate species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, 5 invertebrate species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment.

4.6.3 Crotch Bumble Bee

The Crotch bumble bee (*Bombus crotchii*) is a candidate for listing as endangered under the California ESA. The historic range of the Crotch bumble bee extends from coastal areas east to the edges of the desert in central California south to Baja California del Norte, Mexico, excluding mountainous areas (Thorpe et al. 1983, Williams et al. 2014). The species was historically common throughout the southern two-thirds of its range but is now largely absent from much of that area and is nearly extirpated from the center of its historic range, the Central Valley (Hatfield et al. 2014).

The Crotch bumble bee inhabits open grassland and scrub habitats (Williams et al. 2014). The species visits a wide variety of flowering plants, although its very short tongue makes it best suited to forage at open flowers with short corollas (Xerxes Society 2018). Plant families most commonly associated with Crotch bumble bee include Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae (Xerxes Society 2018). The species primarily nests underground (Williams et al. 2014). Little is known about overwintering sites for the species, but bumble bees generally overwinter in soft, disturbed soils or under leaf litter or other debris (Goulson 2010, Williams et al. 2014). The flight period for Crotch bumble bee queens in California is from late February to late October, peaking in early April with a second pulse in July (Thorp et al. 1983). The flight period for workers and males is California is from late March through September with peak abundance in early July (Thorp et al. 1983).

There is one CNDDB occurrence of Crotch bumble bee within 5 miles of the BSA (CDFW 2024b). The open grass lands provide suitable habitat in the BSA. Crotch bumble bee has potential to occur within the BSA.

4.6.4 Fish

A total of 3 special-status fish species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, all fish species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment.

4.6.5 Amphibians

A total of 3 special-status amphibian species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, two amphibian species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment. A brief description of the remaining species is provided below.

4.6.5.1 Western Spadefoot

The northern Distinct Population Segment (DPS) of western spadefoot (*Spea hammondii*) is proposed to be listed as threatened pursuant to the federal ESA, is not listed pursuant to the California ESA; however, it is designated as a CDFW SSC. Necessary habitat components of the western spadefoot include loose friable soils in which to burrow in upland habitats and breeding ponds. Breeding sites include temporary rain pools, such as vernal pools and seasonal wetlands, or pools within portions of intermittent drainages (Jennings and Hayes 1994). Spadefoots spend most of their adult life within underground burrows or other suitable refugia, such as rodent burrows. In California, western spadefoot toads are known to occur from the Redding area, Shasta County southward to northwestern Baja California, at elevations below 4,475 feet (Jennings and Hayes 1994).

There are eight CNDDB occurrences of western spadefoot within 5 miles of the BSA (CDFW 2024b). The intermittent drainage within the BSA provides suitable habitat. Western spadefoot has potential to occur within the BSA.

4.6.6 Reptiles

A total of 3 special-status reptile species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, all reptile species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment.

4.6.7 Birds

A total of 23 special-status bird species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, 21 bird species are presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of those species is provided in this assessment. A brief description of the remaining species is provided below.

4.6.7.1 Burrowing Owl

The burrowing owl (*Athene cunicularia*) is not listed pursuant to either the California or federal ESAs; however, it is designated as a BCC by the USFWS and a Candidate to be listed as threatened pursuant to CESA, and an SSC by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Poulin et al. 2020). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel (*Otospermophilus beecheyi*) but may also use manmade structures such as concrete culverts or pipes; concrete, asphalt, or wood debris piles; or openings beneath concrete or asphalt pavement (California Department of Fish and Game [CDFG] 2012). The breeding season typically occurs between February 1 and August 31 (CDFG 2012).

There are five CNDDB occurrences of burrowing owl within 5 miles of the BSA (CDFW 2024b). There are several potential burrows with signs of presence within the BSA. Burrowing owl has potential to occur within the BSA.

4.6.7.2 Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and are protected pursuant to the California Endangered Species Act. This species nests in North America (Canada, western U.S., and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2020). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest in tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel (*Otospermophilus beecheyi*), ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanoplus* species). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, discing, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There are no CNDDB occurrences of Swainson's hawk within 5 miles of the BSA (CDFW 2024b). There is suitable nesting and foraging habitat onsite. Swainson's hawk has potential to occur within the BSA.

4.6.8 Mammals

A total of three special-status mammal species were identified as having the potential to occur in the vicinity of the Study Area based on the literature review (Appendix A). However, upon further analysis following the site visit, one mammal species is presumed to be absent from the Study Area due to the lack of suitable habitat. No further discussion of this species is provided in this assessment. A brief description of the remaining two species is provided below.

4.6.8.1 Pallid Bat

The pallid bat (*Antrozous pallidus*) is not listed pursuant to either the federal or California ESAs; however, this species is considered an SSC by CDFW. The pallid bat is a large, light-colored bat with long, prominent ears and pink, brown, or grey wing and tail membranes. This species ranges throughout North America from the interior of British Columbia south to Mexico, and east to Texas. The pallid bat inhabits low elevation (below 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forest (Philpott 1996, WBWG 2024). This species roosts alone or in groups in the crevices of rocky outcrops and cliffs, caves, mines, trees, and in various human structures such as bridges, and barns. Pallid bats are feeding generalists that glean a variety of arthropod prey from surfaces as well as capturing insects on the wing. Foraging occurs over grasslands, oak savannahs, ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards.

Although this species utilizes echolocation to locate prey, they often use only passive acoustic cues. This species is not thought to migrate long distances between summer and winter sites (WBWG 2024).

There is one CNDDB occurrences of Pallid bat within 5 miles of the BSA (CDFW 2024b). The mature trees within the BSA may provide suitable day roosting habitat. Pallid bat has low potential to occur within the BSA.

4.6.8.2 Western Red Bat

The western red bat (*Lasiurus frantzii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered an SSC by CDFW. The western red bat is easily distinguished from other western bat species by its distinctive red coloration. This species is broadly distributed, its range extending from southern British Columbia in Canada through Argentina and Chile in South America, and including much of the western United States. This solitary species day roosts primarily in the foliage of trees or shrubs in edge habitats bordering streams or open fields, in orchards, and occasionally urban areas. They may be associated with intact riparian habitat, especially with willows, cottonwoods, and sycamores. This species may occasionally utilize caves for roosting as well. They feed on a variety of insects, and generally begin to forage 1 to 2 hours after sunset. This species is considered highly migratory, however the timing of migration and the summer ranges of males and females may be different. Winter behavior of this species is poorly understood (WBWG 2024).

There are two CNDDB occurrences of western red bat within 5 miles of the BSA (CDFW 2024b). Mature cottonwood and oak trees within the BSA provide marginally suitable habitat. Western red bat has low potential to occur within the BSA.

4.7 Critical Habitat or Essential Fish Habitat

There is no designated critical habitat mapped within the Study Area (NOAA 2024b).

Based on the literature review, anadromous fish critical habitat for Central Valley steelhead and Chinook salmon and Essential Fish Habitat for chinook salmon may be present in the “Richardson Springs, California” 7.5-minute quadrangle (NOAA 2024c). Big Chico Creek is located to the west and is outside the BSA.

4.8 Wildlife Movement Corridors and Nursery Sites

Sheep’s Hollow and adjacent upland areas within the BSA have the potential to serve as a wildlife movement corridor for aquatic and terrestrial wildlife species. CDFW’s CA Essential Habitat Connectivity mapping tool suggests that the BSA falls within the Natural Landscape Blocks mapping unit (CDFW 2024a).

5.0 RECOMMENDATIONS

This section summarizes recommended measures to avoid, minimize, or compensate for potential impacts to biological resources from the proposed Project.

5.1 General Recommendations

The following general measures are recommended to avoid impacts to biological resources:

- The Project impact limits shall be clearly demarcated prior to construction and all workers shall be made aware of the impact limits and avoided areas. If orange construction fencing is to be used, it shall be placed such that there is a one-foot gap between the ground and the bottom of the fencing to prevent snakes and other ground-dwelling animals from being caught in the fencing. No work shall occur outside of the Project impact limits. All vehicles and equipment shall be restricted to the Project impact limits and/or existing designated access roads and staging areas..
- Erosion control measures shall be placed between avoided aquatic resources and the outer edge of the impact limits prior to commencement of construction activities and shall be maintained until construction is completed and soils have been stabilized. Plastic monofilament netting or similar material shall not be used for erosion control, because smaller wildlife may become entangled or trapped in it. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers or tackified hydroseeding compounds.
- Any fueling in the Study Area shall use appropriate secondary containment techniques to prevent spills and shall occur at least 150 feet from potential aquatic resources.

5.2 Special-Status Species

Recommendations to minimize impacts to special status species or habitats are summarized below by species or taxonomic group.

5.2.1 Plants

There is potential for seven special-status plants to occur within the Study Area. Implementation of general recommendations BIO1 through BIO3, and the following specific measures are expected to avoid and/or minimize potential adverse effects on special-status plants:

- Perform floristic plant surveys according to USFWS, CDFW, and CNPS protocols prior to construction. Surveys shall be conducted by a qualified biologist and timed according to the appropriate phenological stage for identifying target species. Known reference populations shall be visited and/or local herbaria records shall be reviewed, if available, prior to surveys to confirm the phenological stage of the target species. If no special-status plants are found within the Project site, no further measures pertaining to special-status plants are necessary.

- If special-status plants are identified within 25 feet of the Project impact area, implement the following measures:
  - If avoidance of special-status plants is feasible, establish and clearly demarcate avoidance zones for special-status plant occurrences prior to construction and designate them as environmentally sensitive areas. Avoidance zones shall include the extent of the special-status plants plus a 25-foot buffer, unless otherwise determined by a qualified biologist, and shall be maintained until the completion of construction. A qualified biologist or biological monitor shall be present if work must occur within the avoidance buffer to ensure special-status plants are not impacted by the work.
  - If avoidance of special-status plants is not feasible, mitigation for significant impacts to special-status plants may be required. Mitigation measures shall be developed in consultation with CDFW. Mitigation measures may include restoration or permanent preservation of onsite or offsite habitat for special-status plants, and/or translocation of plants or seeds from impacted areas to unaffected habitats, and/or the purchase of compensatory mitigation credits.

5.2.2 Special-Status Wildlife Species

The following recommended measures are provided as the mechanism for potentially avoiding, minimizing, and mitigating proposed Project impacts to special-status wildlife species.

5.2.3 Crotch's Bumble Bee

Crotch's bumble bee has the potential to occur within the annual grassland vegetation community of the Study Area. Implementation of the following recommended measures would minimize impacts to Crotch's bumble bee:

- If the Crotch's bumble bee is no longer a Candidate or formally listed species under the California ESA at the time ground-disturbing activities occur, then no additional protection measures are proposed for the species.
- If the Crotch's bumble bee is legally protected under the California ESA as a Candidate or Listed species at the time ground-disturbing activities are scheduled to begin, preconstruction surveys shall be conducted in accordance with CDFW's Survey Considerations for California ESA Candidate Bumble Bee Species (CDFW 2023b) in the season immediately prior to Project implementation. A minimum of three Crotch's bumble bee preconstruction surveys shall be conducted at two- to four-week intervals during the colony active period (April through August) when Crotch's bumble bee are most likely to be detected. Non-lethal surveys shall be completed by a biologist who either holds a Memorandum of Understanding to capture and handle Crotch's bumble bee (if netting and chilling protocol is to be utilized), or by a CDFW-approved biologist who is experienced in identifying native bumble bee species (if surveys are restricted to visual surveys that will provide high-resolution photo documentation for species verification). The surveyor shall walk through all areas of suitable habitat focusing on areas with floral resources.

Surveys shall be completed at a minimum of one person-hour of searching per 3 acres of suitable habitat during suitable weather conditions (sustained winds less than 8 miles per hour, mostly sunny to full sun, temperatures between 65 and 90 degrees Fahrenheit) at an appropriate time of day for detection (at least one hour after sunrise and at least two hours before sunset, though ideally between 9:00 a.m. and 1:00 p.m.)

- If Crotch's bumble bees are detected, CDFW shall be notified by the designated biologist as further coordination may be required to avoid or mitigate certain impacts. At a minimum, two nesting surveys shall be conducted with focus on detecting active nesting colonies within one week and the final survey within 24 hours prior to ground-disturbing activities that are scheduled to occur during the flight season (February through October). If an active Crotch's bumble bee nest is detected, an appropriate no-disturbance buffer zone (including foraging resources and flight corridors essential for supporting the colony) shall be established around the nest to reduce the risk of disturbance or accidental take and the designated biologist shall coordinate with CDFW to determine if an Incidental Take Permit under Section 2081 of the California ESA will be required. Nest avoidance buffers may be removed at the completion of the flight season and/or once the qualified biologist deems the nesting colony is no longer active. If no nests are found but the species is present, a full-time qualified biological monitor shall be present during vegetation or ground-disturbing activities that are scheduled to occur during the queen flight period (February through March), colony active period (March through September), and/or gyne flight period (September through October). Because bumble bees move nest sites each year, two preconstruction nesting surveys shall be required during each subsequent year of construction, regardless of the previous year's findings, whenever vegetation and ground-disturbing activities are scheduled to occur during the flight season if nesting and foraging habitat is still present or has re-established.

5.2.3.1 Amphibians

Western spadefoot has the potential to occur within Sheep's Hollow and pond within the Study Area. Implementation of general recommendations and the following specific measure is recommended to avoid and/or minimize adverse effects on western spadefoot:

- A qualified biologist shall conduct at least one set (up to two sets spaced at least 10 days apart) of preconstruction daytime and nighttime surveys for all life stages of western spadefoot to be conducted when surface water is ponded in aquatic features if feasible between December through March (when suitable environmental conditions are met) prior to Project initiation. Surveys will be conducted during or following rain events and in nonfreezing temperatures. Daytime surveys of aquatic features will be conducted with the aid of binoculars and polarized sunglasses for all life stages of western spadefoot as well as adjacent upland habitat for burrowing adults and juveniles. Nighttime audio detection and eye-shine surveys will be conducted with the aid of binoculars and flashlight for calling males in and near aquatic features.
- A preconstruction survey report shall be prepared and submitted to the USFWS and CDFW, as appropriate, that includes the methods, results, and recommendations based on the survey. If the

preconstruction survey(s) are conducted according to the above methods and no detections of western spadefoot occur within the Study Area, then no further measures need to be taken. If the preconstruction survey(s) are conducted according to the above methods and there are detections of western spadefoot within the Study Area, then the qualified biologist will relocate the individuals to suitable breeding habitat (aquatic features that pond water for 30+ days) outside of the Study Area and the following measures will be implemented.

- No Project activities shall occur from 30 minutes before local sunset time to 30 minutes after local sunrise time, and 48 hours after a significant rain event with a National Weather Service forecast of greater than or equal to 0.5 inch of rainfall within a 24-hour period.
- No equipment or vehicle refueling, maintenance, or staging shall occur within 100 feet of an aquatic feature that represents western spadefoot breeding habitat, as determined by a qualified biologist. The Project will coordinate the location of the equipment and vehicle staging area with the qualified biologist.
- Wildlife exclusion fencing will be installed around aquatic features that represent western spadefoot breeding habitat and shall be checked daily by a qualified biologist to relocate encountered individuals and ensure the fencing is intact and functioning properly. Wildlife exclusion fencing installed around aquatic features with positive detections of western spadefoot will be installed 40 meters from the extent of the aquatic feature. Project personnel will allow any encountered individuals to leave the site on their own volition or will be relocated by a qualified biologist to suitable breeding habitat.
- Prior to installation of wildlife exclusion fencing, a qualified biologist will conduct a clearance survey of the aquatic features and associated upland habitat. Wildlife exclusion fencing shall be installed under supervision and direction of a qualified biologist to avoid small mammal burrow refugia to the greatest extent possible.
- Any erosion or sediment control devices (such as straw wattles or erosion blankets) implemented within 500 feet of aquatic features that represent western spadefoot breeding habitat shall not contain materials that could cause entanglement of western spadefoot such as monofilament or any other nonbiodegradable material.

5.2.3.2 Nesting Birds (including Raptors)

Two special-status birds and various other birds protected under the MBTA and California Fish and Game Code have the potential to nest within or in the vicinity of the Study Area. The following measures are recommended to minimize potential impacts to nesting special-status birds, and common species of nesting raptors and birds::

5.2.4 Swainson's Hawk

Swainson's hawk has the potential to occur within and immediately adjacent to the Study Area. In order to avoid potential impacts to Swainson's hawk, the following avoidance and minimization measures are recommended:

- If Project activities are scheduled during the Swainson's hawk nesting season (March 1 to August 31), then prior to beginning work on the Project a qualified biologist shall survey for Swainson's hawk nesting activity. The survey area shall include a 0.5-mile distance surrounding the Project site. The qualified biologist shall conduct surveys according to the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000) or, if proposing an alternate survey methodology, shall submit the proposed survey timing and methods to CDFW for review and written approval prior to initiation of surveys. Survey results shall be submitted to CDFW for review. If Swainson's hawk nesting activity is observed during the survey, then the survey results shall be submitted to CDFW for review and acceptance prior to starting Project activities. If the qualified biologist identifies nesting Swainson's hawks, then the biologist shall recommend a no-disturbance buffer, and the contractor shall implement the buffer under the supervision of a qualified biologist. Project activities shall be prohibited within the no-disturbance buffer between March 1 to August 31, unless otherwise approved in writing by CDFW, which may include consultation pursuant to California ESA, or a qualified biologist determining that the nest is no longer active. If there is a lapse in Project-related work of 14 days or longer, then an additional survey shall be conducted prior to resuming Project activities.

5.2.5 Burrowing Owl

Burrowing owls have a potential to occur in the annual grassland vegetation community within the Study Area. To avoid potential impacts to burrowing owl, the following avoidance and minimization measure is recommended:

- Protocol-level preconstruction surveys for burrowing owl shall be conducted by a qualified biologist within the Project Area and a 250-foot buffer around the Project Area in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). No further measures are necessary if the preconstruction surveys find that burrowing owl are not using the Project Area or within 250-feet of the Project Area. A report documenting the methods, results, and recommendations based on the results of the surveys shall be prepared.

- If the Project Area supports burrowing owl using burrows within the Project Area or within 250-feet of the Project Area, then project-related impacts shall be avoided to the greatest extent feasible and avoidance and minimization measures shall be developed and implemented prior to commencement of Project activities. If proposed project activities may impact owls or their burrows and exclusion and/or relocation measures are recommended by the biologist, then measures will be agreed upon in writing by CDFW prior to activities occurring within 250-feet of the burrows.

5.2.6 Nesting Birds and Raptors

Osprey, loggerhead shrike, yellow-billed magpie, oak titmouse, Lawrence's goldfinch, Bullock's oriole, and other MBTA-protected birds, including raptors, have the potential to nest within the Study Area. The following measure is recommended to minimize potential impacts to nesting birds and raptors:

- If construction is to occur during the nesting season (generally February 1 - August 31), conduct a pre-construction nesting bird survey of all suitable nesting habitat within 14 days prior to construction. The survey shall be conducted within a 500-foot radius of Project work areas for raptors and within a 100-foot radius for other nesting birds. If any active nests are observed, these nests shall be designated an environmentally sensitive area and protected by an avoidance buffer established in coordination with a qualified biologist until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

5.3 Special-Status and Day-Roosting Bats

5.3.1 Pallid Bat and Day Roosting Bats

Pallid bat and other species of day-roosting bats have the potential to occur within suitable day-roosting habitat in mature trees within the Study Area. In order to avoid potential impacts to pallid bat and other species of day-roosting bats the following avoidance and minimization measures are recommended:

- If trees are scheduled to be removed or trimmed, then a qualified bat biologist will conduct a bat habitat assessment for suitable bat roosting habitat prior to any construction activities; however, it is noted no tree removal is currently proposed. The habitat assessment should be conducted one year prior to the initiation of construction activities, if feasible, and no less than 30 days prior to the initiation of construction activities. If no suitable roosting habitat is identified, no further measures are necessary. If suitable roosting habitat and/or signs of bat use are identified during the assessment, the roosting habitat should be avoided to the extent possible.

- If avoidance of the identified bat roosting habitat is not feasible, then a qualified bat biologist will prepare a Bat Management Plan that will include specific avoidance and minimization measures to reduce impacts to roosting bats. The Bat Management Plan will be submitted to CDFW for approval prior to the removal of trees. The Project-specific Bat Management Plan shall include the requirement for an emergence and/or preconstruction survey for roosting bats, roost removal timing and methodology; and will include as necessary and appropriate the inclusion of acoustic monitoring, no-disturbance buffers, methods and materials for passive exclusion of bats, species-specific habitat replacement mitigation, and/or post-construction mitigation monitoring.

- Emergence surveys shall not be conducted during the bat inactive/hibernation period (typically October 15 through March 1, or when nighttime low temperatures are 45 degrees Fahrenheit or lower and rain is not over 0.5 inch in 24 hours), as bats are not detectable using emergence survey methods during their inactive period. If a maternity roost is located, that roost will remain undisturbed until after the maternity season or until a qualified biologist has determined the roost is no longer active.

- If tree removal/trimming occurs outside of the bat maternity season and outside of bat hibernation season, tree removal during the weather parameters described shall be conducted after bat exclusion has been installed and left in place for no less than three days prior to removal/trimming, or using the two-step tree removal methods described below:
  - As much as feasible, vegetation and trees within the area that are not suitable for roosting bats will be removed first to provide a disturbance that may reduce the likelihood of bats using the habitat.
  - Two-step tree removal will occur over two consecutive days under the supervision of a qualified bat biologist. On Day 1, small branches and small limbs containing no cavity, crevice, or exfoliating bark habitat on habitat trees (or outer fronds in the case of palm trees), as identified by a qualified bat biologist are removed first, using chainsaws only (i.e., no dozers, backhoes). The following day (Day 2), the remainder of the tree is to be felled/removed. The intention of this method is to disturb the tree with noise and vibration and branch removal on Day 1. This should cause any potentially present day-roosting bats to abandon the roost tree after they emerge for nighttime foraging. Removing the tree quickly the next consecutive day should avoid reoccupation of the tree by bats. If bats are observed during the two-step removal process, the biologist will be notified, the tree will be left until the next day, and the biologist will inspect the tree to ensure the tree does not contain bats prior to disturbance. If bats remain the following day, CDFW will be notified and measures will be submitted, such as methods for passive bat exclusion, for written acceptance prior to implementation and tree disturbance.
- If bat roost mitigation is required, roost mitigation will be installed as far in advance of the bat maternity season as possible, but no less than 30 days prior to roost removal.

5.3.2 Western Red Bat

Western red bat has the potential to occur in shrub and tree foliage within the Study Area. In order to avoid potential impacts to western red bat, the following avoidance and minimization measures are recommended:

- If shrubs or trees are proposed to be removed or trimmed and determined by a qualified bat biologist to be suitable day-roosting habitat for western red bat, then a qualified bat biologist will prepare a Bat Management Plan that will include specific avoidance and minimization measures to reduce impacts to roosting western red bats. The Bat Management Plan will be submitted to CDFW for approval prior to the removal of trees and shrubs. The Project-specific Bat Management Plan shall include the requirement for preconstruction acoustic surveys for western red bats, a requirement for a preconstruction survey report including methods, results, and recommendations based on the acoustic survey submitted to CDFW, roost removal timing outside of the maternity and hibernation seasons and methodology; and will include as necessary and appropriate the inclusion of no-disturbance buffers, methods and materials for bat deterrents, and/or species-specific habitat replacement mitigation.

5.4 Waters of the U.S./State

The Study Area potentially supports USACE jurisdictional and/or RWQCB jurisdictional aquatic features (Figure 4). If the Project proposes impacts to potentially jurisdictional USACE or RWQCB aquatic features, then the following measures are recommended to avoid or minimize impacts to Waters of the U.S./State:

- Prepare an aquatic resources delineation to USACE standards and obtain a verification and/or obtain a jurisdictional determination from the USACE and/or Waters of the State from the Central Valley RWQCB to determine the jurisdiction of the aquatic features within the Study Area.
- A permit authorization under Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Final Avoidance and Minimization Measures would be developed as part of the Section 404 Permit process to ensure no-net-loss of wetland function and values.
- A permit authorization from the Central Valley RWQCB pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Act must be obtained prior to the discharge of material in an area that could affect Waters of the U.S./State. Mitigation requirements for discharge to Waters of the U.S./State would be developed in consultation with the Central Valley RWQCB. If impacts are only proposed to State jurisdictional aquatic features, then obtain a waste discharger permit from the RWQCB.
- A Streambed Alteration Agreement (SAA) from CDFW pursuant to Section 1602 of the California Fish and Game Code must be obtained for impacts to features (e.g., the bed, channel, bank or riparian corridor of any river, stream, or lake) that may be subject to Section 1600 of the Fish and Game Code. The construction contractor shall adhere to all conditions outlined in the Section 1602 SAA.

6.0 REFERENCES

Bechard, M. J., C. S. Houston, J. H. Saransola, and A. S. England. 2020. Swainson's Hawk (*Buteo swainsoni*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.swahaw.01.

California Department of Fish and Game (CDFG). 2012. *Staff Report on Burrowing Owl Mitigation*. Dated March 7, 2012.

California Department of Fish and Wildlife (CDFW). 2024a. Biogeographic Information Observation System (BIOS). Available online at: BIOS Viewer@CDFW (ca.gov).

_____. 2024b. RareFind Natural Diversity Data Base Program. Version 5. California Department of Fish and Wildlife. California Natural Diversity Database. Available at: https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data. (Accessed April 2024).

_____. 2023a. California Natural Community List. Available online at FileHandler.ashx (ca.gov)

_____. 2023b. Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species. Available online at FileHandler.ashx (ca.gov)June 6. NEED REFERENCE PLEASE

_____. 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. California Natural Resources Agency, Sacramento, CA. November 24, 2009

California Native Plant Society (CNPS). 2024a. Rare Plant Inventory (online edition, v9-01 1.5). California Native Plant Society. Sacramento, CA. Available online: http://www.rareplants.cnps.org/. Accessed April 2024.

_____. 2024b. A Manual of California Vegetation, Online Edition. California Native Plant Society, Sacramento, CA. Available online at: https://vegetation.cnps.org/. Accessed April 2024.

_____. 2001. Inventory of Rare and Endangered Plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society, Sacramento, CA. 388pp.

Estep, J.A. 1989. *Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987*. California Department of Fish and Game, Nongame Bird and Mammal Section Report.

Goulson, D. 2010. *Bumblebees: Behaviour, Ecology, and Conservation*. Oxford University Press, New York. 317pp.

Hatfield, R., S. Colla, S. Jepsen, L. Richardson, R. Thorp, and S. F. Jordan. 2014. IUCN assessments for North American Bombus spp. Technical report for the North American IUCN Bumble Bee Specialist Group. Assessments completed 2014, document updated in February 2015. 56 pp.

Hartman, Ronald L. and Richard K. Rabeler. 2012. *Paronychia ahartii*, in Jepson Flora Project (eds.) Jepson eFlora. Available https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=36286. Accessed April 2024.

Jennings, M.R., and M.P. Hayes. 1994. *Amphibian and reptile species of special concern in California*. A Report to the California Department of Fish and Game, Rancho Cordova, California.

Jepson Flora Project (eds.) 2024. *Jepson eFlora*. Available online: https://ucjeps.berkeley.edu/eflora/. Accessed May 2024

National Oceanic and Atmospheric Administration (NOAA). 2024a. 2024a. National Climatic Data Center 1991-2020 Climate Normals for Chico Univ Farm, CA. Available at: https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-annualseasonal&timeframe=30&location=CA&station=USW00093205. Accessed April 2024.

_____. 2024b. Critical Habitat Mapper. National NMFS ESA Critical Habitat Mapper (arcgis.com).

_____. 2024c. NOAA EFH Mapper. Available online at: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_4.

Natural Resources Conservation Service (NRCS), U.S. Geological Survey, and Environmental Protection Agency. 2016. Watershed Boundary Dataset for California. Available online: https://datagateway.nrcs.usda.gov. [Dated 09/21/2016].

Philpott, W.L. 1996 (Year Approximate). *Natural Histories of California Bats*. U.S. Forest Service, 17 pages.

Poulin, R. G., L. D. Todd, E. A. Haug, B. A. Millsap, and M. S. Martell. 2020. Burrowing Owl (*Athene cunicularia*), version 1.0. In *Birds of the World* (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.burowl.01.

Stebbins, R. C. and S. M. McGinnis. 2012. *Field Guide to Amphibians and Reptiles of California (revised edition)*. University of California Press, Berkeley.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended timing and methodology for Swainson's hawk nesting surveys in California's Central Valley.

Thorp, R.W., D.S. Horning, and L.L Dunning. 1983. Bumble bees and cuckoo bumble bees of California (Hymenoptera: Apidae). *Bulletin of the California Insect Survey* 23:1-79 pp.

U.S. Fish and Wildlife Service (USFWS). 2024. USFWS Resource Report List. Information for Planning and Conservation.

_____. 2021. Birds of Conservation Concern 2021. USFWS, Division of Migratory Bird Management, Arlington, Virginia. (Online version available at https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf.

_____. 2006. Vernal Pool Recovery Plan: Species Account for Legenere. Sacramento, California: United States Department of the Interior, USFWS. Available online at Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon | U.S. Fish & Wildlife Service (fws.gov).

_____. 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. January.

U.S. Geological Survey. 2024. Richardson Springs, California 7.5-minute Quadrangle. United States Department of the Interior, Geological Survey, Denver.

Western Bat Working Group (WBWG). 2024. Western Bat Species Accounts. Available online: https://wbwg.org/western-bat-species/. Accessed April 2024

Williams, P.H., R.W. Thorp, L.L. Richardson, and S.R. Colla. 2014. *Bumble bees of North America: An Identification Guide*. Princeton University Press. 208 pp.

Xerces Society. 2018. A Petition to the State of California Fish and Game Commission. October. Available online at: https://xerces.org/sites/default/files/2019-10/CESA-petition-Bombus-Oct2018.pdf.

LIST OF APPENDICES

APPENDIX A

Results of Database Queries

Query Criteria: Quad IS (Richardson Springs (3912177) OR Campbell Mound (3912187) OR Cohasset (3912186) OR Hamlin Canyon (3912166) OR Chico (3912167) OR Paradise West (3912176) OR Nord (3912178) OR Richardson Springs NW (3912188) OR Ord Ferry (3912168))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAABF02020	***Spea hammondii*** western spadefoot	Proposed Threatened	None	G2G3	S3S4	SSC
AAABH01051	***Rana boylii pop. 1*** foothill yellow-legged frog - north coast DPS	None	None	G3T4	S4	SSC
AAABH01052	***Rana boylii pop. 2*** foothill yellow-legged frog - Feather River DPS	Threatened	Threatened	G3T2	S2	
ABNGA04010	***Ardea herodias*** great blue heron	None	None	G5	S4	
ABNGA04040	***Ardea alba*** great egret	None	None	G5	S4	
ABNKC01010	***Pandion haliaetus*** osprey	None	None	G5	S4	WL
ABNKC10010	***Haliaeetus leucocephalus*** bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC19070	***Buteo swainsoni*** Swainson's hawk	None	Threatened	G5	S4	
ABNKD06071	***Falco peregrinus anatum*** American peregrine falcon	Delisted	Delisted	G4T4	S3S4	
ABNME03041	***Laterallus jamaicensis coturniculus*** California black rail	None	Threatened	G3T1	S2	FP
ABNRB02022	***Coccyzus americanus occidentalis*** western yellow-billed cuckoo	Threatened	Endangered	G5T2T3	S1	
ABNSB10010	***Athene cunicularia*** burrowing owl	None	None	G4	S2	SSC
ABPAU08010	***Riparia riparia*** bank swallow	None	Threatened	G5	S3	
ABPBW01114	***Vireo bellii pusillus*** least Bell's vireo	Endangered	Endangered	G5T2	S3	
ABPBXB0020	***Agelaius tricolor*** tricolored blackbird	None	Threatened	G1G2	S2	SSC
AFCAA01031	***Acipenser medirostris pop. 1*** green sturgeon - southern DPS	Threatened	None	G2T1	S1	SSC
AFCHA0205L	***Oncorhynchus tshawytscha pop. 11*** chinook salmon - Central Valley spring-run ESU	Threatened	Threatened	G5T2Q	S2	
AFCHA0209K	***Oncorhynchus mykiss irideus pop. 11*** steelhead - Central Valley DPS	Threatened	None	G5T2Q	S2	SSC
AMACC01020	***Myotis yumanensis*** Yuma myotis	None	None	G5	S4	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AMACC02010	***Lasionycteris noctivagans*** silver-haired bat	None	None	G3G4	S3S4	
AMACC05032	***Lasiurus cinereus*** hoary bat	None	None	G3G4	S4	
AMACC05080	***Lasiurus frantzii*** western red bat	None	None	G4	S3	SSC
AMACC10010	***Antrozous pallidus*** pallid bat	None	None	G4	S3	SSC
AMACD02011	***Eumops perotis californicus*** western mastiff bat	None	None	G4G5T4	S3S4	SSC
AMAFJ01010	***Erethizon dorsatum*** North American porcupine	None	None	G5	S3	
ARAAD02030	***Emys marmorata*** western pond turtle	Proposed Threatened	None	G3G4	S3	SSC
ARACF12100	***Phrynosoma blainvillii*** coast horned lizard	None	None	G4	S4	SSC
ARADB36150	***Thamnophis gigas*** giant gartersnake	Threatened	Threatened	G2	S2	
CARA2442CA	***Central Valley Drainage Fall Run Chinook Stream*** Central Valley Drainage Fall Run Chinook Stream	None	None	GNR	SNR	
CARA2443CA	***Central Valley Drainage Hardhead/Squawfish Stream*** Central Valley Drainage Hardhead/Squawfish Stream	None	None	GNR	SNR	
CTT44110CA	***Northern Hardpan Vernal Pool*** Northern Hardpan Vernal Pool	None	None	G3	S3.1	
CTT44132CA	***Northern Volcanic Mud Flow Vernal Pool*** Northern Volcanic Mud Flow Vernal Pool	None	None	G1	S1.1	
CTT52410CA	***Coastal and Valley Freshwater Marsh*** Coastal and Valley Freshwater Marsh	None	None	G3	S2.1	
CTT61410CA	***Great Valley Cottonwood Riparian Forest*** Great Valley Cottonwood Riparian Forest	None	None	G2	S2.1	
CTT61420CA	***Great Valley Mixed Riparian Forest*** Great Valley Mixed Riparian Forest	None	None	G2	S2.2	
CTT61430CA	***Great Valley Valley Oak Riparian Forest*** Great Valley Valley Oak Riparian Forest	None	None	G1	S1.1	
CTT63410CA	***Great Valley Willow Scrub*** Great Valley Willow Scrub	None	None	G3	S3.2	
ICBRA03010	***Branchinecta conservatio*** Conservancy fairy shrimp	Endangered	None	G2	S2	
ICBRA03030	***Branchinecta lynchi*** vernal pool fairy shrimp	Threatened	None	G3	S3	
ICBRA03150	***Branchinecta mesovallensis*** midvalley fairy shrimp	None	None	G2	S2S3	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ICBRA06010	***Linderiella occidentalis*** California linderiella	None	None	G2G3	S2S3	
ICBRA10010	***Lepidurus packardi*** vernal pool tadpole shrimp	Endangered	None	G3	S3	
ICMAL05E10	***Stygobromus gallawayae*** Gallaway's amphipod	None	None	G1	S1	
IICOL48011	***Desmocerus californicus dimorphus*** valley elderberry longhorn beetle	Threatened	None	G3T3	S3	
IICOL49010	***Anthicus sacramento*** Sacramento anthicid beetle	None	None	G4	S4	
IICOL49020	***Anthicus antiochensis*** Antioch Dunes anthicid beetle	None	None	G3	S3	
IICOL58010	***Atractelmis wawona*** Wawona riffle beetle	None	None	G3	S1S2	
IIHYM24260	***Bombus pensylvanicus*** American bumble bee	None	None	G3G4	S2	
IIHYM24480	***Bombus crotchii*** Crotch's bumble bee	None	Candidate Endangered	G2	S2	
NLTES34580	***Scytinium siskiyouense*** Siskiyou jellyskin lichen	None	None	G2G3	S1S2	1B.1
PDAST11061	***Balsamorhiza macrolepis*** big-scale balsamroot	None	None	G2	S2	1B.2
PDAST1P090	***Calycadenia spicata*** spicate calycadenia	None	None	G3?	S3	1B.3
PDAST5L0A1	***Lasthenia glabrata ssp. coulteri*** Coulter's goldfields	None	None	G4T2	S2	1B.1
PDBOR0A0Q0	***Cryptantha crinita*** silky cryptantha	None	None	G2	S2	1B.2
PDBRA0K1B1	***Cardamine pachystigma var. dissectifolia*** dissected-leaved toothwort	None	None	G3G5T2Q	S2	1B.2
PDCAM060C0	***Downingia pusilla*** dwarf downingia	None	None	GU	S2	2B.2
PDCAR0L0V0	***Paronychia ahartii*** Ahart's paronychia	None	None	G3	S3	1B.1
PDCON04012	***Calystegia atriplicifolia ssp. buttensis*** Butte County morning-glory	None	None	G5T3	S3	4.2
PDEUP0D150	***Euphorbia hooveri*** Hoover's spurge	Threatened	None	G1	S1	1B.2
PDFAB0F8R3	***Astragalus tener var. ferrisiae*** Ferris' milk-vetch	None	None	G2T1	S1	1B.1
PDFAB62010	***Rupertia hallii*** Hall's rupertia	None	None	G2G3	S2S3	1B.2

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDLAM18082	***Monardella venosa*** veiny monardella	None	None	G1	S1	1B.1
PDLIM02042	***Limnanthes floccosa ssp. californica*** Butte County meadowfoam	Endangered	Endangered	G4T1	S1	1B.1
PDLIM02043	***Limnanthes floccosa ssp. floccosa*** woolly meadowfoam	None	None	G4T4	S3	4.2
PDMAL0H0R3	***Hibiscus lasiocarpos var. occidentalis*** woolly rose-mallow	None	None	G5T3	S3	1B.2
PDMAL110P0	***Sidalcea robusta*** Butte County checkerbloom	None	None	G2	S2	1B.2
PDONA050J1	***Clarkia gracilis ssp. albicaulis*** white-stemmed clarkia	None	None	G5T3	S3	1B.2
PDONA050Q2	***Clarkia mildrediae ssp. mildrediae*** Mildred's clarkia	None	None	G3T3?	S3?	1B.3
PDPGN086UY	***Eriogonum umbellatum var. ahartii*** Ahart's buckwheat	None	None	G5T3	S3	1B.2
PDSCR0D482	***Castilleja rubicundula var. rubicundula*** pink creamsacs	None	None	G5T2	S2	1B.2
PDSCR0R060	***Gratiola heterosepala*** Boggs Lake hedge-hyssop	None	Endangered	G2	S2	1B.2
PMALI040Q0	***Sagittaria sanfordii*** Sanford's arrowhead	None	None	G3	S3	1B.2
PMCYP0N060	***Rhynchospora californica*** California beaked-rush	None	None	G1	S1	1B.1
PMCYP0N080	***Rhynchospora capitellata*** brownish beaked-rush	None	None	G5	S1	2B.2
PMJUN011L2	***Juncus leiospermus var. leiospermus*** Red Bluff dwarf rush	None	None	G2T2	S2	1B.1
PMLEM03020	***Wolffia brasiliensis*** Brazilian watermeal	None	None	G5	S2	2B.3
PMLIL0D1S0	***Calochortus syntrophus*** Callahan's mariposa-lily	None	None	G2	S2	1B.1
PMLIL0V060	***Fritillaria eastwoodiae*** Butte County fritillary	None	None	G3Q	S3	3.2
PMLIL0V0F0	***Fritillaria pluriflora*** adobe-lily	None	None	G2G3	S2S3	1B.2
PMPOA3D020	***Imperata brevifolia*** California satintail	None	None	G3	S3	2B.1
PMPOA4G040	***Orcuttia pilosa*** hairy Orcutt grass	Endangered	Endangered	G1	S1	1B.1
PMPOA4G050	***Orcuttia tenuis*** slender Orcutt grass	Threatened	Endangered	G2	S2	1B.1

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PMPOA6N010	***Tuctoria greenei*** Greene's tuctoria	Endangered	Rare	G1	S1	1B.1
PMPOT03091	***Stuckenia filiformis ssp. alpina*** northern slender pondweed	None	None	G5T5	S2S3	2B.2

Record Count: 84

IPaC **U.S. Fish & Wildlife Service**

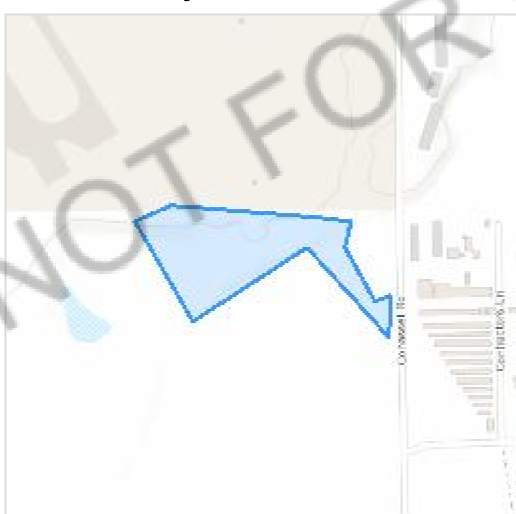
IPaC resource list

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.

Location

Butte County, California



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. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. 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:

Reptiles

NAME	STATUS
Northwestern Pond Turtle *Actinemys marmorata* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
Western Spadefoot *Spea hammondii* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5425	Proposed 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 — Endangered
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

Vernal Pool Fairy Shrimp Branchinecta lynchi — 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/498

Vernal Pool Tadpole Shrimp Lepidurus packardi — Endangered
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

Flowering Plants

NAME	STATUS
Butte County Meadowfoam Limnanthes floccosa ssp. californica Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4223	Endangered
Slender Orcutt Grass Orcuttia tenuis Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/1063	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.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
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

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

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.
https://ecos.fws.gov/ecp/species/1680

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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "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 (■)

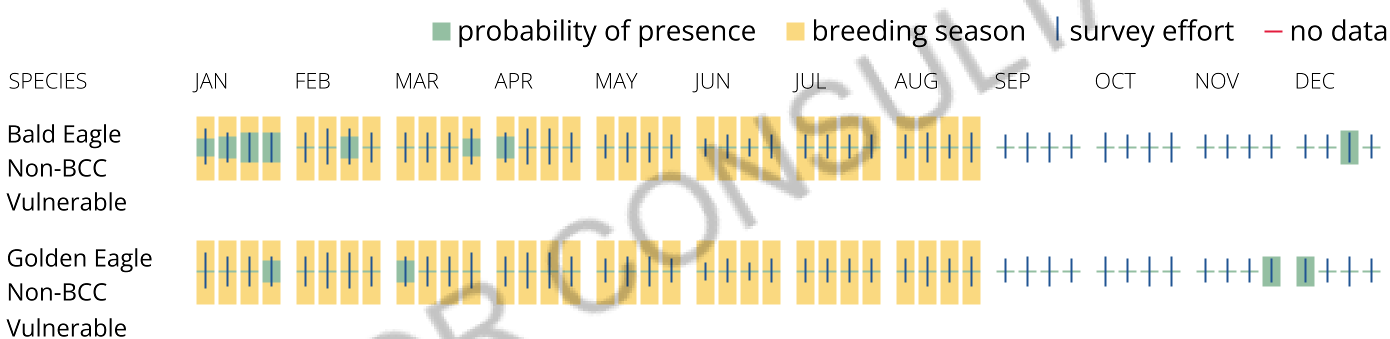
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence 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). To see 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 of bald and golden eagles 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 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. Please contact your local Fish and Wildlife Service Field Office if you have questions.

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[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

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, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
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
Cassin's Finch Haemorhous cassinii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
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

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

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.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Spinus 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

Long-eared Owl asio otus — Breeds Mar 1 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/3631

Northern Harrier Circus hudsonius — Breeds Apr 1 to Sep 15

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/8350

Nuttall's Woodpecker Dryobates 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

Santa Barbara Song Sparrow Melospiza melodia graminea — Breeds Mar 1 to Sep 5

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/5513

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

Western Screech-owl Megascops kennicottii cardonensis — Breeds Mar 1 to Jun 30

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "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.

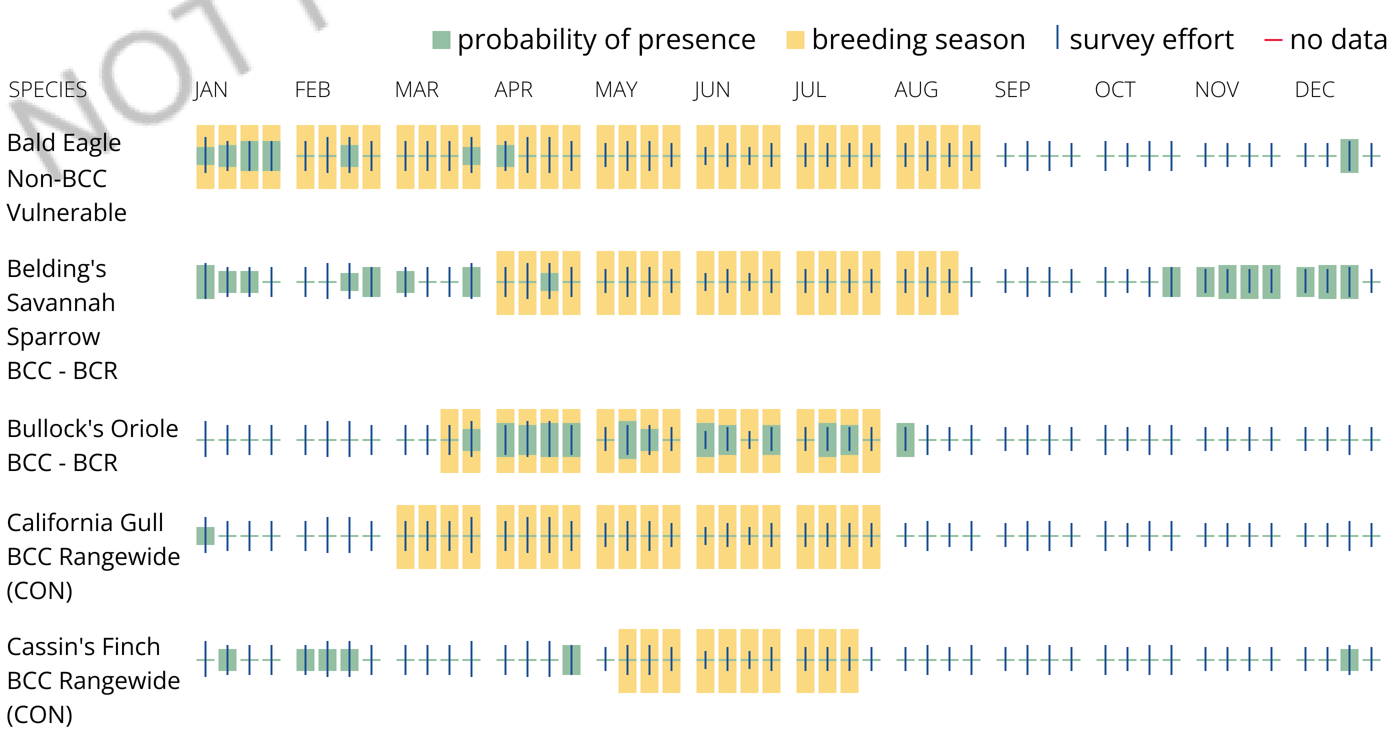
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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.



Common Yellowthroat
BCC - BCR

Golden Eagle
Non-BCC Vulnerable

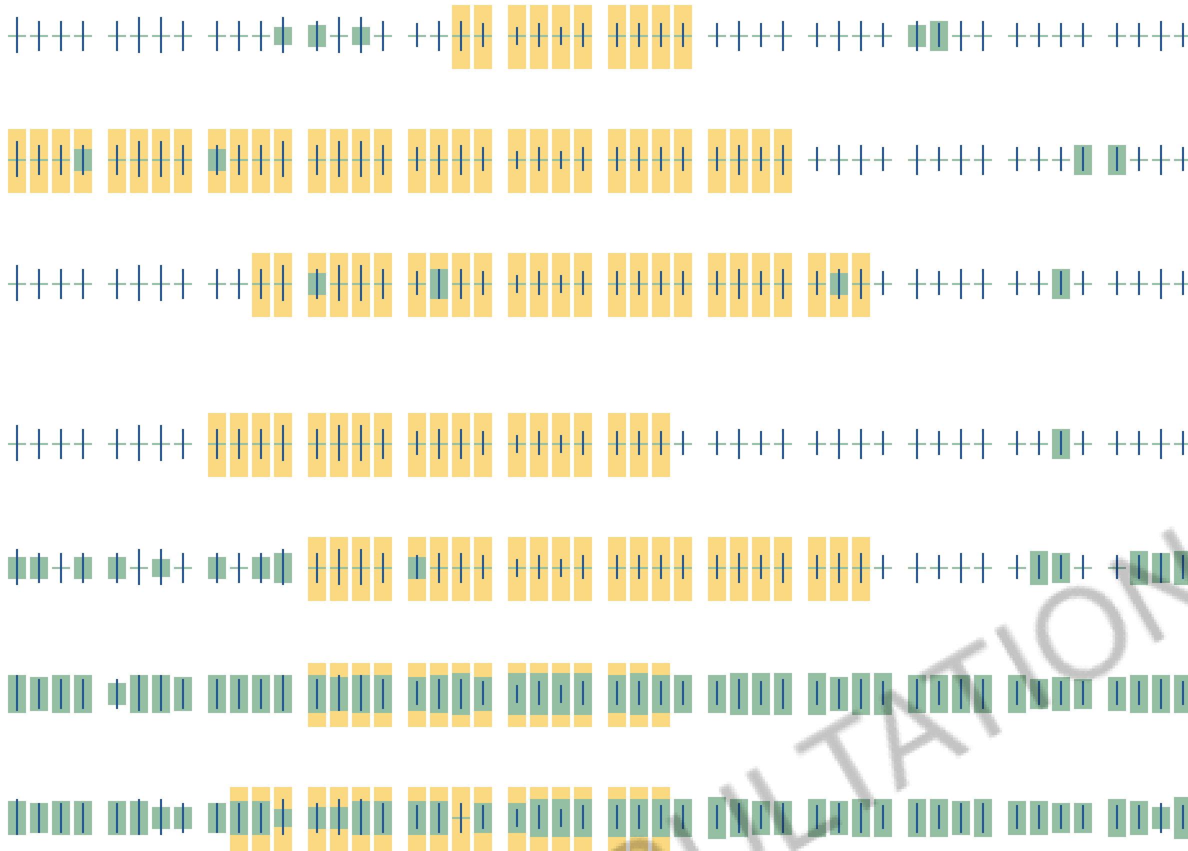
Lawrence's Goldfinch
BCC Rangewide (CON)

Long-eared Owl
BCC Rangewide (CON)

Northern Harrier
BCC - BCR

Nuttall's Woodpecker
BCC - BCR

Oak Titmouse
BCC Rangewide (CON)



SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Olive-sided Flycatcher
BCC Rangewide (CON)

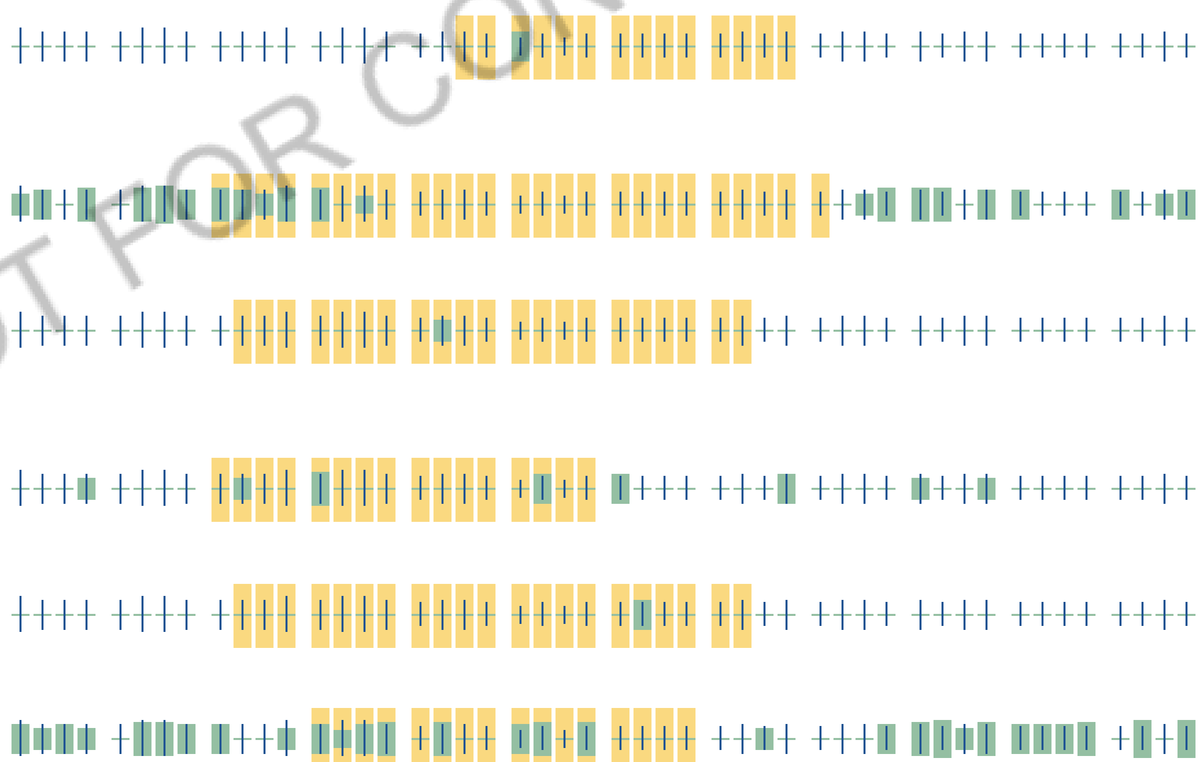
Santa Barbara Song Sparrow
BCC - BCR

Tricolored Blackbird
BCC Rangewide (CON)

Western Screech-owl
BCC - BCR

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.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1Kx

FRESHWATER POND
- PABKx

RIVERINE
- R4SBAx
- R5UBF

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

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.

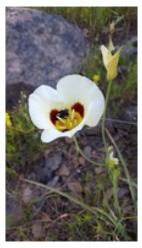
CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

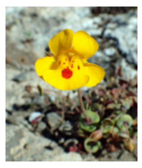
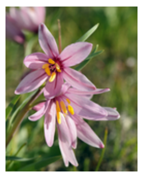
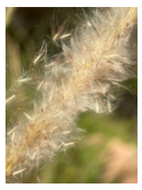
Search Results

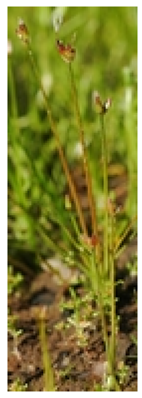
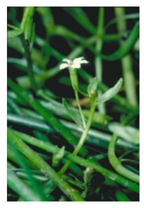
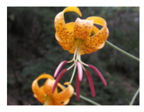
50 matches found. Click on scientific name for details

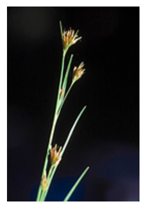
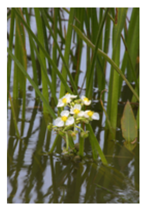
Search Criteria: 9-Quad include [**3912177:3912187:3912186:3912166:3912167:3912176:3912178:3912188:3912168**]

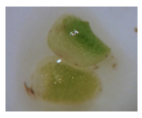
▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Allium sanbornii var. sanbornii	Sanborn's onion	Alliaceae	perennial bulbiferous herb	May-Sep	None	None	G4T4?	S3S4	4.2		1994-01-01	 ©2018 Steven Perry
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G4	S4	4.3	Yes	1974-01-01	 ©2012 Tim Kellison
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	None	None	G2T1	S1	1B.1	Yes	1994-01-01	No Photo Available
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual/perennial herb	Aug	None	None	G5	S4	4.2		1994-01-01	No Photo Available
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	 ©1998 Dean Wm. Taylor
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	Yes	2019-01-07	 © 2011 Steven Perry
Calochortus syntrophus	Callahan's mariposa-lily	Liliaceae	perennial bulbiferous herb	May-Jun	None	None	G2	S2	1B.1	Yes	2001-01-01	 ©2018 Julie Kierstead Nelson
Calycadenia oppositifolia	Butte County calycadenia	Asteraceae	annual herb	Apr-Jul	None	None	G3	S3	4.2	Yes	1974-01-01	No Photo Available

Calycadenia spicata	spicate calycadenia	Asteraceae	annual herb	May-Sep	None	None	G3?	S3	1B.3		2023-04-05	 © 2023 Christopher Bronny
Calystegia atriplicifolia ssp. buttensis	Butte County morning-glory	Convolvulaceae	perennial rhizomatous herb	May-Jul	None	None	G5T3	S3	4.2	Yes	1984-01-01	 ©2018 Sierra Pacific Industries
Cardamine pachystigma var. dissectifolia	dissected-leaved toothwort	Brassicaceae	perennial rhizomatous herb	Feb-May	None	None	G3G5T2Q	S2	1B.2	Yes	1988-01-01	No Photo Available
Castilleja rubicundula var. rubicundula	pink creamsacs	Orobanchaceae	annual herb (hemiparasitic)	Apr-Jun	None	None	G5T2	S2	1B.2	Yes	2001-01-01	 ©2010 Vernon Smith
Clarkia gracilis ssp. albicaulis	white-stemmed clarkia	Onagraceae	annual herb	May-Jul	None	None	G5T3	S3	1B.2	Yes	1994-01-01	No Photo Available
Clarkia mildrediae ssp. mildrediae	Mildred's clarkia	Onagraceae	annual herb	May-Aug	None	None	G3T3?	S3?	1B.3	Yes	1974-01-01	No Photo Available
Claytonia palustris	marsh claytonia	Montiaceae	perennial herb	May-Oct	None	None	G4	S4	4.3	Yes	1988-01-01	 ©2006 Dean Wm. Taylor, Ph.D.
Cryptantha crinita	silky cryptantha	Boraginaceae	annual herb	Apr-May	None	None	G2	S2	1B.2	Yes	1980-01-01	 ©2009 Sierra Pacific Industries
Cryptantha rostellata	red-stemmed cryptantha	Boraginaceae	annual herb	Apr-Jun	None	None	G4	S3	4.2		2018-06-26	No Photo Available
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		1980-01-01	 © 2013 Aaron Arthur

Eriogonum umbellatum var. ahartii	Ahart's buckwheat	Polygonaceae	perennial herb	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	2010-11-29	No Photo Available
Erythranthe glaucescens	shield-bracted monkeyflower	Phrymaceae	annual herb	Feb-Aug(Sep)	None	None	G3G4	S3S4	4.3	Yes	1974-01-01	 Neal Kramer 2020
Euphorbia hooveri	Hoover's spurge	Euphorbiaceae	annual herb	Jul-Sep(Oct)	FT	None	G1	S1	1B.2	Yes	1974-01-01	No Photo Available
Fritillaria eastwoodiae	Butte County fritillary	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3Q	S3	3.2		1974-01-01	 ©2009 Sierra Pacific Industries
Fritillaria pluriflora	adobe-lily	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2G3	S2S3	1B.2	Yes	1974-01-01	 © 2015 Steve Matson
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		1974-01-01	 ©2004 Carol W. Witham
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01	 © 2017 John Doyen
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	1974-01-01	 © 2020 Steven Perry
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	None	None	G3	S3	2B.1		2006-12-26	 © 2020 Matt C. Berger

Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	Juncaceae	annual herb	Mar-Jun	None	None	G2T2	S2	1B.1	Yes	1974-01-01	 ©2016 Dylan Neubauer
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	None	None	G4T2	S2	1B.1		1994-01-01	 © 2013 Keir Morse
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	Yes	1974-01-01	 ©2000 John Game
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2010 Aaron Schusteff
Lilium humboldtii ssp. humboldtii	Humboldt lily	Liliaceae	perennial bulbiferous herb	May-Jul(Aug)	None	None	G4T3	S3	4.2	Yes	1994-01-01	 © 2008 Sierra Pacific Industries
Limnanthes floccosa ssp. californica	Butte County meadowfoam	Limnanthaceae	annual herb	Mar-May	FE	CE	G4T1	S1	1B.1	Yes	1980-01-01	 © 2007 George W. Hartwell
Limnanthes floccosa ssp. floccosa	woolly meadowfoam	Limnanthaceae	annual herb	Mar-May(Jun)	None	None	G4T4	S3	4.2		1980-01-01	 © 2021 Scot Loring
Monardella venosa	veiny monardella	Lamiaceae	annual herb	May-Jul	None	None	G1	S1	1B.1	Yes	1984-01-01	 © 2007 George W. Hartwell
Navarretia heterandra	Tehama navarretia	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3		1974-01-01	 ©2021 Scot Loring
Orcuttia californica	California Orcutt grass	Poaceae	annual herb	Apr-Aug	FE	CE	G1	S1	1B.1		1974-01-01	No Photo Available

Orcuttia pilosa	hairy Orcutt grass	Poaceae	annual herb	May-Sep	FE	CE	G1	S1	1B.1	Yes	1980-01-01	 © 2003 George W. Hartwell
Orcuttia tenuis	slender Orcutt grass	Poaceae	annual herb	May-Sep(Oct)	FT	CE	G2	S2	1B.1	Yes	1974-01-01	 © 2013 Justy Leppert
Paronychia ahartii	Ahart's paronychia	Caryophyllaceae	annual herb	Feb-Jun	None	None	G3	S3	1B.1	Yes	1988-01-01	 © 2004 Carol W. Witham
Polygonum bidwelliae	Bidwell's knotweed	Polygonaceae	annual herb	Apr-Jul	None	None	G4	S4	4.3	Yes	1974-01-01	 ©2020 Neal Kramer
Rhynchospora californica	California beaked-rush	Cyperaceae	perennial rhizomatous herb	May-Jul	None	None	G1	S1	1B.1	Yes	1974-01-01	 © 2004 Steve Matson
Rhynchospora capitellata	brownish beaked-rush	Cyperaceae	perennial herb	Jul-Aug	None	None	G5	S1	2B.2		1974-01-01	 ©2004 Dean Wm. Taylor
Rupertia hallii	Hall's rupertia	Fabaceae	perennial herb	Jun-Aug(Sep)	None	None	G2G3	S2S3	1B.2	Yes	1994-01-01	No Photo Available
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01	 ©2013 Debra L. Cook
Scytinium siskiyouense	Siskiyou jellyskin lichen	Collemataceae	foliose lichen		None	None	G2G3	S1S2	1B.1		2022-10-13	No Photo Available

Sidalcea robusta	Butte County checkerbloom	Malvaceae	perennial rhizomatous herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2010 George W Hartwell
Stuckenia filiformis ssp. alpina	northern slender pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	None	None	G5T5	S2S3	2B.2		1994-01-01	 Dana York (2016)
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	FE	CR	G1	S1	1B.1	Yes	1974-01-01	 ©2008 F. Gauna
Wolffia brasiliensis	Brazilian watermeal	Araceae	perennial herb (aquatic)	Apr-Dec	None	None	G5	S2	2B.3		2001-01-01	 © 2021 Scot Loring

Showing 1 to 50 of 50 entries

Suggested Citation:
California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 26 April 2024].

Quad Name **Richardson Springs**
Quad Number **39121-G7**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
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 - **X**
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 -

APPENDIX B

Representative Photographs

Photo 1. Overview of Wastewater Ponds.

Photo 2. View of wastewater pond to the left and levee to the right.

Photo 3. Outlet Culverts of intermittent drainage.

Photo 4. View of Sheep's Hollow looking southwest.

Photo 5. View of Sheep's Hollow looking northeast.

Photo 6. View of two culverts under Cohasset Road, and view of seasonal swale.

Photo 7. View of wastewater ponds.

Photo 8. View of riparian vegetation on the south side of Sheep's Hollow.

APPENDIX C

Plant Species Observed

Common Name	***Scientific Name***
Jointed charlock	*Raphanus raphanistrum*
Curly dock	*Rumex crispus*
Wild oats	*Avena fatua*
Italian thistle	*Carduus pycnocephalus*
Valley Oak	*Quercus lobata*
Yellow Starthistle	*Centaurea solstitialis*
Foxtail barley	*Hordeum murinum*
March purslane	*Ludwigia peploides*
Tumbleweed	*Amaranthus albus*
Field bindweed	*Convolvulus arvensis*
Lambs quarters	*Chenopodium album*
Big heron bill	*Erodium botrys*
Gumweed	*Grindelia camporum*
Milk thistle	*Silybum marianum*
Soft chess	*Bromus hordeaceus*
Fremont cottonwood	*Populus fremontii*
Common cocklebur	*Xanthium orientale*
Smartweed	*Persicaria* sp.
Hawkbit	*Leontodon saxatilis*
Rattlesnake grass	*Briza maxima*
Willow	*Salix* sp.
Wire rush	*Juncus balticus*
Rose clover	*Trifolium hirtum*
Coyote thistle	*Eryngium vaseyi*
Himalayan blackberry	*Rubus armeniacus*
Spikerush	*Eleocharis macrostachya*
Italian rye grass	*Festuca perennis*

APPENDIX D

Wildlife Species Observed

Common Name	***Scientific Name***
Swainson's Hawk	*Buteo swainsoni*
Jack Rabbit	*Lepus californicus*
Killdeer	*Charadrius vociferus*

APPENDIX C

Aquatic Resources Delineation for the Chico Airport Pond Sewer Repair Project, ECORP Consulting Inc., October 2025

Aquatic Resources Delineation for the Chico Airport Pond Sewer Repair Project

Butte County, California

Prepared For:

City of Chico, Public Works Department

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
55 Hanover Lane, Suite A
Chico, CA 95973

October 7, 2025

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Definition**
˚F	degrees Fahrenheit
Agencies	U.S. Environmental Protection Agency and Department of the Army
ARD	Aquatic Resources Delineation
CWA	Clean Water Act
ECORP	ECORP Consulting, Inc.
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FR	Federal Register
GPS	Global Positioning System
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High Water Mark
PJD	Preliminary Jurisdictional Determination
RWQCB	Regional Water Quality Control Board
Study Area	Approximately 11.85-Acre Study Area for the Chico Airport Pond Sewer Repair Project
UPL	Upland
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

On behalf of City of Chico Public Works Department, ECORP Consulting, Inc. (ECORP) conducted an Aquatic Resources Delineation (ARD) for the approximately 11.85-acre Project Area of the proposed Chico Airport Pond Sewer Repair Project (Study Area) located in the City of Chico, Butte County, California. The Study Area is located south of the Chico Regional Airport and west of Cohasset Road (Figure 1). The Study Area corresponds to a portion of Section 03 of Township 22 North, and Range 01 East (Mount Diablo Base and Meridian) of the "Richardson Springs, California" 7.5-minute quadrangle (U.S. Geological Survey 1970). The approximate center of the Study Area is located at 39.786141° latitude and -121.847005° longitude and is located within the Big Chico Creek-Sacramento River Watershed (Hydrologic Unit Code #18020157; Natural Resources Conservation Service [NRCS] et al. 2016). Driving directions to the Study Area are included as Appendix A.

This report describes aquatic resources identified within the Study Area that may be regulated by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the federal Clean Water Act (CWA). The information presented in this report provides data required by the USACE Sacramento District's Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2016a). The aquatic resource boundaries depicted in this report represent a calculated estimation of the jurisdictional area within the Study Area and are subject to modification following the USACE verification process. This ARD documents current site conditions and is intended to provide adequate information to USACE for the issuance of a Preliminary Jurisdictional Determination (PJD).

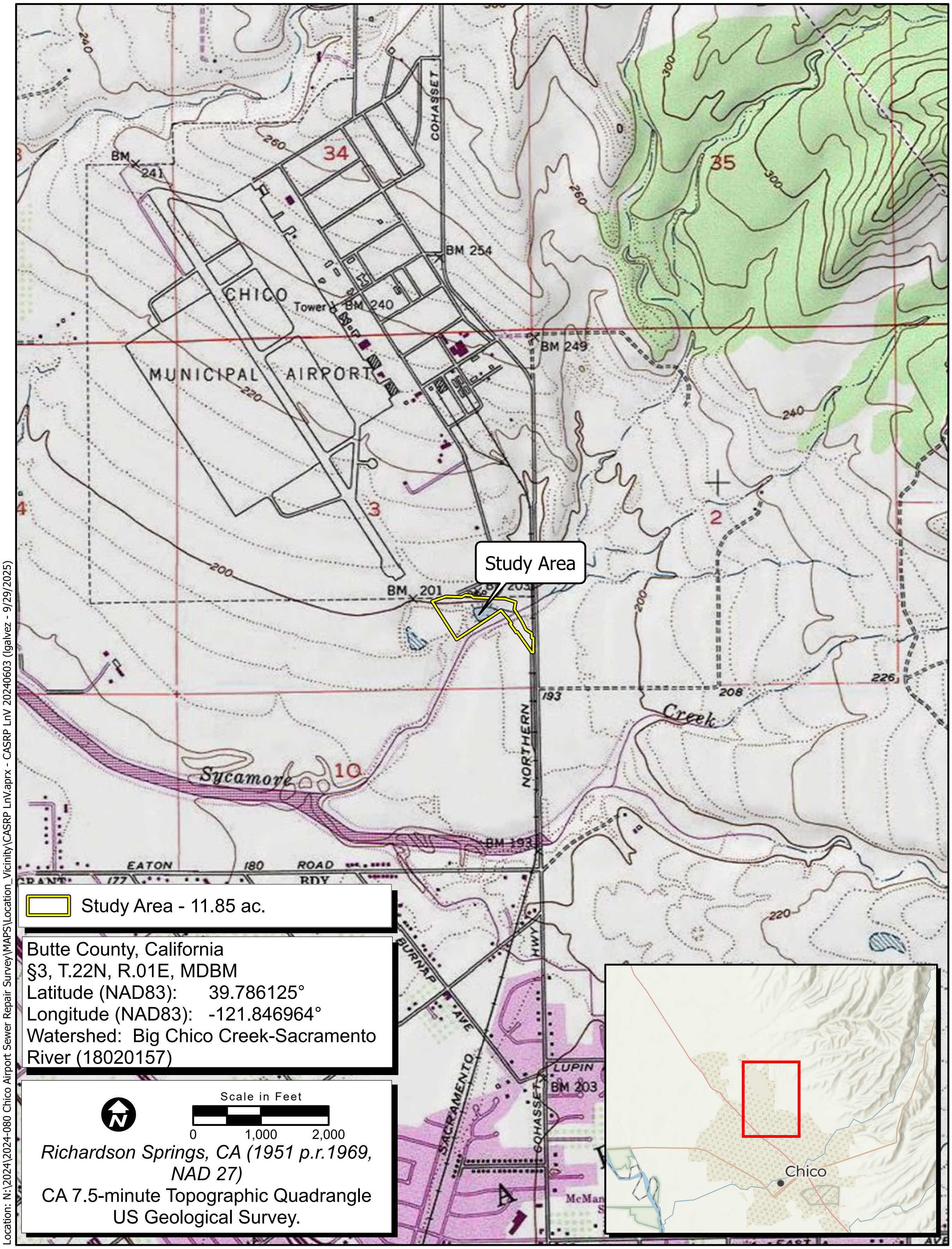
1.1 Project Description

The City of Chico proposes to make improvements to the Chico Airport sewer system to address deficiencies in the system. To reduce the volume of stormwater from entering the nearby pond, the Project proposes to abandon ±510 feet of existing storm drain line segments and install a new storm drain line that would outfall stormwater into the existing unnamed drainage channel. The installation of the new storm drain line would reestablish the storm water diversion to the unnamed drainage channel, rather than passing through the pond.

The installation of the new storm drain line would include a 12-inch, ±349-foot high-density polyethylene (HDPE) storm drain line. The proposed new storm drain line would connect the existing drainage inlet to a storm drain outlet into the existing unnamed drainage channel that drains into Sheep Hollow Creek. The outfall elevation of the proposed storm drainage pipe is set above the OHWM.

To install the proposed storm drainpipe traversing from the existing drainage inlet to the drainage channel, the vegetation along the proposed alignment would be cleared and properly disposed of offsite. Following clear and grub, a trench measuring approximately 7 feet wide at depth would be dug. The storm drainpipe would then be placed and backfilled, and soils compacted. The pipe would then be pressure tested. Following successful pressure testing, the ground surface would be restored to pre-Project grades.

A construction staging area for the installation of the proposed storm drainpipe would be established just east of the former wastewater treatment plant infrastructure where materials, equipment, and tools will be



Map Date: 9/29/2025
Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-138.02A Chico Airport Pond Sewer Repair Project

temporarily stored. Access to the Project area will be accessed off the entrance driveway, mainly utilized for access to the City of Chico Compost Facility at 4441 Cohasset Road. Temporary signage will be placed where construction vehicles will enter and leave the public right-of-way (ROW) to notify the public of the approaching work zone and the potential for construction vehicles and controlled traffic conditions.

The Project proposes to replace an existing plug valve with a 12-inch gate valve and install a level sensor in the existing junction box, along the existing alignment of the 12-inch sanitary sewer pipe main, located north of Sheep Hollow Creek. Installation of the proposed sewer pipe infrastructure will be limited to accessing the existing buried junction box and will not include significant ground-disturbing excavation. The proposed installation of infrastructure will support the efficiency of the sanitary sewer system by monitoring and controlling the flow of wastewater to avoid overflow and spills.

The Project proposes a new sewer manhole to be installed within the alignment of the existing 12-inch sewer main. The proposed location of the manhole will be approximately 150-200 feet south of the existing Federal levee, on the south side of Sheep Hollow Creek, and will avoid encroachment of the levee easement limits. The manhole will be installed to allow for maintenance access to the existing sewer siphon system.

Installation of the proposed manhole would include clear and grub at the proposed location, south of the Federal levee. Following clear and grub, excavation to reach the required depth of the 12-inch sewer pipeline will occur to allow for proper placement of the new concrete manhole

To access the proposed manhole, a 15-foot access road is proposed to be constructed over the alignment of the existing 12-inch sewer main on the southerly side of the levee. The proposed access road will be accessed from Cohasset Road, through construction of an independent driveway to service the access road. The access road will be graded down to a slope of 2H:1V and surfaced with crushed rock along the length of the route. A turnaround will be constructed at the end of the access road, ensuring a buffer from the Federal levee easement limits.

A construction staging area for the installation of the proposed sewer pipe manhole and access road would be established just west of the existing Federal levee entrance driveway off Cohasset Road. The staging area will be the site where materials, equipment, and tools will be temporarily stored. Refueling, lubrication, or maintenance of construction vehicles will only be permitted within the construction staging area. Temporary signage will be placed where construction vehicles will enter and leave the public ROW to notify the public of the approaching work zone and the potential for construction vehicles and controlled traffic conditions. Should Project construction require activity within a public ROW or easement, an encroachment permit would be obtained.

2.0 REGULATORY SETTING

2.1 Waters of the United States

This report describes aquatic resources, including wetlands, that may be regulated by the USACE under Section 404 and/or the Regional Water Quality Control Board (RWQCB) under Section 401 of the federal CWA. The following sections define these regulations.

2.1.1 Wetlands

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (51 Federal Register [FR] 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993). Wetlands can be perennial or intermittent.

2.2 Clean Water Act

The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines [33 Code of Federal Regulations Section 328.2(f)]. In addition, Section 401 of the CWA (33 U.S. Code 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect wetlands (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the RWQCB.

2.3 Jurisdictional Assessment

On December 22, 2022, the U.S. Environmental Protection Agency and Department of the Army (Agencies) announced a final rule defining Waters of the U.S. The definition was founded upon the pre-2015 "Rapanos" decision, updated to reflect consideration of U.S. Supreme Court decisions, the science, and the Agencies' technical expertise. The final rule was published in the FR on January 18, 2023 and effective as of March 20, 2023.

On May 25, 2023, the U.S. Supreme Court adopted a narrower definition of Waters of the U.S. in the case *Sackett v. Environmental Protection Agency*. Under the majority opinion, Waters of the U.S. refers to "geographical features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes' and to adjacent wetlands that are 'indistinguishable' from those bodies of water due to a continuous surface connection."

On August 29, 2023, the Agencies issued a final rule to amend the final "*Revised Definition of 'Waters of the United States*'" rule, published in the FR on January 18, 2023. This final rule conforms the definition of *Waters of the U.S.* to the U.S. Supreme Court's May 25, 2023 decision in the case of *Sackett v. Environmental Protection Agency*. Parts of the January 2023 Rule are invalid under the Supreme Court's interpretation of the CWA in the Sackett decision. Therefore, the Agencies have amended key aspects of the regulatory text to conform to the Court's decision.

The conforming rule became effective upon publication in the FR on September 9, 2023. Where the January 2023 Rule is not enjoined, the agencies will implement the January 2023 Rule, as amended by the conforming rule.

In summary, under the conforming rule, the term Waters of the U.S. mean:

- waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- the territorial seas;
- interstate waters;
- impoundments of waters otherwise defined as waters of the United States under this definition;
- tributaries of a) Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, b) the territorial seas, and c) interstate waters;
- wetlands adjacent to a) Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, b) the territorial seas, and c) interstate waters; or
- wetlands adjacent (defined as having a continuous surface connection) to relatively permanent, standing or continuously flowing bodies of water identified as impoundments of waters and with a continuous surface connection to those waters; or
- intrastate lakes and ponds that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters previously identified.

Waters excluded from this definition include prior converted cropland (defined by the U.S. Department of Agriculture), waste treatment systems, ditches (including roadside ditches) excavated wholly in and draining only dry land, artificially irrigated areas that would revert to dry land if the irrigation ceased, artificial lakes or ponds, artificial reflecting pools or swimming pools, waterfilled depressions (e.g., created in dry land incidental to construction activity, pits excavated in dry land for purposes of obtaining fill, sand, or gravel), swales and erosional features (e.g., gullies, small washes) that are characterized by low volume, infrequent, or short duration flow).

2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of storm water runoff associated with construction activities. General Construction Permits for projects that disturb 1 or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve “discharging waste, or proposing to discharge waste, with any region that could affect the water of the state” (Water Code 13260[a]). Waters of the State are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code

13050[e]). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State that are not regulated by the USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of Waste Discharge Requirements for these activities.

3.0 METHODS

This ARD was conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008a). Non-wetland waters were identified in the field according to A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008b), where applicable. The boundaries of aquatic resources were delineated through standard field methods (e.g., paired sample set analyses) and aerial photograph interpretation. Field data were recorded on *Wetland Determination Data Forms – Arid West Region* and *Arid West Ephemeral and Intermittent Streams OHWM Datasheet* (Appendix B). Munsell Soil Color Charts (Munsell Color 2009) and the Web Soil Survey (NRCS 2025a) were used to aid in identifying hydric soils in the field. The Jepson eFlora (Jepson Flora Project [eds.] 2022) was used for plant nomenclature and identification.

The field survey was conducted on March 18, 2025 by ECORP Senior Biologists Dan Machek and Laurens Kuypers. The biologists walked the entire Study Area to assess the site conditions of the Study Area and collect ARD data. Aquatic resources within the Study Area were recorded in the field using a post-processing capable Global Positioning System (GPS) unit with submeter accuracy (e.g., Android, Collector for ArcGIS application with Geode GNS3 submeter GPS unit with real-time correction).

3.1 Routine Determinations for Wetlands

To be determined a wetland, the following three criteria must be met:

- A majority of dominant vegetation species are wetland-associated species.
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.
- Hydric soils are present.

3.1.1 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase "a prevalence of vegetation typically adapted for life in saturated soil conditions." Prevalent vegetation is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The dominance test is the basic hydrophytic vegetation indicator and was applied at each sampling point location. The "50/20 rule" was used to select the dominant plant species from each stratum of the community. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional species that individually comprise 20 percent or more of the total cover in the stratum (USACE 1992, 2016a).

Dominant plant species observed at each sampling point were then classified according to their indicator status (probability of occurrence in wetlands; Table 1), *National Wetland Plant List* (USACE 2022). If the majority (more than 50 percent) of the dominant vegetation on a site are classified as Obligate (OBL), Facultative Wetland (FACW), or Facultative (FAC), rather than Facultative Upland (FACU) or Upland (UPL), the site was considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species[1]

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	Almost always occur in wetlands
Facultative Wetland	FACW	Usually occur in wetlands, but may occur in nonwetlands
Facultative	FAC	Occur in wetlands and nonwetlands
Facultative Upland	FACU	Usually occur in nonwetlands, but may occur in wetlands
Upland	UPL	Almost never occur in wetlands
Plants That Are Not Listed (assumed upland species)	N/L	Does not occur in wetlands in any region.

Source: [1]U.S. Army Corps of Engineers 2022

In instances where indicators of hydric soil and wetland hydrology were present, but the plant community failed the dominance test, the vegetation was reevaluated using the Prevalence Index. The Prevalence Index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighting is by abundance (percent cover). If the plant community failed the Prevalence Index, the presence/absence of plant morphological adaptations to prolonged inundation or saturation in the root zone was evaluated.

3.1.2 Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2003). Indicators that a hydric soil is present include, but are not limited to, histosols, histic epipedon, hydrogen sulfide, depleted below dark surface, sandy redox, loamy gleyed matrix, depleted matrix, redox dark surface, redox depressions, and vernal pools.

A soil pit was excavated at each sampling point to the depth needed to document an indicator, to confirm the absence of indicators, or until refusal at each sampling point. The soil was then examined for hydric soil indicators. Soil colors were determined while the soil was moist using the *Munsell Soil Color Charts* (Munsell Color 2009). Hydric soils are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. These processes and the features in the soil that develop can be identified by looking at the color and texture of the soils.

3.1.3 Hydrology

Wetlands, by definition, are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include, but are not limited to, visual observation of saturated soils, visual observation of inundation, surface soil cracks, inundation visible on aerial imagery, water-stained leaves, oxidized rhizospheres along living roots, aquatic invertebrates, water marks (secondary indicator in riverine environments), drift lines (secondary indicator in riverine environments), and sediment deposits (secondary indicator in riverine environments). The occurrence of one primary indicator is sufficient to conclude that wetland hydrology is present. If no primary indicators are observed, two or more secondary indicators are required to conclude wetland hydrology is present. Secondary indicators include, but are not limited to, drainage patterns, crayfish burrows, FAC-neutral test, and shallow aquitard.

4.0 RESULTS

4.1 Existing Site Conditions

The Study Area is located within relatively flat to gently rolling terrain situated at an elevational range of approximately 194 to 203 feet above mean sea level in the Sacramento Valley subregion of the Great Central Valley region of the California Floristic Province (Baldwin et al. 2012). At the National Oceanic and Atmospheric Administration data reporting station located in the city of Orland, approximately 18 miles west of the Study Area, the average winter temperature is 48.4 degrees Fahrenheit (˚F) and the average summer temperature is 76.8 ˚F. Average annual precipitation is approximately 21.39 inches, which falls as rain (National Oceanic and Atmospheric Administration 2025).

The Study Area is located south of the Chico Regional Airport and west of Cohasset Road. Land uses adjacent to the Study Area includes the Chico Regional Airport and a City of Chico Composting Facility to the north. There are various commercial businesses east of Cohasset Road. Open grassland occurs to the south of the Study area and graded grassland of the Chico Regional Airport runway occurs west of the Study Area.

A wastewater and stormwater detention basin occurs within the Study Area. The feature is directly associated with the City of Chico Composting facility and was created entirely in upland without influence of any aquatic features. The detention basin has no surface water connection to any aquatic features and drains the surrounding upland — functioning as a tertiary detention basin to contain compost affluent runoff from the upslope facility. The inlet to the detention basin consists of a slight erosional ditch that receives runoff from a compost staging yard, and discharges to the detention basin via two culverts: one high volume culvert that drains vertically to the detention basin, and a secondary culvert that drains overflow surface runoff to the detention basin. This feature functions as an actively maintained treatment facility and therefore is not considered to be an aquatic feature.

The majority of the Study Area is composed of annual grassland that is best characterized as an *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance, a vegetation community consisting of annual, non-native grass species prevalent throughout the region. Dominant species observed within this community includes wild oats (*Avena fatua*), Italian ryegrass (*Festuca perennis*), brome grass (*Bromus* sp.), and barley (*Hordeum* sp.) intermixed with red stem fillarae (*Erodium cicutarium*), and common fiddlehead (*Amsinckia intermedia*). Developed/disturbed areas were present throughout much of the Study Area, including maintained access roads, a waste-water treatment detention basin, and USACE levee systems with associated stormwater drainages. Some areas of disturbed upland in the north of the Study Area exhibited dense patches of ruderal herbaceous species, including Italian thistle (*Carduus pycnocephalus*) and Yellow star thistle (*Centaurea solstitialis*). A sparse number of Valley oaks (*Quercus lobata*) and black locust (*Robinia pseudoacacia*) occur in proximity to Sheep Hollow Creek; however no portion of the Study Area is characterized as woodland.

The site assessment for this ARD was conducted during the spring outside of the blooming season for most plant species, especially for identification of grasses to a species-level; however, most plants were identifiable by their vegetative and old fruit/seed morphology. This delineation was performed during an acceptable time of year to observe wetland hydrology. The survey was conducted during warm and sunny conditions within 72 hours of spring showers.

The Antecedent Precipitation Tool (APT), developed by the USACE, was run for the Study Area and for the date the field delineation data were collected, March 18, 2025. The APT demonstrated the site conditions on this date represents a time of year referenced as the wet season and that site conditions were normal in climatic conditions (USACE 2025; Appendix C).

4.1.1 National Wetlands Inventory

The National Wetlands Inventory (NWI) (U.S. Fish and Wildlife Service [USFWS] 2025) is a nationwide map and database of surface waters and related habitats. The NWI includes aquatic resource features mapped using a variety of remote sensing and modeling techniques. As such, these aquatic features may or may not exist as represented. In addition, NWI data varies in detail, accuracy, and age, and is meant to be used as a tool to assist with an ARD but not as the only source of information.

Review of the NWI showed four mapped aquatic features within the Study Area. The NWI mapping indicates the presence of a riverine and pond feature, and two segments of freshwater emergent wetland within the Study Area (USFWS 2025; Figure 2).

4.1.2 Soils

According to the Web Soil Survey (NRCS 2025 a), four soil units, or types, have been mapped within the Study Area (Figure 3).

- 300 - Redsluff gravely loam, 0 to 2 percent slopes;
- 301 - Wafap-Hamslough, 0 to 2 percent slopes;
- 302 - Redtough-Redswale, 0 to 2 percent slopes;

Map Contents

Study Area - 11.85 ac.

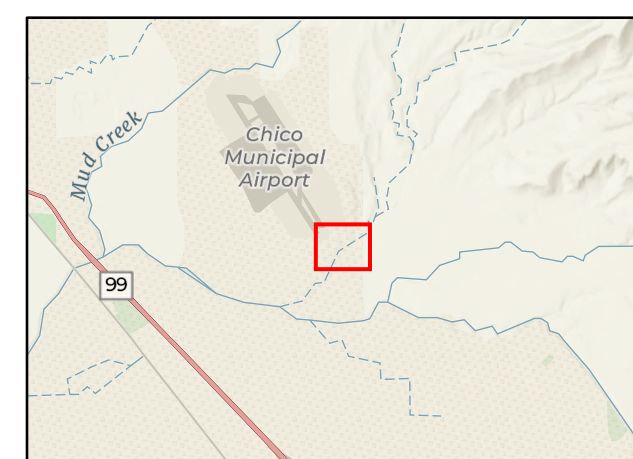
NWI Type

Freshwater Emergent Wetland

Freshwater Pond

Riverine

Sources: Maxar, Esri World Imagery, NWI 2024



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aquatic_Resources\CASRP Aquatic Resources.aprx - CASRP NWI 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 2. National Wetlands Inventory

2024-138.02A Chico Airport Pond Sewer Repair Project

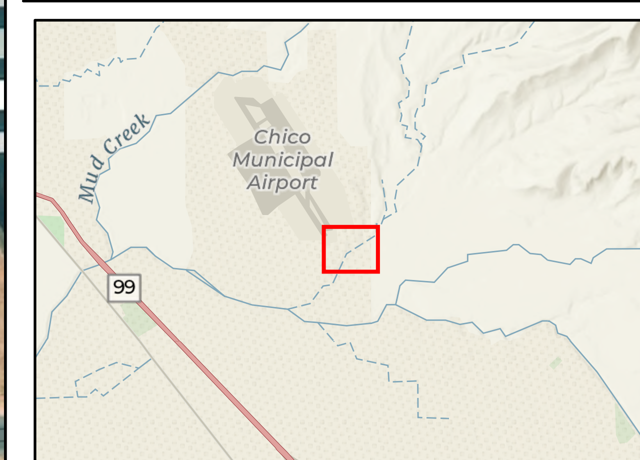
Map Contents

Study Area - 11.85 ac.

Series Number - Series Name

- 300 - Redsluff gravelly loam, 0 to 2 percent slopes
- 301 - Wafap-Hamslough , 0 to 2 percent slopes
- 302 - Redtough-Redswale , 0 to 2 percent slopes
- 991 - Xerofluvents and 0 to 4 percent slopes frequently flooded

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for BUTTE, CA



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Soils_and_Geology\CASRP Soils.aprx - CASRP Soils 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 3. Natural Resources Conservation Service Soil Types

2024-138.02A Chico Airport Pond Sewer Repair Project

- 991 - Xerofluvents, 0 to 4 percent slopes, frequently flooded.

The Redsluff series consists of fine-loamy alluvium derived from igneous, metamorphic and sedimentary rock over gravelly alluvium derived from volcanic rock. These soils occur in relatively flat landforms with slopes of 0 to 2 percent within swales of fan remnants. These soils exhibit hydric components and have a slow infiltration rate when thoroughly wet because these soils typically have a layer that impedes the downward movement of water and material of moderately fine texture or fine textures (NRCS 2025b).

The Wafap-Hamslough series consists of gravelly and clayey alluvium over cobbly channel alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock. These soils occur in relatively flat landforms with slopes of 0 to 2 percent within channels in stream terraces. These soils exhibit hydric components and have a low infiltration rate and high runoff potential when thoroughly wet because these soils typically have a claypan or clay layer at or near the surface with a high shrink-swell potential and a high water table (NRCS 2025b).

Redtough-Reswale series consist of cobbly and loamy alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock. Occurring in relatively flat landforms with slopes of 0 to 2 percent within swales of fan remnants these soils typically exhibit hydric components and are characterized as having a slow infiltration rate and high runoff potential when thoroughly wet because of a shallow restrictive layer with a high shrink-swell potential and a high water table (NRCS 2025b).

Xerofluvents are stratified sandy and gravelly alluvium derived from igneous, metamorphic, and sedimentary rock. These soils occur within channels in of relatively flat landforms of 0 to 4 percent slope, and are subject to frequent flooding. These soils are characterized as not having a moderate infiltration rate when thoroughly wet, and lack hydric components. These soils typically consist of moderately deep, well-drained materials with moderately fine texture to moderately coarse textures (NRCS 2025b).

4.2 Aquatic Resources

A total of 0.704 acre of aquatic resources have been mapped within the Study Area (Table 2). The wetland and Ordinary High Water Mark (OHWM) determination data forms are included in Appendix B, and a list of plant species observed within the Study Area is included as Appendix D. A discussion of the aquatic resources is presented below, and the ARD map is presented on Figure 4.

Table 2. Aquatic Resources

Type	Acreage[1]
Potential Other Waters	
Ephemeral Drainage	0.486
Intermittent Drainage	0.218
Total:	**0.704**

Notes: [1]Acreages represent an estimation and are subject to modification following the USACE verification process.

Map Contents

Study Area - 11.85 ac.

Stormwater and Wastewater Detention Basin - 1.671 ac.

Reference Coordinates

Culvert

Sample Points

Upland Sample Point

Transect Point

Aquatic Resources (0.704 ac.)

Other Waters (0.704 ac.)

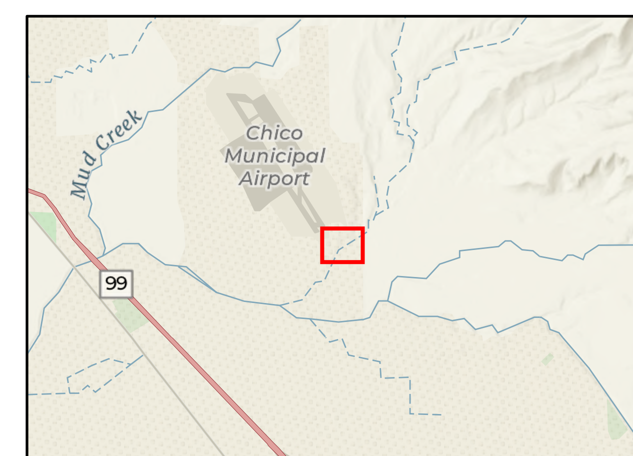
Ephemeral Drainage (0.486 ac.)

Intermittent Drainage (0.218 ac.)

Photo Source: Maxar (2024)
Boundary Source: Bennett Engineering Services
Delineator(s): Daniel Machek and Laurens Kuypers
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

* The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aquatic_Resources\CASRP Aquatic Resources.aprx - CASRP ARD 20250320 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 150

Figure 4. Aquatic Resources Delineation

2024-138.02A Chico Airport Pond Sewer Repair Project

Representative site photographs are included as Appendix E. The USACE Operations and Maintenance Business Information Link Regulatory Module aquatic resources table of potential Waters of the U.S./State is included in Appendix F.

4.2.1 Other Waters

4.2.1.1 Ephemeral Drainage

Ephemeral drainages are small-order drainages, exhibiting an OHWM, which have flowing water during and immediately following precipitation events in a typical year. Ephemeral drainages are not influenced by groundwater sources at any time during the years. Approximately 0.4886 acres (746 linear feet) of ephemeral drainage were mapped within the Study Area. The ephemeral drainages identified within the Study Area exhibit OHWMs that were delineated in the field based on a combination of indicators including changes in sediment texture, changes in vegetation composition and cover, and distinct transition breaks in bank slope. Additional morphological indicators of the OHWM including sediment deposition and sediment sorting were also observed.

Although separated by a gated culvert, ephemeral drainages ED-01 and ED-02 are directly hydrologically connected. Both ED-01 and ED-02 are sparsely vegetated below the OHWM and moderately vegetated directly above the OHWM. The upper banks of the levee road and bike path adjacent to ED-01 and ED-02 are devoid of vegetation, because of gravelly road aggregate and herbicidal treatment. ED-02 terminates in the south at a significant rise in elevation and a compositional change of upland vegetation that matches the adjacent upland grassland. ED-02 primarily receives sheet-flow from the west and may receive additional input from the south during heavy rains. Before draining north of the Study Area, ED-01 receives flow from ED-02, and stormwater from culverts underneath Cohasset Rd.

Ephemeral drainage ED-03 is characterized by a steep cut-bank on the eastern side, and a gravel bar below a moderate break in bank on the western side. An access road occurs along the eastern upper bank and is devoid of vegetation due to herbicidal treatment. The west bank of ED-03 is heavily vegetated with upland herbaceous species including yellow star-thistle and Italian thistle and is moderately vegetated within the OHWM with common gumplant (*Grindelia camporum,* [FACW]), curly dock (*Rumex crispus,* [FAC]), and various unidentifiable grasses along a scoured gravel-bar.

Ephemeral drainage ED-04 is completely devoid of vegetation within the OHWM. Sparse patches of annual grasses occur along the top of bank amid a mostly barren area of compacted access roads parallel to both banks of ED-04. Both sides of the drainage are likely to be heavily treated with herbicides. ED-04 exhibits significant scouring within a bed and bank composed of dense clay material; indicating seasonally flows. Ephemeral drainage ED-05 is separated from ED-04 by gated culverts. Although ED-05 exhibits a break in bank slope, a prevalence of cobble and gravel with the bed and a lack of significant scour indicates that discharges from ED-04 loses much energy when passing through the dividing culverts. ED-05 exhibits sparse to moderate patches of vegetation below the OHWM within a cobbled bed. Above the OHWM of ED-05 is heavily vegetated with low-growing annual grassland.

4.2.1.2 Intermittent Drainage

Intermittent drainages are linear features that exhibit a bed and bank, OHWM, and flow for weeks or months following significant precipitation events. Intermittent drainages differ from ephemeral drainages in that they flow for longer duration and are influenced by groundwater sources. This usually results in greater quantities and duration of flow relative to ephemeral drainages. Approximately 0.2184 acre (168 linear feet) of intermittent drainage was mapped within the Study Area. The intermittent drainage within the Study Area known as Sheep hollow Creek exhibits an OHWM (Figure 4), and was delineated in the field based on changes in average sediment texture, changes in vegetation composition and relative cover, distinct transition breaks in bank slope, and morphological indications of channel bed and bank.

Within the Study Area, Sheep Hollow Creek occurs as an intermittent drainage (ID-01) that flows from east to west through the center of the Study Area. The drainage is vegetated below the OHWM with a mix of low-growing annual grasses including Italian ryegrass (*Festuca perennis*) (FAC) and barley grass (*Hordeum sp.*) (FAC or FACU), and herbaceous species including red-stem filaree (*Erodium cicutarium*) and curly dock (*Rumex crispus*) (FAC). The lowest margins of the channel are dominated by creeping spikerush (*Eleocharis macrostachya*) (OBL). The vegetation above the OHWM of ID-01 is dominated with mostly upland grasses and forbs including wild oats (*Avena fatua*), hawbit (*Leontodon saxatilis*), and yellow star-thistle (*Centaurea solstitialis*).

ID-01 was observed to have an approximately 4 to 6-foot wide braided channel with a depth of 5 to 30 inches. The greater channel (approximately 30 feet wide) within the OHWM exhibits distinct cutbanks, sediment and debris deposition, and scour.

5.0 JURISDICTIONAL ASSESSMENT

Per Regulatory Guidance Letter 16-01, an applicant may request a PJD:

> … in order to move ahead expeditiously to obtain a Corps permit authorization where the requestor determines that it is in his or her best interest to do so … even where initial indications are that the aquatic resources on a parcel may not be jurisdictional (USACE 2016b).

The following assessment is provided for general planning purposes and would require USACE verification to support permit applications. It is reasonable to assume that ID-01 would be considered Waters of the U.S. because it is "relatively permanent" tributary with a continuous surface water connection to Sycamore Creek which flows to the Sacramento River, which is considered a traditional navigable water. The ephemeral drainages within the Study Area are not considered relatively permanent and therefore not likely to be considered jurisdictional Waters of the U.S. Regardless of CWA Section 404 jurisdictional status, all the intermittent and ephemeral aquatic features mapped onsite would likely be considered Waters of the State.

The stormwater and wastewater detention basin in the Study Area was created wholly in an upland area, drains only uplands. This feature was not a relocation of a naturally occurring stream or wetland does not have a continuous surface water connection to any aquatic resources. This feature was created and functions as a tertiary stormwater/wastewater detention basin, containing runoff from upslope land uses north of the Study Area. This tertiary stormwater/wastewater detention basin would likely not be considered as Waters of the U.S. nor a Waters of the State.

6.0 CONCLUSION

A total of approximately 0.704 acre of aquatic resources have been mapped within the Study Area. This acreage represents a calculated estimation of the extent of aquatic resources within the Study Area and is subject to modification following USACE review and/or the verification process. The placement of dredged or fill material into Waters of the U.S. would require a permit pursuant to Section 404 of the CWA and certification or waiver in compliance with Section 401 of the CWA. The placement of dredge or fill material into Waters of the State that are not Waters of the U.S. would require issuance of a Waste Discharge Requirement by the state or RWQCB.

7.0 REFERENCES

Baldwin, G. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California*, Second Edition. University of California Press, Berkeley. 1568 pp.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services. Washington, D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1 Online edition. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. https://www.sac.usace.army.mil/Portals/43/docs/regulatory/1987_wetland_delineation_manual_reg.pdf

Jepson Flora Project (eds.) 2022. *Jepson eFlora*. https://ucjeps.berkeley.edu/eflora/. Accessed March 20, 2025.

Munsell Color. 2009. *Munsell Soil Color Book*. Munsell Color. Grand Rapids, Michigan.

National Oceanic and Atmospheric Administration. 2025. *National Centers for Environmental Information. 1991-2020 Climate Normals for Orland, CA Station*. NOAA NCEI U.S. Climate Normals Quick Access.Accessed March 22, 2025.

Natural Resources Conservation Service (NRCS). 2025a. *Web Soil Survey*. http://websoilsurvey.nrcs.usda.gov/. Accessed March, 2025.

_____. 2025b. *Soil Data Access Hydric Soils List*. https://www.nrcs.usda.gov/publications/query-by-state.html. Accessed March, 2025.

_____. 2003. *National Soil Survey Handbook*. http://soils.usda.gov/technical/handbook.

Natural Resources Conservation Service (NRCS), U.S. Geological Survey, and U.S. Environmental Protection Agency. 2016. *Watershed Boundary Dataset for California*. http://datagateway.nrcs.usda.gov. Accessed March, 2025.

U.S. Army Corps of Engineers (USACE). 2022. *National Wetland Plant List*, Version 3.6. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory. Hanover, New Hampshire. https://nwpl.sec.usace.army.mil/. Accessed March, 2025.

_____. 2016a. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*. U.S. Army Corps of Engineers. p. 20. January.

_____. 2016b. *Regulatory Guidance letter 16-01, Jurisdictional Determinations*. October.

_____. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*.

_____. 2008b. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*.

_____. 1992. *Clarification and Interpretation of the 1987 Manual. Memorandum from Major General Arthur E. Williams*. March 6.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. 2007. *Memorandum Re: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. June 5.

U.S. Fish and Wildlife Service (USFWS). 2025. *National Wetlands Inventory*. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed March, 2025.

U.S. Geological Survey. 1970. *Richardson Springs, California 7.5-Minute Topographic Quadrangle*. In: Survey. G, editor. Denver, Colorado.

LIST OF APPENDICES

APPENDIX A

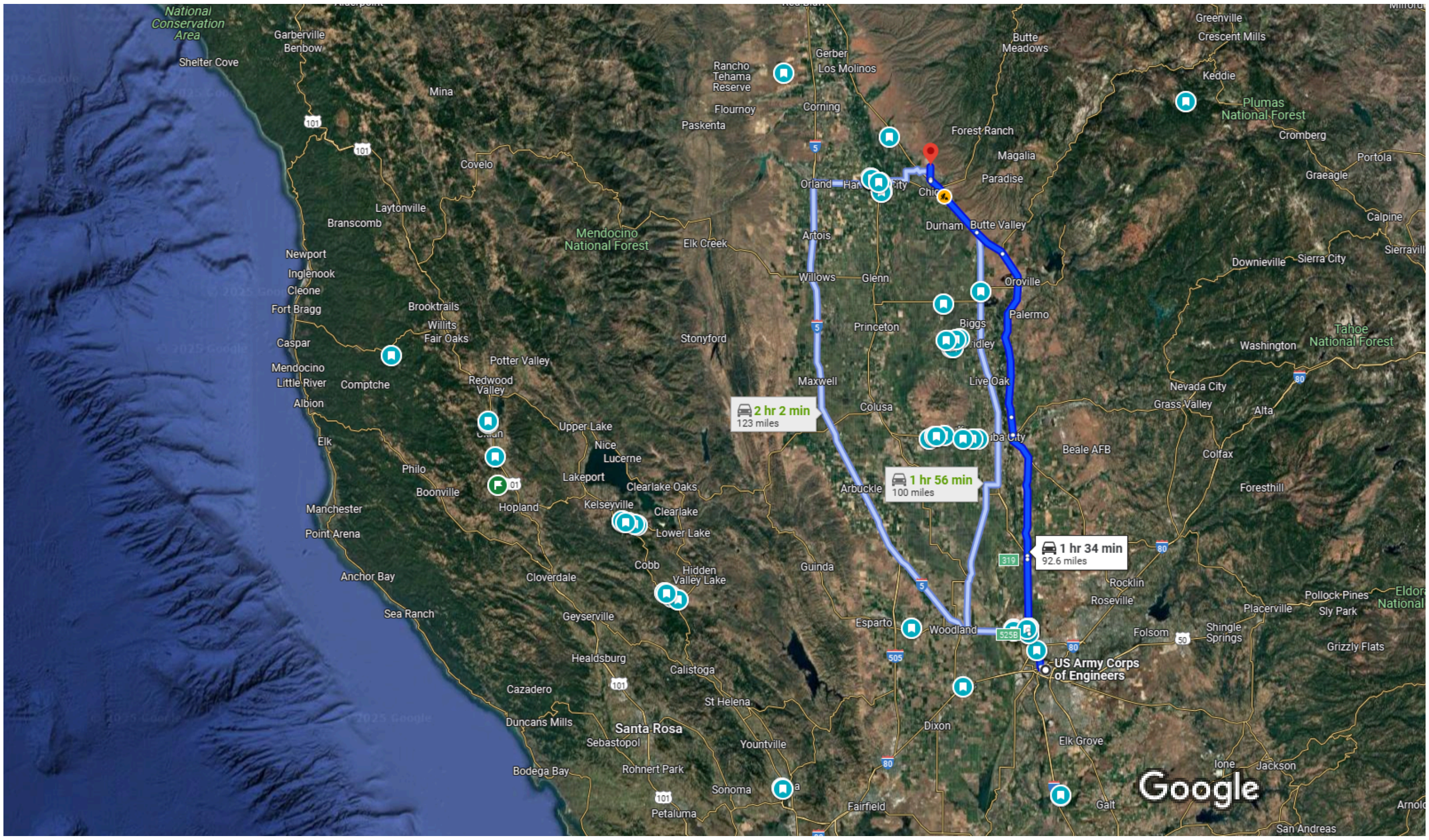
Driving Directions to Study Area

Google Maps

US Army Corps of Engineers, 1325 J St Room 1640, Sacramento, CA 95814 to Cohasset Rd, Chico, CA 95973

Drive 92.6 miles, 1 hr 34 min

Driving Directions From Sacramento to The Chico Airport Sewer Repair Project Aquatic Resources Delineation Study Area



Imagery ©2025 NASA, Map data ©2025 Google 10 mi

US Army Corps of Engineers
1325 J St Room 1640, Sacramento, CA 95814

Get on I-5 N from I St

4 min (1.1 mi)

1. Head east on J St toward 14th St

184 ft

2. Turn left onto 14th St

417 ft

3. Turn left onto I St

0.7 mi

4. Use the right 2 lanes to turn right onto the I-5 N/State Hwy 99 ramp to Redding/Yuba City

0.3 mi

Take CA-99 N, CA-70 N and CA-99 N to Cohasset Rd in Chico. Take exit 387A from CA-99 N

1 hr 25 min (89.4 mi)

5. Merge onto I-5 N

5.8 mi

6. Use the right 2 lanes to take exit 525B for CA-99 N toward Yuba City/Marysville

0.7 mi

7. Continue onto CA-99 N

11.8 mi

8. Use the right 2 lanes to turn slightly right onto the CA-70 ramp to Marysville/Oroville

0.6 mi

9. Continue onto CA-70 N

21.4 mi

10. Turn right onto State Hwy 70 E/9th St (signs for Oroville)

Pass by AutoZone Auto Parts (on the right)

0.2 mi

11. Turn left onto CA-70 S/B St

Pass by Dollar General (on the right)

3.0 mi

12. Continue onto CA-70 N

28.6 mi

13. Keep left to continue on CA-149 N

5.7 mi

14. Merge onto CA-99 N

11.4 mi

15. Take exit 387A for Cohasset Rd toward Mangrove Ave

0.2 mi

16. Use the right lane to take the ramp onto Cohasset Rd

0.2 mi

17. Merge onto Cohasset Rd

Pass by Wells Fargo Bank (on the right in 0.3 mi)

Destination will be on the left

4 min (2.0 mi)

Cohasset Rd

Chico, CA 95973

APPENDIX B

Wetland and Ordinary High Water Mark Datasheets - Arid West

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Chico Airport Sewer Repair **Project Number:** 2024-138.02A **Stream:** ED01, ED02 **Investigator(s):** Dan Machek, Laurens Kuypers	**Date:** 03/18/2025 **Time:** 0910 **Town:** Chico **State:** CA **Photo begin file#:** **Photo end file#:**
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** South of Chico airport, west of Cohasset Rd, south east of airport runway, north of E Eaton rd **Projection:** **Datum:** NAD 83 **Coordinates:** 39.785379, -121.844281

Potential anthropogenic influences on the channel system:
Constructed drainage feature that receives storm water runoff from adjacent road and field. Additionally, this feature receives flow from east of Cohasset Rd via culverts that route below the road. The feature delivers stormwater and local flooding discharge from from surrounding area to Sheep Hollow Creek.

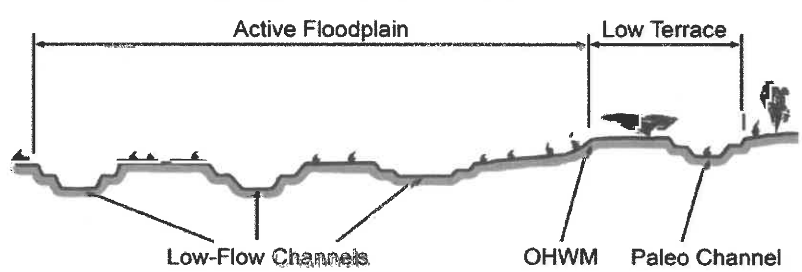
Brief site description: The feature is bound by an elevated road base to the east and a maintained levee structure to the west. The feature extends southward and terminates where it gains in elevation, also the feature is bisected by an access road that is outfitted with a gated culvert, allowing drainage from the southern extent to across the levee to the north portion of the feature. The southern portion of the feature is not strictly bounded by the afore mentioned levee and receives flow from the adjacent field.

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

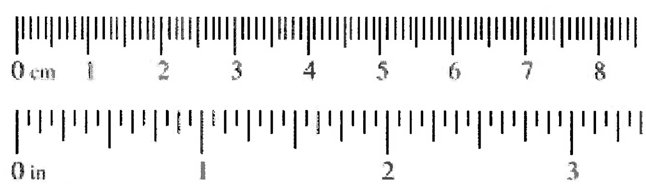


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☒ Digitized on computer
   - ☐ Other:

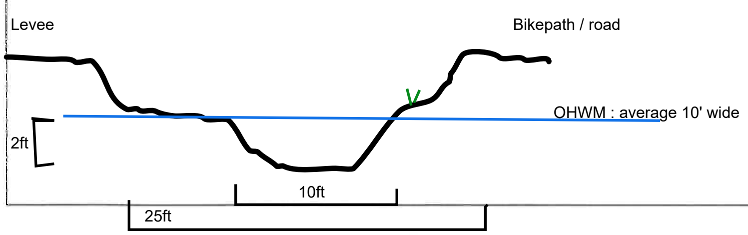
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: 2024-138.02A **Cross section ID:** Transect 1 **Date:** 03/18/2025 **Time:** 09:10

Cross section drawing:



Veg Above OHWM
- Torilis sp.
- Festuca perennis
- Centaurea solstitialis

Veg Below OHWM
- Eleocharis Sp.
- Cynodon dactylon
- Centaurea solstitialis

Upper levee bank appears to be partially teated with herbicide

OHWM

GPS point: 39.785379, -121.844281

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Distinct band of depositional fines
- [ ] Other: ____

Comments:

Transect 1 - OHWM derived from a indications of a sediment change and distinct sediment deposition. Although opportunistic upland vegetation occurs sparsely within the bed of the feature, there is a significant change in vegetative cover below and above the perceived OHWM.

This drainage is subject to flashy influxes: above the OHWM, at the levee edge, are indications of debris deposition from seasonal flooding and heavy discharge events.

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: ____

Characteristics of the floodplain unit:

Average sediment texture: Gravel, rock, sandy depositions of fines

Total veg cover: 10 % Tree: 0 % Shrub: 0 % Herb: 10 %

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:

the low flow channel was very sparsely vegetated. bed is characterized by cobbles with sandy depositions.

Project ID: **Cross section ID:** **Date:** **Time:**

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

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

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:

Feature is channelized between constructed levee banks as it occurs within the Study Area. Low terrace occur north of the study area along the floodplain of sheep hollow creek, and south beside ED-02 as the open field west of the Study Area.

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

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: Rocky gravel

Total veg cover: 20 % Tree: _____ % Shrub: _____ % Herb: 20 %

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:

"active floodplain composed of to upper banksides of channel where a band of vegetation, and debris drft occur along levee bank.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Chico Airport Sewer Repair **Project Number:** 2024-138.02A **Stream:** ID-01 **Investigator(s):** Dan Machek, Laurens Kuypers	**Date:** 03/18/2025 **Time:** 1020 **Town:** Chico **State:** CA **Photo begin file#:** **Photo end file#:**
Y [X] / N [ ] Do normal circumstances exist on the site? Y [ ] / N [X] Is the site significantly disturbed?	**Location Details:** South of Chico airport, west of Cohasset Rd, south east of airport runway, north of E Eaton rd **Projection:** **Datum:** NAD 83 **Coordinates:** 39.786141, -121.847005

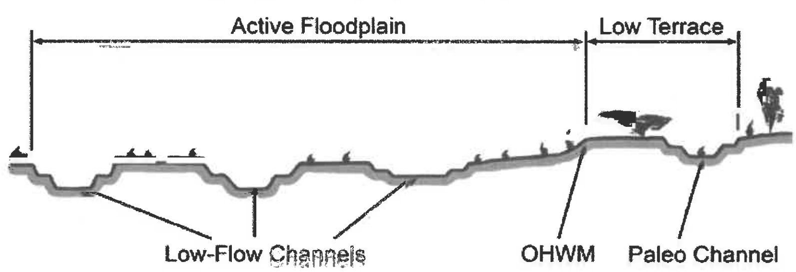
Potential anthropogenic influences on the channel system: Sheeps Hollow Creek, an intermittent stream, receives seasonal flows which are increased during local rains by storm water runnoff directed from ditches built to discharge to the creek. The greater floodplain limits of the stream are bounded by two built levees: a levee in the south along a flood-controlled field, another levee north, separating the stream from a composting facility and airport land.

Brief site description:
Sheeps Hollow Creek, where it occurs within the site is bound by levee systems. Within the OHWM, the stream has cut a thalweg of a cobbled/gravel bed in a braided flow path. The stream exhibits indications of seasonal high flows, cutting 3-4ft tall cutbanks and delivery of vegetation and trash debris. A few locust trees occur within and above the OHWM, and some valley oaks occur above the OHWM.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [X] 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

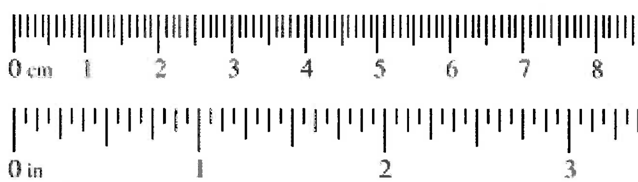


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - [X] GPS
   - [X] Digitized on computer
   - [ ] Other:

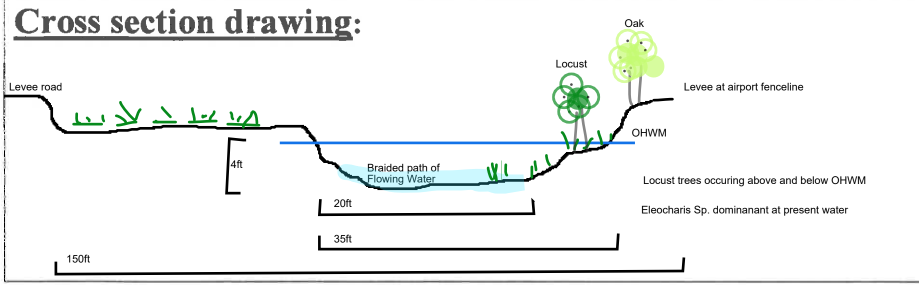
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: 2024-138.02A **Cross section ID:** Transect 2 **Date:** 03/18/2025 **Time:** 10:20

Cross section drawing:



OHWM

GPS point: 39.786280, -121.845567

Indicators:

- [ ] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Debris drifts
- [x] Other: Bend vegetation from intermittent high flows

Comments:
The Intermittent drainage, Sheep Hollow Creek, observed to be flowing with a braided pattern within the channel from recent rains. The southern bank is characterized by distinct sloughing cut banks. The north bank is characterized by a 10-15 ft "shelf" within the OHWM that is co-dominated by FAC and FACW species. The flowing channel exhibit s a grave/cobble bed with sections of minor plunge and scour. The upland vegetation profile exhibits a dominance of upland thistles and grasses with a distinct absence of Eleocharis sp., that occurs within the well defined channel.

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________________

Total veg cover: 20 % Tree: ____ % Shrub: ____ % Herb: 20 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [x] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [x] Other: Flowing surface water
- [ ] Other: ____________________
- [x] Other: Scour

Comments:
Low flow channel characterized by a braided channel with scour, plungepools, pools along cut banks, and obligate vegetation growth.

Project ID: **Cross section ID:** **Date:** **Time:**

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

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: 100 % Tree: 5 % Shrub: 0 % Herb: 95 %

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:

Partially within the OHWM of the drainage, the flood plain is moderately slope on the north bank and exhibits drift debris, floodplain scour and change in bank. the woody species occurring consist of a sparse count of black locust trees.

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

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

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:

Low terrace occurs past the south bank of the drainage, above the steep cutbanks. the low terrace is bound by a levee in the south. the low terrace may be flooded in exceedingly high flows, but otherwise drains to sheep hollow creek and is dominated with upland annual grassland. There are some low points of seasonal scour and some drift deposition that indicates periodic flooding of the low terrace.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Chico Airport Sewer Repair
Project Number: 2024-138.02A
Stream: ED-03
Investigator(s): Dan Machek, Laurens Kuypers

Date: 03/18/2025 **Time:** 1040
Town: Chico **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [X] / N [ ] Is the site significantly disturbed?

Location Details: South of Chico airport, west of Cohasset Rd, south east of airport runway, north of E Eaton rd

Projection: **Datum:** NAD 83
Coordinates: 39.786141, -121.847005

Potential anthropogenic influences on the channel system:
This feature serves as a stormwater conveyance drainage that delivers flow from north of the site to Sheep Hollow Creek via a gated culvert system.

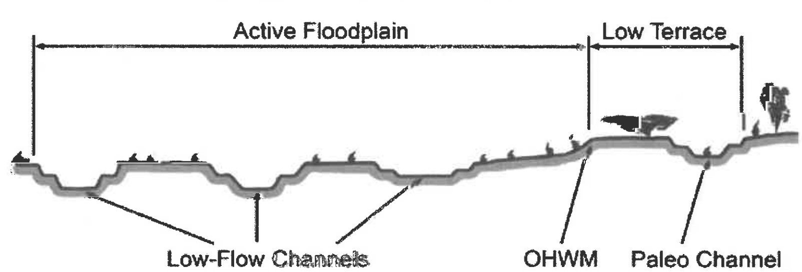
Brief site description: The low flow channel is narrow and incised into an eroded bank. The feature, as it occurs within the site, is characterized by a steep eastern cutbank, and exhibits indicators of seasonally flashy high flows. The Feature outflows through a culvert system to Sheep Hollow Creek, and there are indications that during high flows, the triple-cuvert is over-topped.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [X] 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



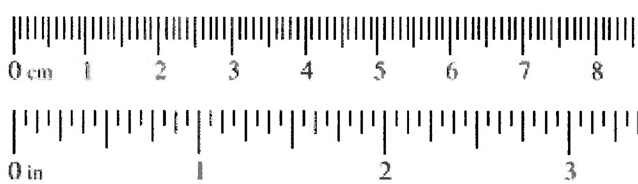
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
- [X] GPS
- [X] Digitized on computer
- [ ] Other:

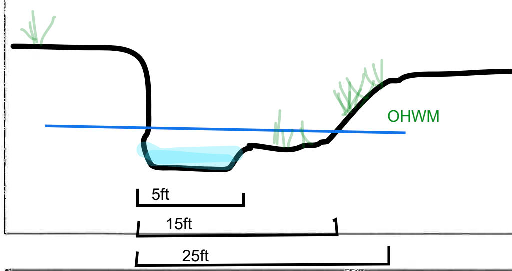
Wentworth Size Classes

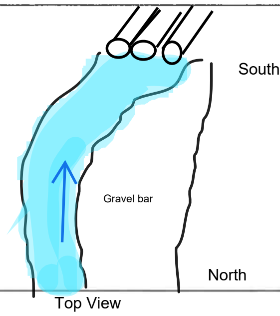
Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: 2024-138.02A **Cross section ID:** Transect 3 **Date:** 03/18/2025 **Time:** 1040

Cross section drawing:





OHWM

GPS point: 39.786640, -121.845140

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Debris drift deposits
- [x] Other: Bent Vegetation

Comments:

The low-flow channel is characterized by gravel substrate and a thalweg beside a steep cutbank. The west section of channel within the OHWM is a sand bar/bench of gravel, sand, and fines. Vegetation is absent from the low flow channel and the steep cutbank (the top of which appears treated by herbicide). The snad bar exhibits annual FAC herbaceous and grass species which occer in the immediate upland as well. The upland species composition is contrasted by the occurrence of Hirschfeldia incana and grindelia sp.

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: ______

Characteristics of the floodplain unit:

Average sediment texture: ______

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [ ] Surface relief
- [x] Other: Surface flow in thalweg
- [ ] Other: ______
- [ ] Other: ______

Comments:

The low flow channel consist of a cobbly bed, devoid of fines that is scoured into the toe of a vertical cubank that had been eroded from seasonal flows. The low flow beds around a gravel bar opposite of the cutbank to drain through a triple culvert.

Project ID: **Cross section ID:** **Date:** **Time:**

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

GPS point: ____________

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: 25 % Tree: ____ % Shrub: ____ % Herb: 25 %

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: Sediment deposition and compositional scour
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

The active floodplain includes the whole width of the OHWM and at full bank flood levels, sediment and debris deposition inticates regular flooding that over tops the hight of the triple culverts, draining over the concrete access road to ID-01. The gravel bar and bank transition are formed within the floodplain.

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

GPS point: ____________

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: 50 % Tree: 20 % Shrub: ____ % Herb: 30 %

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:

The low terrace of this feature occurs in a slightly concave area west of the edge of bank. The terrace may recieve overbank flow in extremly high flows, however, drift and sediment deposition indicates that the terrace occasionally recieves sheet flow from the access road when ED-03 experiences a full floodplain and overtops the culvert. This area has one large oak tree and a continuation of herbaceous undergrowth as grows along the bank.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Chico Airport Sewer Repair
Project Number: 2024-138.02A
Stream: Ed-04, ED-05
Investigator(s): Dan Machek, Laurens Kuypers

Date: 03/18/2025 **Time:** 1300
Town: Chico **State:** CA
Photo begin file#: **Photo end file#:**

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: South of Chico airport, west of Cohasset Rd, south east of airport runway, north of E Eaton rd

Projection: **Datum:** NAD 83
Coordinates: 39.786141, -121.847005

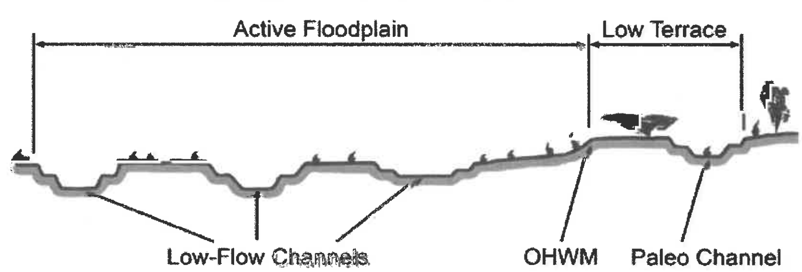
Potential anthropogenic influences on the channel system:
The system has been artificially channelized, is bisected by culvert systems, and it flow is influenced by redirected storm water flow and overland runoff.

Brief site description: The drainage system occurs within a channel set between two gravel access roads. The banksides are partially armored with unconsolidated concrete and construction debris. The drainage, as it occurs in the study area, is fed by flow from a road-crossing culvert and outflows through a gated culvert system toward Sheep Hollow Creek. Additionally, an underground conveyance system, potentially a stormwater system, distributes flow into the center of the drainage feature.

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

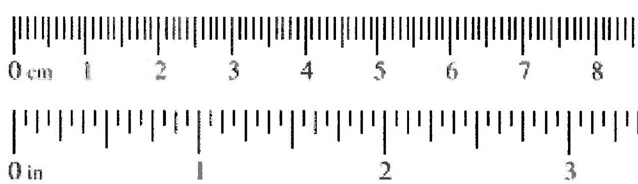


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☒ Digitized on computer
   - ☐ Other:

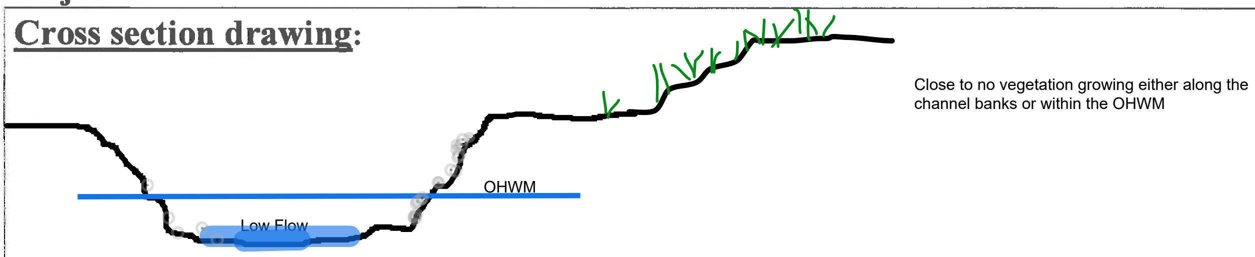
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: 2024-138.02A **Cross section ID:** **Date:** 03/18/2024 **Time:** 13:00

Cross section drawing:



OHWM

GPS point: 39.785870, -121.848271

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: Scour & Shelving
- [ ] Other: ______

Comments:

The channel is nearly void of vegetation . The low-flow observed within the thalweg exhibits algae growth. Sections of the banks are significantly scoured, indicating periodic flashy flows. The substrate is washed out of most fines, exhibits no deposits of organic soils and is interspersed with various rocks, cobbles and chunks of construction debris. The upland directly adjacent to the channel

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: ______

Characteristics of the floodplain unit:

Average sediment texture: ______

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [ ] Surface relief
- [x] Other: Active surface flow and scour
- [ ] Other: ______
- [ ] Other: ______

Comments:

The low flow channel runs a shallow braided path though the bed of the channel consisting of impermeable clay and cobbles.

Project ID: **Cross section ID:** **Date:** **Time:**

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

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: 0____ % Tree: 0____% Shrub: 0____% Herb: 0____%

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: Scour and cut banks
- ☐ Other: ______________
- ☐ Other: ______________

Comments:

Hardly a description of flood "plain", although with high flows, the approximately 30 ft channel shows scour and deposition indications of high velocity flows that fill the much of the channel. The channel shows no indication of ever ovetopping the banks to the adjacent roads and field.

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

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

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:

The closest description to a Low terrace for this feature would be the adjacent roads and airstrip of the Chico Airport.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Chico Airport Pond Sewer Repair City/County: Chico/Butte Sampling Date: 3/18/2025

Applicant/Owner: City of Chico State: CA Sampling Point: 1

Investigator(s): Dan Machek, Laurens Kuypers Section, Township, Range: S 03, T 22N, R 01E

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

Subregion (LRR): LRR C Lat: 39.785886 Long: -121.844869 Datum: NAD 83

Soil Map Unit Name: 300- Redsluff gravelly loam NWI classification: N/A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil X, 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 x
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No x

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Depressional feature with pooling water at toe of levee slope. Presumed to host pooling rainwater from recent storms. Swale as part of a larger flood mitigation overflow ditch along levee. No vegetation present throughout larger feature; likely subject to herbicidal treatment.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
=Total Cover			
Sapling/Shrub Stratum (Plot size: 20x20)			
1.			
2.			
3.			
4.			
5.			
=Total Cover			
Herb Stratum (Plot size: 5'x5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
=Total Cover			
Woody Vine Stratum (Plot size: 20x20)			
1.			
2.			
=Total Cover			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ___

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:
Sample area adjacent to pooling water; absolutley bare of vegetation. No vegetation present along entire toe of levee slope; likely subject to regular herbicidal treatment.

SOIL

Sampling Point: 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 Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:
Uniform matrix, no concentrations, no refusal or duripan.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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 on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:
No watertable and no saturation at lower soil stratum. Surface water present: rainwater from recent storms. Although, Surface water was oberserved within the feature during the site visit, the temporary ponding is not a result of sustaianed wetland hydrology and does not meet the definition of indicators A1, A2, or A3.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Arid West Region** See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Chico Airport Pond Sewer Repair City/County: Chico/Butte Sampling Date: 3/18/2025

Applicant/Owner: City of Chico State: CA Sampling Point: 2

Investigator(s): Dan Machek, Laurens Kuypers Section, Township, Range: S 03, T 22N, R 01E

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

Subregion (LRR): LRR C Lat: 39.786903 Long: -121.847529 Datum: NAD 83

Soil Map Unit Name: 302- Redtough-Redswale NWI classification: N/A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil X, 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 X	No	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes X	No	

Remarks:
Dark upper soil layer is likely from runoff from compost facility. Immediate adjacent area also has asphalt underlying soil. These two factors make the soil naturally problematic. Consider an upland swale.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30x30)			
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 20x20)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Festuca perennis*	90	Yes	FAC
2. *Hordeum marinum*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: 20x20)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		285 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X 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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 2

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	Remarks
0-6	5YR 2.5/1	100					Loamy/Clayey	
6-9	5YR 3/4	92	2.5YR 2.5/1	5	C	M	Loamy/Clayey	Faint redox concentrations
			5YR 4/2	3	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:
Cobble refusal at 9 inches. Area immediately adjacent to swale was used for compost processing/storage. Likely that swale was sedimented with compost material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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 on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

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

Remarks:
Saturation presence due to recent rains. Asphalt likely perches the water and contributes to inundation being visible on aerial imagery.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Chico Airport Pond Sewer Repair City/County: Chico/Butte Sampling Date: 3/18/2025
Applicant/Owner: City of Chico State: CA Sampling Point: 3
Investigator(s): Dan Machek, Laurens Kuypers Section, Township, Range: S 03, T 22N, R 01E
Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): LRR C Lat: 39.786882 Long: -121.847517 Datum: NAD 83
Soil Map Unit Name: 302 - Redtough Redswale NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are “Normal Circumstances” present? Yes X No ___
Are Vegetation ___, Soil X, 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?		X
Hydric Soil Present?		X
Wetland Hydrology Present?		x

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Upland point for upland swale test pit . Sample taken along aparent upland edge of swale in vegetated area between the swale and adjacent unpaved access road.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 20x20)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. *Bromus diandrus*	90	Yes	UPL
2. *Centaurea solstitialis*	5	No	UPL
3. *Torilis sp*	2	No	
4.			
5.			
6.			
7.			
8.			
	97	=Total Cover	
Woody Vine Stratum (Plot size: 20x20)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 3 % Cover of Biotic Crust 0

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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	95	x 5 =	475
Column Totals:	95 (A)		475 (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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:
Dense growth of upland grasses along berm beside feature and access road.

SOIL

Sampling Point: 3

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	5YR 2.5/1	100					Loamy/Clayey	
6-12	5YR 3/4	85	2.5YR 2.5/1	5	C	M	Loamy/Clayey	Faint redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: Cobble
Depth (inches): 12

Hydric Soil Present? Yes ___ No X

Remarks:
Cobble Refusal at 12 in. In depth 6-12, secondary matrix of 10 YR 2/1, 10%. Apparently some mixing of the top soils (which may be influenced from upslope composting facility) along with trash in lower stratum. Above noted redox concentrations at %5 in primary matrix, and at 2% (same redox color) in this darker secondary matrix at 6-12in.Colors indicating faint redox concentrations may be influenced by intrusions of organic material/ sediment from nearby compost operations.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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 on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): 0

Wetland Hydrology Present? Yes ___ No X

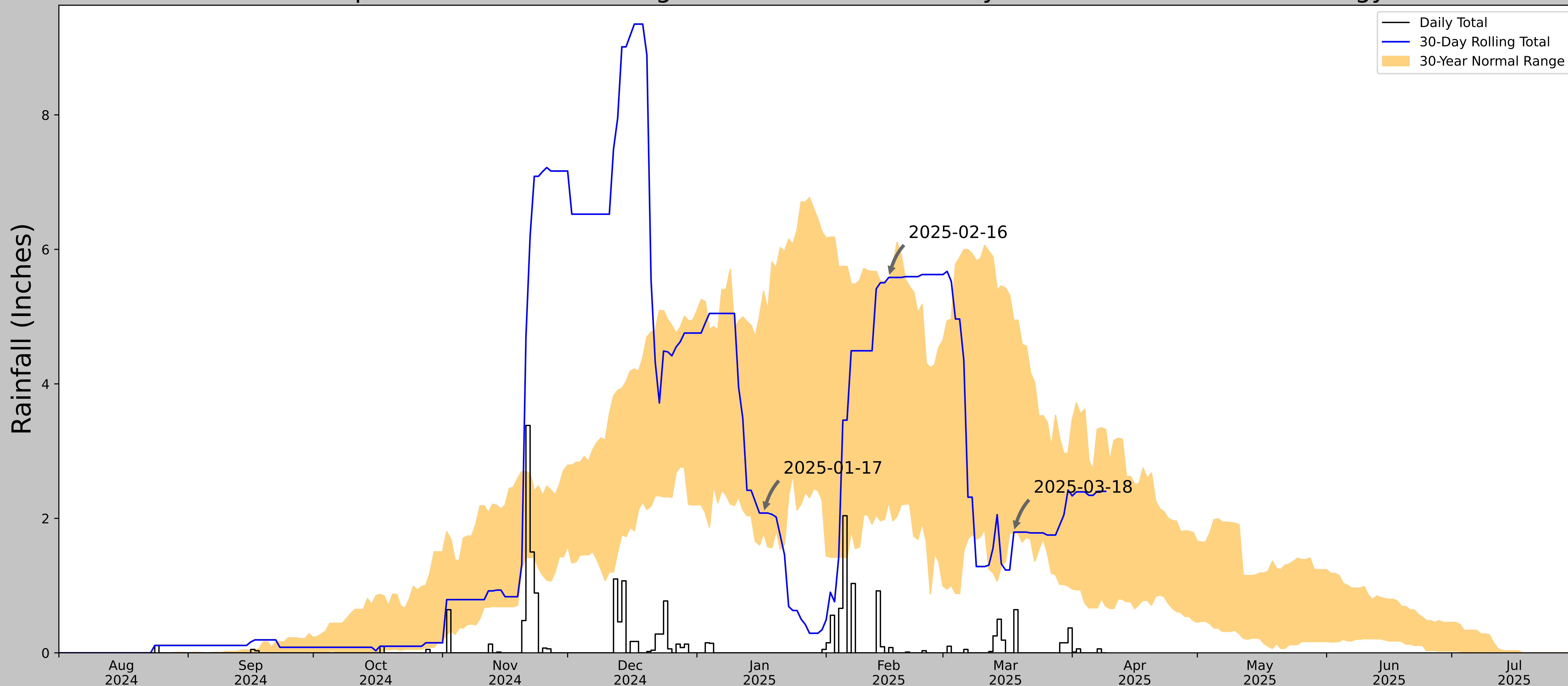
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Upland point showed no hydrological indications.

APPENDIX C

Antecedent Precipitation Tool

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.786141, -121.847005
Observation Date	2025-03-18
Elevation (ft)	192.741
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-03-18	1.780709	4.945669	1.795276	Normal	2	3	6
2025-02-16	2.248425	5.522047	5.582677	Wet	3	2	6
2025-01-17	1.784252	5.373622	2.07874	Normal	2	1	2
Result							Normal Conditions - 14

US Army Corps of Engineers

ERDC

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.1

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
ORLAND	39.7458, -122.1997	253.937	18.938	61.196	9.681	10627	90
GERBER-LAS FLORES 3.5 SW	40.0221, -122.1901	271.982	19.097	18.045	8.938	2	0
CHICO 1.2 NNW	39.7697, -121.8138	250.984	20.564	2.953	9.315	189	0
CHICO UNIV FARM	39.6911, -121.8211	185.039	20.473	68.898	10.623	457	0
CHICO 2.8 ESE	39.7339, -121.7604	375.0	23.354	121.063	13.337	26	0
OROVILLE MUNI AP	39.4942, -121.6222	187.008	35.311	66.929	18.253	52	0

APPENDIX D

Plant Species Observed Onsite

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
APIACEAE	**CARROT FAMILY**	**–**
*Torilis nodosa**	Wild parsley	N/L
ASTERACEAE	**SUNFLOWER FAMILY**	**–**
*Carduus pycnocephalus**	Italian thistle	N/L
*Centaurea solstitialis**	Yellow star-thistle	N/L
Grindelia camporum	Common gumplant	FACW
Layia platyglossa	Common tidy-tips	N/L
*Leontodon saxatilis**	Hairy hawkbit	FACU
BORAGINACEAE	**BORAGE FAMILY**	**–**
Amsinckia intermedia	Common fiddleneck	N/L
CONVOLVULACEAE	**MORNING-GLORY FAMILY**	**–**
*Convolvulus arvensis**	Field bindweed	N/L
CYPERACEAE	**SEDGE FAMILY**	**–**
Eleocharis macrostachya	Creeping spikerush	OBL
FABACEAE	**LEGUME FAMILY**	**–**
Lupinus bicolor	Bicolored lupine	N/L
*Medicago polymorpha**	Bur clover	FACU
*Robinia pseudoacacia**	Black locust (cultivated)	FACU
*Vicia villosa**	Hairy vetch	N/L
FAGACEAE	**OAK FAMILY**	**–**
Quercus lobata	Valley oak	FACU
GERANIACEAE	**GERANIUM FAMILY**	**–**
*Erodium cicutarium**	Red-stemmed filaree	N/L
OROBANCHACEAE	**BROOMRAPE FAMILY**	**–**
Triphysaria eriantha ssp. *eriantha*	Butter 'n' eggs	N/L
POACEAE	**GRASS FAMILY**	**–**
*Avena fatua**	Wild oat	N/L
*Bromus diandrus**	Ripgut brome	N/L
*Bromus madritensis**	Foxtail brome	UPL
*Festuca perennis**	Italian ryegrass	FAC
Hordeum murinum ssp. *glaucum**	Foxtail barley	FACU

SCIENTIFIC NAME	**COMMON NAME**	**INDICATOR STATUS**
POLYGONACEAE	**BUCKWHEAT FAMILY**	**–**
*Rumex crispus**	Curly dock	FAC
ROSACEAE	**ROSE FAMILY**	**–**
*Rubus armeniacus**	Himalayan blackberry	FAC

Notes: * = non-native species

Status Indicators:

FAC Facultative
FACU Facultative Upland
FACW Facultative Wetland
N/L Plants That are Not Listed
OBL Obligate

APPENDIX E

Representative Site Photographs

Photo 1. ID-01: View southwest of stream cutbank and high-flow drift deposits.

Photo 2. ID-01: View northeast of feature from within OHWM.

Photo 3. ID-01 View of controlled culverts connecting input flow from ED-03.

Photo 4. View from east edge of a stormwater/wastewater detention basin.

Photo 5. View from west edge of a stormwater/ wastewater detention basin.

Photo 6. View of upland ditch with inlet culvert to the stormwater/wastewater detention basin.

Photo 7: erosional scour from inlet to the stormwater/ wastewater detention basin. Note the dark compost discharge from upslope facility.

Photo 8. ED-01, looking south.

Photo 9. ED-02, looking south.

Photo 10. Rainwater pooled within a nonwetland ditch.

Photo 11. ED-04: View north toward Chico Airport.

Photo 12. ED-05: View south toward the outflow connection to ID-01.

APPENDIX F

U.S. Army Corps of Engineers
Operations and Maintenance Business Information Link Regulatory Module
Aquatic Resources Table

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
ED-01	CALIFORNIA	R6		Area	0.00759341	ACRE	DELIN.CONC	39.78536180	-121.84424570	
ED-02	CALIFORNIA	R6		Area	0.00257637	ACRE	DELIN.CONC	39.78520255	-121.84424341	
ID-01	CALIFORNIA	R4		Area	0.21840232	ACRE	DELIN.CONC	39.78625492	-121.84534972	Sheep's hollow Creek
ED-03	CALIFORNIA	R6		Area	0.03199737	ACRE	DELIN.CONC	39.78657403	-121.84512162	
ED-04	CALIFORNIA	R6		Area	0.41999292	ACRE	DELIN.CONC	39.78604062	-121.84848065	
ED-05	CALIFORNIA	R6		Area	0.02373335	ACRE	DELIN.CONC	39.78534074	-121.84786685	

APPENDIX D

Cultural Resources Inventory and Built Environment Resources Evaluation Report for the Chico Airport Pond Sewer Repair Project, ECORP Consulting Inc., October 2025

REDACTED

Cultural Resources Inventory and Built Environment Resources Evaluation Report for the Chico Airport Pond Sewer Repair Project

Butte County, California

Prepared For:

City of Chico
411 Main Street
Chico, CA 95928

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
55 Hanover Lane, Suite A
Chico, CA 95973

October 2025

Due to the sensitive nature of cultural resources, which is restricted from public distribution by state and federal law, this cultural resources report has been redacted to exclude confidential information. Individuals meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology may request copies of the confidential documentation from the California Office of Historic Preservation's California Historical Resources Information System.

MANAGEMENT SUMMARY

ECORP Consulting, Inc. was retained in 2024 to conduct a cultural resources inventory and built environment resources evaluation for the Chico Airport Pond Sewer Repair Project in Butte County, California. The City of Chico proposes the replacement and installation of sanitary sewer and storm drain infrastructure located to the south of the Chico Regional Airport (formerly known as Chico Municipal Airport), southeast of the City's existing composting facility, and north of the City's sphere of influence.

The inventory included a records search, literature review, and field survey. As a result of the study, ECORP identified and recorded two built environment resources within the APE: CA-01 (Chico-Mud Creek-Unit 3 East Sycamore Right Toe (RT) Levee System) and CA-02 (Chico Army Airfield Wastewater Treatment Plant). ECORP evaluated resources CA-01 and CA-02 using the National Register of Historic Places and California Register of Historical Resources eligibility criteria and concluded that neither resource is eligible under any criteria; therefore, resources CA-01 and CA-02 are not considered Historic Properties as defined by Section 106 of the National Historic Preservation Act or Historical Resources as defined by the California Environmental Quality Act. The proposed Project will have No Adverse Effects/No Significant Impact on these resources. Until the lead agencies concur with the identification and evaluation of eligibility of cultural resources, no Project activity should occur. ECORP also provides recommendations for the management of unanticipated discoveries.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
AAWTP	Army Airfield Wastewater Treatment Plant
AB	AB
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
APNs	APNs
BERD	Built Environment Resource Directory
BLM	Bureau of Land Management
BP	Years before present
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHL	California Historical Landmarks
CHRIS	California Historical Resources Information System
City	City of Chico
CRHR	California Register of Historical Resources
CWA	Clean Water Act
DPR	California Department of Parks and Recreation
ECORP	ECORP Consulting, Inc.

Term	Definition
GLO	General Land Office
GSA	General Services Administration
JRP	JRP Historical Consulting, LLC
MDBM	Mount Diablo Base and Meridian
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NEIC	Northeast Information Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHP	California Office of Historic Preservation
PRC	Public Resources Code
Project	Chico Airport Pond Sewer Project
RPA	Registered Professional Archaeologist
SHPO	State Historic Preservation Officer
SRFCP	Sacramento River Flood Control Project
TCRs	Tribal cultural resources
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

1.0 INTRODUCTION

ECORP Consulting, Inc. was retained in 2024 to conduct a cultural and built environment resources inventory and evaluation for the Chico Airport Pond Sewer Repair Project in Butte County, California, north of the City of Chico's sphere of influence. A survey of the Project's Area of Potential Effects (APE) was required to identify potentially eligible cultural resources (i.e., archaeological sites and historic buildings, structures, and objects) that could be affected by the Proposed Project.

1.1 Project Location and Description

The proposed Project consists of replacement and installation stormwater diversion infrastructure and accessory-flow-monitoring equipment to improve system efficiency and eliminate or reduce the ongoing maintenance issues associated with the current facilities. The proposed Project includes the replacement and installation of a new storm drain diversion line, replacement of sanitary sewer pipe maintenance infrastructure (flow sensor), and construction of a new manhole and access road.

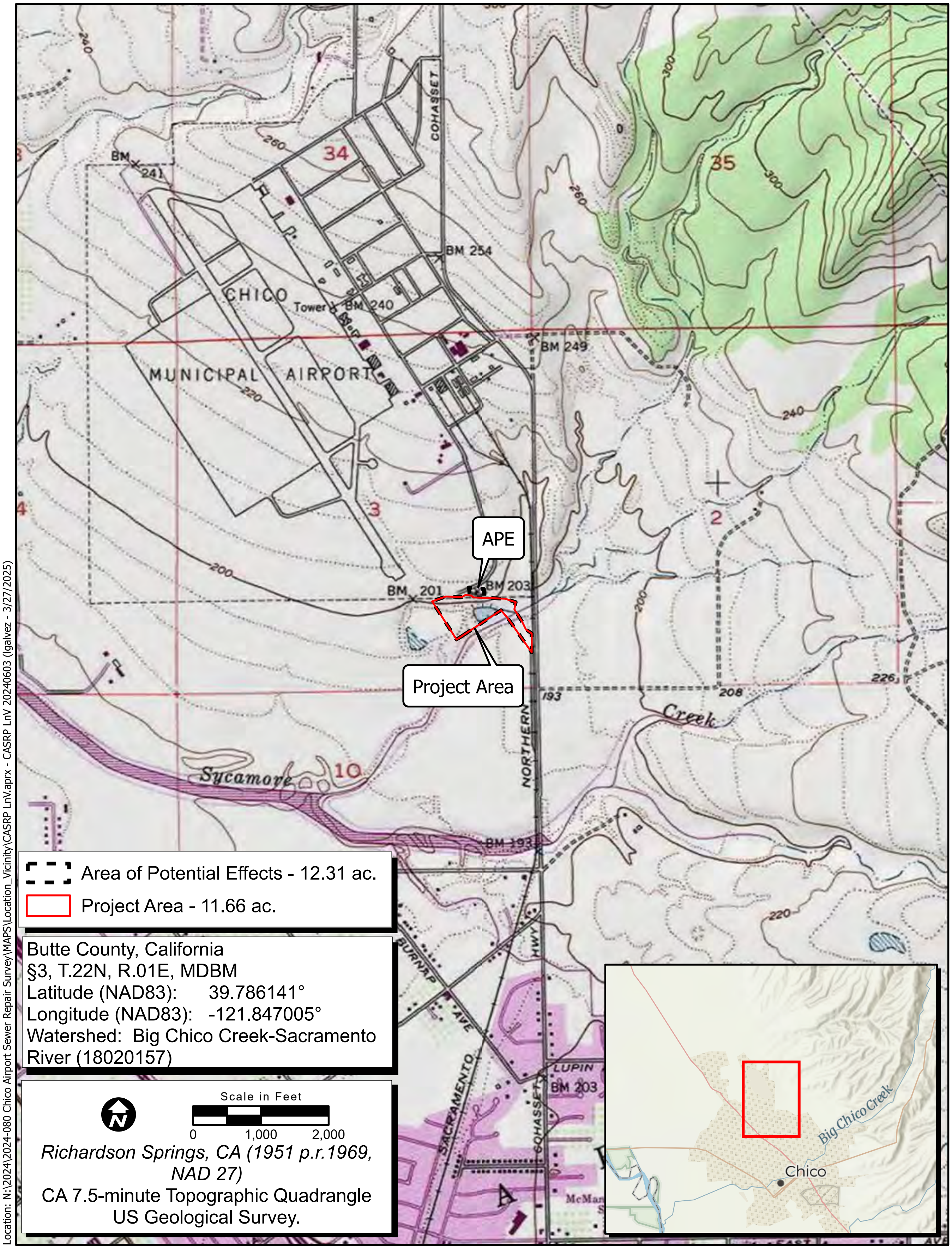
The Project Area encompasses the footprint of the proposed stormwater and sanitary sewer infrastructure and includes a portion of the former Chico Army Airfield Wastewater Treatment Plant (AAWTP). The former Chico AAWTP includes six features that meet the 50-year-age threshold to be considered a cultural resource; therefore, the Project's APE encompasses the Project Area (i.e., stormwater and sanitary sewer infrastructure footprint) and the entire former Chico AAWTP.

The APE is located within Section 3 of Township 22 North, Range 1 East, Mount Diablo Base and Meridian, as depicted by the 1969 photorevised edition of the 1951 U.S. Geological Survey (USGS) Richardson Springs, California 7.5-minute topographic quadrangle (Figure 1). The APE is bordered by the Chico Municipal Airport and the City of Chico's active composting facility to the north, Cohasset Road to the east, property associated with the Chico Regional Airport to the west, and grassland to the south. The APE is situated on two parcels: Assessor's Parcel Numbers (APNs) 047-550-001 and 047-550-006. The APE consists of 12.53 acres of land and the Project Area encompasses 11.85 acres.

1.2 Area of Potential Effects

The proposed Project Area comprises a portion of the AAWTP, which includes features that meet the 50-year age threshold to be considered a cultural resource; therefore, the Projects APE encompasses both the Project Area (the storm water infrastructure improvements) as well as the Chico AAWTP.

The APE consists of the horizontal and vertical limits of a project and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the project. The APE is defined for projects subject to regulations implementing Section 106 (federal law and regulations). For projects subject to the California Environmental Quality Act (CEQA) review, the term Project Area is used rather than APE. The horizontal Project Area consists of all areas where activities associated with a project are proposed and, in the case of this APE, includes areas proposed for construction, vegetation removal, grading, trenching, stockpiling, staging, paving, and other elements in the official Project description. The horizontal APE is illustrated in Figures 1 and 2 and represents the survey coverage area. The horizontal APE includes the Project Area and the Chico AAWTP.



Map Date: 3/27/2025

Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-138.02A Chico Airport Pond Sewer Repair Project

Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aerial_Maps\CASRP Aerials.aprx - CASRP Project Setting 20240603 (lgalvez - 3/27/2025)

Map Date: 3/27/2025

Sources: Maxar, Esri World Imagery

Figure 2. Aerial Overview

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-138.02A Chico Airport Pond Sewer Repair Project

The vertical APE is described as the maximum depth below the surface to which excavations for project foundations and facilities will extend. Therefore, the vertical APE for this Project includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the Project Area and may extend as deep as 10 feet below the current surface; therefore, a review of geologic and soil maps was necessary to determine the potential for buried archaeological sites that cannot be seen on the surface.

The vertical APE also is described as the maximum height of structures that could affect the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. For this Project, the above-surface vertical APE is as high as 10 feet above the surface, which is the presumed maximum height of the proposed stormwater diversion infrastructure and accessory flow monitoring equipment.

1.3 Regulatory Context

The CEQA Lead Agency for this Project is the City of Chico. There is currently no National Environmental Policy Act (NEPA) or Section 106 lead agency for this Project; however, if the Proposed Project would result in impacts to Waters of the U.S., or a jurisdictional levee, then the U.S. Army Corp of Engineers (USACE) would be the likely NEPA or NHPA Section 106 Lead Agency.

A review of the regulatory context is provided below; however, the inclusion of any of these laws and regulations in this report does not make a law or regulation apply when it otherwise would not. Similarly, the omission of any other laws and regulations from this section does not mean that they do not apply. Rather, the purpose of this section is to provide context in explaining why the study was carried out in the manner documented herein.

1.3.1 National Environmental Policy Act

NEPA establishes national policy for the protection and enhancement of the environment. Per NEPA, part of the function of the federal government in protecting the environment is to “preserve important historic, cultural, and natural aspects of our national heritage.” Cultural resources do not need to be determined eligible for the National Register of Historic Places (NRHP) through the National Historic Preservation Act (NHPA) of 1966 (as amended) to receive consideration under NEPA. NEPA is implemented by regulations of the Council on Environmental Quality (40 Code of Federal Regulations [CFR] 1500-1508).

The definition of *effects* in the NEPA regulations includes adverse and beneficial effects on historic and cultural resources (40 CFR 1508.1[i]). When determining the level of NEPA review, federal agencies must analyze if potential effects to historic or cultural resources resulting from the proposed action and each alternative would be significant (40 CFR 1501.3[d]). In considering whether an alternative may “significantly affect the quality of the human environment,” a federal agency must consider, among other things:

- unique characteristics of the geographic area, such as proximity to historic or cultural resources (40 CFR1501.3[d][1] and 40 CFR 1501.3[2][ii]), and

- the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP (40 CFR1501.3[2][v]).

Therefore, because *Historic Properties* are a subset of C*ultural Resources*, they are one aspect of the *Human Environment* defined by NEPA regulations.

1.3.2 National Historic Preservation Act

The federal law that covers cultural resources that could be affected by federal undertakings is the NHPA of 1966, as amended. Section 106 of the NHPA requires that federal agencies consider the effects of a federal undertaking on properties listed in or eligible for the NRHP. The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is defined in 36 CFR 800.16(y):

> A federal undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval.

The regulations that stipulate the procedures for complying with NHPA Section 106 are in 36 CFR 800. The NHPA Section 106 regulations require:

- definition of the APE;
- identification of cultural resources within the APE;
- evaluation of the identified resources within the APE using NRHP eligibility criteria;
- determination of whether the effects of the undertaking or project on eligible resources will be adverse; and
- agreement on and implementation of efforts to resolve adverse effects, if necessary.

The federal agency must seek comment from the State Historic Preservation Officer (SHPO) and, in some cases, the ACHP, for its determinations of eligibility, effects, and proposed mitigation measures. NHPA Section 106 procedures for a specific project can be modified by negotiation of a Memorandum of Agreement or Programmatic Agreement between the federal agency, the SHPO, and, in some cases, the project proponent.

Effects to a cultural resource are potentially adverse if the lead federal agency, with the SHPO's concurrence, determines that the resource is eligible for the NRHP, making it a Historic Property, and if application of the Criteria of Adverse Effects (36 CFR 800.5[a][2] et seq.) results in the conclusion that the effects will be adverse. The NRHP eligibility criteria, contained in 36 CFR 60.4, are as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory.

In addition, the resource must be at least 50 years old, barring exceptional circumstances (36 CFR 60.4). Resources that are eligible for or listed on the NRHP are *Historic Properties*.

Regulations implementing Section 106 of the NHPA (36 CFR 800.5) require that the federal agency, in consultation with the SHPO, apply the Criteria of Adverse Effect to Historic Properties within the APE. According to 36 CFR 800.5(a)(1), an adverse effect is defined as when an undertaking may:

> …alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the [NRHP] in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

1.3.3 California Environmental Quality Act

CEQA is the state law that applies to a project's impacts on cultural resources. A *project* is an activity that may cause a direct or indirect physical change in the environment and that is undertaken or funded by a state or local agency, or that requires a permit, license, or lease from a state or local agency. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, then apply mitigation measures to reduce the impacts.

Per CEQA, a Historical Resource is a resource that:

1. is listed in or is eligible for the California Register of Historical Resources (CRHR) by the State Historical Resources Commission, or has been determined historically significant by the CEQA lead agency because it meets the eligibility criteria for the CRHR;

2. is included in a local register of historical resources, as defined in Public Resources Code (PRC) 5020.1(k); or

3. has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g) (California Code of Regulations [CCR] Title 14, Section 15064.5[a]).

The eligibility criteria for the CRHR are as follows (CCR Title 14, Section 4852[b]):

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

2. The resource is associated with the lives of persons important to local, California, or national history.

3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.
4. The resource has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

In addition, the resource must retain integrity, which is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, Section 4852(c)). Resources that have been determined eligible for the NRHP are automatically eligible for the CRHR.

Impacts to a Historical Resource, as defined by CEQA (listed in an official historic inventory or survey or eligible for the CRHR), are significant if the resource is demolished or destroyed, or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, Section 15064.5(b)). Demolition or alteration of eligible buildings, structures, and features such that they would no longer be eligible would result in a significant impact. Whole or partial destruction of eligible archaeological sites would also result in a significant impact. In addition to impacts from construction resulting in destruction or physical alteration of an eligible resource, impacts to the integrity of setting (sometimes termed *visual impacts*) of physical features within a project area could also result in significant impacts.

Tribal cultural resources (TCRs) are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either listed in or eligible for the CRHR, or are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of TCRs and impacts thereto. Because ECORP does not meet the definition of a California Native American tribe, it only addresses information in this report for which it is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate TCRs. If any California Native American tribe ascribes additional importance or interpretation to archaeological resources described herein, or if the tribe provides information about non-archeological TCRs, such information would be documented separately in the AB 52 tribal consultation record between the tribe and lead agency and summarized in the TCRs section of the CEQA document, if applicable.

1.3.4 U.S. Army Corps of Engineers Regulations

If a project would affect Waters of the United States, the project proponent must meet requirements of Section 404 of the Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act of 1899, and/or Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972, in addition to seeking authorization from the USACE. Apart from the requirements of the NHPA, all Historic Properties are subject to consideration under the USACE's NEPA processes (Appendix B of 33 CFR Part 325), and the USACE's public interest review requirements contained in 33 CFR 320.4. Historic Properties, therefore, are included as a factor in the district engineer's decision on each CWA 404 permit application.

1.4 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP's) *Archaeological Resource Management Reports: Recommended Contents and Format*. Appendix A includes a confirmation of the records search with the California Historical Resources Information System (CHRIS) and historical society coordination. Appendix B contains documentation of a search of the Sacred Lands File. Appendix C presents photographs of the APE. Appendix D contains confidential cultural resource site locations and site records.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code § 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code § 54950 et seq.) protect the confidentiality of Native American cultural place information. Because the disclosure of information about the location of cultural resources is prohibited by the Archaeological Resources Protection Act of 1979 (16 U.S. Code 552 470hh) and Section 307103 of the NHPA, it is exempted from disclosure under Exemption 3 of the federal Freedom of Information Act (5 U.S. Code 552) Likewise, the Information Centers of the CHRIS maintained by the OHP prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution.

2.0 SETTING

2.1 Environmental Setting

The APE is situated within the low alluvial plains and fans to the west of the Sierra Nevada Mountain Range in the northern portion of the Sacramento Valley. The APE is located approximately 3 miles northeast of Big Chico Creek and 6.5 miles northwest of the Sacramento River. Sheep's Hollow Creek flows westward through the southern portion of the APE and eventually converges with Sycamore Creek to the west of the APE. The southern portion of the APE consists of grassland, and the northern portion includes the Chico AAWTP and a portion of the City's active composing facility. The Chico Regional Airport is located to the northwest of the APE. Elevations within the APE range from 185 to 200 feet above mean sea level.

2.2 Geology and Soils

Rosenthal and Willis (2017) describe the geology of the Sacramento Valley as a large asymmetric structural trough (syncline) formed by westward-tilting blocks of plutonic and metamorphic rocks on the eastern side, and highly folded and faulted blocks of metamorphic rocks (Franciscan) on the western side. This basin has been partially filled by a thick sequence (up to 12.4 miles [20 kilometers] thick) of sedimentary rocks and alluvial deposits that range from late Jurassic to Historical in age. During the Pleistocene, erosion of the Sierra Nevada led to the deposition of large alluvial fans at the base of the foothills along the eastern side of the Sacramento Valley. Glacial conditions are generally credited for the deposition of these fans, while subsequent interglacial periods are marked by landscape stability, soil formation, and channel incision. Subsequent depositional cycles during the Holocene progressively buried downstream sections of many older alluvial fans and led to the formation of inset stream terraces and nested alluvial fans along the foothills (Rosenthal and Willis 2017).

According to the U.S. Department of Agriculture National Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2025), the APE contains four mapped soil units (Table 1).

Table 1. Mapped Soil Units within the APE

Map Unit Symbol	Map Unit Name	Soil Description	Drainage Classification	Acreage	Percentage of APE
300	Redsluff gravelly loam, 0 to 2 percent slopes	Fine-loamy alluvium derived from igneous, metamorphic, and sedimentary rock over gravelly alluvium from volcanic rock	Well-drained	1.5	11.7
301	Wafap-Hamslough, 0 to 2 percent slopes	Clayey alluvium over clayey and gravelly alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock	Poorly-Drained	0.8	5.8
302	Redtough-Redswale, 0 to 2 percent slopes	Loamy alluvium over cemented cobbly and gravelly alluvium derived from volcanic rock	Somewhat Poorly Drained	9.7	80.0
991	Xerofluvents, 0 to 4 percent slopes, frequently flooded	Stratified sandy and gravelly alluvium derived from igneous, metamorphic, and sedimentary rock	Somewhat Poorly Drained	0.3	2.5
			Total:	**3**	**100.0**

Note: APE = Area of Potential Effects

The Geologic Map of California (2015) identifies two types of underlying geomorphology within the APE. The northernmost portion of the APE is composed of nonmarine (continental) sedimentary that dates to the Pliocene and Pleistocene eras, comprising mostly loosely consolidated sandstone, shale, and gravel deposits. The remainder of the APE is composed of marine and nonmarine (continental) sedimentary rock that date to the Pleistocene to Holocene era. The marine and nonmarine sedimentary rock are comprised of unconsolidated and semi-consolidated alluvium with the addition of lake, playa, and terrace deposits, which are primarily composed of nonmarine sedimentary rock but include marine deposits near the coast.

The APE has a moderate potential for buried archaeological deposits due to the presence of alluvium from Sheep's Hollow Creek, which bisects the southern portion of the APE. The APE is situated within the alluvial fan of the upper Sacramento Valley, which comprises two geologic formations: the Red Bluff Formation and the Modesto Formation. The northernmost portion of the APE comprises the Red Bluff Formation, which is composed of coarse red gravel with thin beds of reddish clay that date to the Pliocene and Pleistocene (~1.9 million to 22,000 years ago). The remainder of the APE comprises the Modesto Formation, which is composed of alluvium that dates to Pleistocene and Holocene (22,000 to 11,500 years ago). The Red Bluff Formation pre-dates human occupation and is subjected to a broad erosional surface that would have washed cultural resources downhill during a flood event. Although the age of the soil from the Modesto Formation is consistent with human occupation, this timeframe is relatively short (approximately 2,000 to 3,000 years), and the possibility of human occupation near Sheep's Hollow Creek would have been unlikely because Sheep's Hollow Creek is a minor tributary within the greater Sacramento watershed. Indigenous groups would likely have sought subsistence in major streams and waterways, such as Sycamore Creek located 0.60 mile south of the APE. Therefore, soils that date to the latest Pleistocene have a low potential for containing buried archaeological deposits (Meyer and Rosenthal 2008). Overall, the potential for buried pre-contact archaeological deposits within the APE is *moderate to low*; however, these are not the only factors in determining the potential for buried resources; this is discussed further in Section 6.2.

2.3 Vegetation and Wildlife

Prior to the arrival of European-Americans and the start of ranching and farming practices, the vegetation within the APE would have been a California Prairie, composed of a dense-to-open, medium-height bunchgrass community with many forbs. The dominant plant species would have been needlegrass and spear grass (Küchler 1977).

Prior to the arrival of European-Americans, the fauna within and near the APE would have included large game animals such as tule elk and deer and various species of waterfowl. Valley grasslands around the nearby waterways would have supported a variety of bird and mammal species such as elk, pronghorn antelope, grizzly bear, quail, rabbit, and other small mammals (Riddell 1978).

3.0 CULTURAL CONTEXT

3.1 Regional Pre-Contact History

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still alive today. Bones of extinct species have been found but cannot definitively be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 8,000 BP, there was a shift in focus from hunting toward a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 BP, is sometimes referred to as the Millingstone Horizon (Wallace 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to 8,000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

Archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments in sites dating to after about 5,000 BP. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Flaked-stone tools became more refined and specialized, and bone tools were more common. New peoples from the Great Basin began entering Southern California during this period. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. During this period, known as the Late Horizon, population densities were higher than before, and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1925; McCawley 1996; Moratto 1984). These were most likely the basis for the groups that the first Europeans encountered during the 18th century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The presence of small projectile points indicates the introduction of the bow and arrow into the region sometime around 2,000 BP (Moratto 1984; Wallace 1978).

3.2 Local Pre-Contact History

This section provides a regional overview of prehistoric context for California's Central Valley Region, where the APE is located (Rosenthal et al. 2007).

California's Great Central Valley has long held the attention of archaeologists and was a focus of early research in California. Archaeological work during the 1920s and 1930s led to a cultural chronology for central California, presented by Lillard, Heizer, and Fenenga in 1939. This chronology was based on the results of excavations conducted in the lower Sacramento River Valley. This chronology identified three cultures based on artifacts from the archaeological record. These cultures were named Early, Transitional, and Late (Lillard et al. 1939).

Heizer (1949) redefined the description of these three cultures. He subsumed the three cultural groups into three time periods, designated the Early, Middle, and Late horizons. He primarily focused his research and reexamination of Lillard et al. (1939) on the Early Horizon, which he named Windmiller. He also intimated that new research, and a reanalysis of existing data would be initiated for cultures associated with the Middle and Late horizons; however, he did not complete this work and other research filled in the gaps.

Following years of documenting artifact similarities among resources in the San Francisco Bay region and the Delta, Beardsley (1948, 1954) formatted his findings into a cultural model known as the Central California Taxonomic System (CCTS). This system proposed a linear, uniform sequence of cultural succession in Central California, and explicitly defined Early, Middle, and Late horizons for cultural change. Archaeological researchers have subsequently refined and redefined aspects of the CCTS. For instance, Fredrickson (1973, 1974, and 1994) reviewed general economic, technological, and mortuary traits between archaeological assemblages across the region. He separated cultural, temporal, and spatial units from each other and assigned them to six chronological periods: Paleo-Indian (12,000 to 8,000 BP); Lower, Middle, and Upper Archaic (8,000 BP to AD 500) and Upper and Lower Emergent (AD 500 to 1800).

Fredrickson further defined three cultural patterns: The Windmiller (named after Heizer 1949 and Lillard et al. 1939), the Berkeley, and the Augustine patterns, and assigned them to the Early, Middle, and Late horizons of the CCTS. These patterns were defined to reflect the general sharing of lifeways within groups in a specific geographic region. The Windmiller pattern of the Early Horizon included cultural patterns dating from 5,000 to 3,000 BP; the Berkeley Pattern of the Middle Horizon (also known as the Cosumnes Cultural Pattern after Ragir 1972), included cultural patterns dating from 3,000 BP to AD 500, and the Augustine Pattern of the Late Horizon included the cultural patterns from AD 500 to the historic period.

Fredrickson's (1974) Paleo-Archaic-Emergent cultural sequence was redefined by Rosenthal, White, and Sutton (2007). Rosenthal et al.'s recalibrated sequence is divided into three broad periods: The Paleoindian Period (11,550 to 8,550 BP); the three-staged Archaic period, consisting of the Lower Archaic (8,550 to 5,550 BP), Middle Archaic (5,550 to 550 BP), and Upper Archaic (550 BP to AD 1100); and the Emergent Period (AD 1100 to Historic) (Rosenthal et al. 2007). The three divisions of the Archaic Period correspond to climate changes. This is the most recently developed sequence and is now commonly used to interpret Central California pre-contact history. The aforementioned periods are characterized by the following:

3.2.1 Paleo-Indian Period

This period began when the first people began to inhabit what is now known as the California culture area. It was commonly believed these first people subsisted on big game and minimally processed foods, (i.e., hunters and gatherers), presumably with no trade networks. More recent research indicates these people may have been more sedentary, relied on some processed foods, and traded (Rosenthal et al. 2007). Populations likely consisted of small groups traveling frequently to exploit plant and animal resources.

3.2.2 Archaic Period

This period was characterized by an increase in plant exploitation for subsistence, more elaborate burial accoutrements, and an increase in trade network complexity (Bennyhoff and Fredrickson 1994). The three divisions that correspond to pre-contact climate change is characterized by the following aspects (Rosenthal et al. 2007):

3.2.2.1 Lower Archaic Period

This period is characterized by cycles of widespread floodplain and alluvial fan deposition. Artifact assemblages from this period include chipped stone crescents, early wide-stemmed projectile points, marine shell beads, Eastern Nevada obsidian, and obsidian from the North Coast Ranges. Artifacts found within resources dating to this period indicate that trade was occurring in multiple directions. A variety of plant and animal species were also exploited, including acorns, wild cucumber, and manzanita berries.

3.2.2.2 Middle Archaic Period

This period is characterized by a drier climate period. Rosenthal et al. (2007) identified two distinct settlement and subsistence patterns in this period: the Foothill Tradition and the Valley Tradition. The

Foothill Tradition artifact assemblages consist primarily of locally sourced flaked-stone and groundstone cobbles. The Valley Tradition was generally characterized by diverse subsistence practices and extended periods of sedentism.

3.2.2.3 Upper Archaic Period

Characteristic artifacts from this period consist of more specialized artifacts such as bone tools, ceremonial blades, polished and groundstone plummets, saucer and saddle Olivella shell beads, Haliotis shell ornaments, and a variety of groundstone implements. This is indicative of much greater cultural diversity compared to artifact assemblages from previous periods.

3.2.3 Emergent Period

This period is most notably marked by the introduction of the bow and arrow, the emergence of social stratification linked to wealth, and more expansive trade networks signified by the presence of clam disk beads that were used as currency (Moratto 1984). The Augustine pattern (the distinct cultural pattern of the Emergent Period) is characterized by the appearance of small projectile points (largely obsidian), rimmed display mortars, flanged steatite pipes, flanged pestles, and incised bird-bone tubes, typically with a chevron design. Large mammals and small seed resources appear to have made up a larger part of the diet during this period (Fredrickson 1968, Meyer and Rosenthal 1997).

The following discussion summarizes the cultural patterns and the different local developments represented in archaeological deposits in the region.

The Windmiller Pattern of the Early Horizon (as defined by Beardsley 1948), dates to the Middle Archaic (as defined by Rosenthal et al. 2007) and may be the most extensively studied of all the cultural patterns defined for the Central Valley. In fact, the similarity noted between elements of Windmiller and materials from other resources may have been the catalyst for early archaeologists identifying the material cultural blending of groups in the Central Valley during this period. The temporal span for Windmiller has been updated and reanalyzed several times in archaeological literature (Fredrickson 1973, 1974; Heizer 1949; Moratto 1984; Ragir 1972). The date originally proposed for the emergence of Windmiller was 4,500 BP (Lillard et al. 1939, Ragir 1972), because the culture at 4,000 years ago appeared to have been fully developed and seemed to have been well integrated into the regional economic system.

Characteristics to identify the Windmiller pattern have been presented by multiple authors over time (Fredrickson 1973, 1974; Heizer 1949, Moratto 1984, Ragir 1972). Most notable characteristics are:

- Large, heavy stemmed and leaf-shaped projectile points commonly made of a variety of materials other than obsidian;
- Perforate charmstones;
- *Haliotis* and *Olivella* shell beads and ornaments;
- Trident fish spears;
- Baked clay balls (presumably for cooking in baskets);

- Flat slab milling stones;
- Small numbers of mortars; and
- Ventrally extended burials oriented toward the west.

The subsistence pattern of Windmiller groups probably emphasized hunting and fishing, with supplemental seed collecting (possibly including acorns) (Heizer 1949; Moratto 1984; Ragir 1972).

Windmiller groups acquired obsidian from at least two coastal mountain ranges and three trans-Sierran sources, *Haliotis* and *Olivella* shells and ornaments were acquired from the coast, and quartz crystals were from the Sierra Nevada foothills (Heizer 1949; Ragir 1972). It is widely hypothesized that the bulk of these materials were acquired through trade; however, some may have been acquired as part of seasonal movements between the Central Valley and the Sierra Nevada foothills.

There is evidence for seasonal transhumance in the distribution of Windmiller artifacts, sites, and burial patterns. Johnson's work (1967, 1970) along the edge of the Sierra Nevada foothills at Camanche Reservoir and CA-AMA-56, the Applegate site, suggests a link between Windmiller groups of the Central Valley and the Sierra Nevada mortuary caves. Johnson (1970) suggested that his data reveals a pattern of gradual change from the Early Horizon through the Middle Horizon (as defined by Beardsley 1948), rather than a displacement of local groups by foreign populations as theorized by Baumhoff and Olmsted (1963) based on ethnolinguistic evidence. Rondeau (1980) also worked at the edge of the Central Valley at CA-ELD-426, the Bartleson Mound, and identified components of the Early Horizon (as defined by Beardsley 1948). A potential relationship between the Early Horizon cultures and the Martis Complex (a basalt preferring culture in the Martis Valley of the Sierra Nevada), was postulated. In addition, analysis of Windmiller burial orientation (Schulz 1970) and skeletal analyses (e.g., Harris Lines) by McHenry (1968) suggest a high percentage of winter death among Windmiller groups. Incorporating all of this data, Moratto (1984) postulated that Windmiller groups were exploiting the foothills of the Sierra Nevada during the summer and returning in the winter to villages in the Central Valley as early as 4,000 BP.

Excavations at CA-PLA-500 (Wohlgemuth 1984), the Sailor Flat site located near CA-PLA-101, sites at the Twelve Bridges Golf Course, now the Catta Verdera Golf Course, in Lincoln, and the Spring Garden Ravine site CA-PLA-101 provide examples of Windmiller sites that had items in their cultural assemblages similar to the material culture of groups elsewhere in California and the foothills.

The succeeding Middle Horizon, namely the Cosumnes Culture after Ragir (1972), the Berkeley Pattern after Fredrickson (1974), and absorbed into the Middle and Upper Archaic designations by Rosenthal et al. (2007) was first recognized at site CA-SAC-66. Much less-published material discusses the patterns defined for this era than does Windmiller. None the less, some of the most notable characteristics are:

- Tightly flexed burials with variable orientation;
- Red ochre stains in burials;
- Distinctive *Olivella* and *Haliotis* beads and ornaments;
- Distinctive charmstones;

- Cobble mortars and evidence of wooden mortars;
- Numerous bone tools and ornaments;
- Large, heavy foliate and lanceolate concave base projectile points made of materials other than obsidian; and
- Baked clay objects.

Further classification of the Middle Archaic (as defined by Rosenthal et al. 2007) into the Foothills Tradition and Valley Tradition helped to clarify the different types of cultural sequences, which occurred during these time periods. Functional artifact assemblages consisting primarily of locally sourced flaked-stone and groundstone cobbles characterize the Foothills Tradition, with very few trade goods. Resources that represent the Valley Tradition are much fewer in number and are generally characterized by much more diverse subsistence practices and extended periods of sedentism. Specialized tools, trade goods, and faunal refuse that indicate year-round occupation are evident in resource of the Valley Tradition (Rosenthal et al. 2007). Distinct artifacts attributed to this tradition include one of the oldest dated shell bead lots in central California (4,160 BP) and a particular type of pestle used with a wooden mortar (Meyer and Rosenthal 1997).

The Sierra Nevada experienced significant climactic shifts and concomitant vegetation change throughout the Holocene, but pollen analysis and climactic records indicate that the current climate pattern and primary constituents of vegetation communities were in place by the Middle Archaic around 1,000 BC (Hull 2007). Seasonal transhumance practiced by indigenous populations of the Sierra may have become more consistent during this period of relative environmental stasis.

Paleobotanical analysis from resources of the Foothills Tradition including CA-CAL-789, CA-CAL-629, and CA-CAL-630 confirm that acorns and pine nuts were preferred for subsistence (Rosenthal and McGuire 2004; Wohlgemuth 2004). Resources near the APE associated with the Valley Tradition are rare in the early Middle Archaic (ca. 5,550 to 2,050 cal. BP) but include the Reservation Road site (CA-COL-247), and two buried resources in the northern Diablo range (CA-CCO-637 and CA-CCO-18/548). Resources associated with later portions of the Middle Archaic (post-2,050 cal. BP) near the APE include CA-SAC-107 and CA-BUT-233, both of which produced elaborate material culture and diverse dietary and technological assemblages.

The next era in the region is identified as the Late Horizon by Beardsley (1948, 1954), the Hotchkiss Culture by Ragir (1972), and the Augustine Pattern by Fredrickson (1974). The culture was formed by populations during the later Upper Archaic and Emergent Periods, as defined by Rosenthal et al. (2007), and ranges in age from around 550 cal. BP to contact (dates vary between the different models of prehistory developed for the region). The Upper Archaic, as discussed above, corresponds with the late Holocene change in environmental conditions to a wetter and cooler climate. The Emergent Period and Late Horizon are markedly represented by the introduction of bow and arrow technology, as well as more pronounced cultural diversity as reflected in diversity of burial posturing, artifact styles, and material culture. Cultural patterns for this era are represented in the northern Sacramento Valley, namely within the

Whiskeytown Pattern, at sites CA-SHA-47, CA-SHA-571/H, CA-SHA-890, CA-SHA-891, and CA-SHA-892 (Sundahl 1982, 1992).

This era primarily represents both local innovation and the blending of new cultural traits introduced into the Central Valley. The Emergent Occupation (as defined by Rosenthal et al. 2007) coincides with the Augustine Pattern (Fredrickson 1974) in the lower Sacramento Valley/Delta region, and with the Sweetwater and Shasta complexes in the northern Sacramento Valley (Fredrickson 1974; Kowta 1988; Sundahl 1982). The emergence of the Augustine Pattern appears to have been associated with the expansion of Wintun populations from the north, which appears to have led to an increase in settlements in the area after 550 BP (Bennyhoff 1994; Moratto 1984).

During this period in the Sierra Nevada, paleoenvironmental data suggests severe droughts occurred from around AD 892 to 1112 and AD 1210 to 1350 (Hull 2007; Lindström 1990; Stine 1994). These drier conditions surely affected the seasonal resource procurement rounds of the native populations during this time, and likely led to an influx of population movement and cultural blending into the foothills zone and Central Valley by Sierra Nevada groups.

Despite the varying designations, this emergent era is distinguished in the archaeological record by intensive fishing, extensive use of acorns, elaborate ceremonialism, social stratification, and cremation of the dead. Artifacts associated with the defined patterns (Augustine, Emergent, Hotchkiss) include bow-and-arrow technology (evidenced by small projectile points), mortars and pestles, and fish harpoons with unilaterally or bilaterally placed barbs in opposed or staggered positions (Bennyhoff 1950). Mortuary patterns include flexed burials and cremations, with elaborate material goods found in association with prestigious individuals. A local form of pottery, Cosumnes brown ware, emerged in the lower Sacramento Valley (Rosenthal et al. 2007). Sites contain this ceramic type in their artifact assemblage near the APE include CA-SAC-6, CA-SAC-67, CA-SAC-107, CA-SAC-265, and CA-SAC-329. Human animal effigies are also a marker of this emergent era around the APE and are present at sites CA-SAC-6, CA-SAC-16, CA-SAC-29, and CA-SAC-267.

3.3 Ethnohistory

The Konkow, or Northwestern Maidu, occupied the Northern Sacramento Valley and the surrounding foothills of the Sierra Nevada range. The Maidu have been differentiated into three major related divisions based on cultural and linguistic differences: the Northeastern (Mountain Maidu), Northwestern (Konkow), and Southern (Nisenan) (Dixon 1905; Kroeber 1925).

Powers (1877), Dixon (1905), and Kroeber (1925) have provided the earliest documentation of the Maidu and Konkow, and their thorough observations have depicted the life and culture of these related groups. Additional ethnographic descriptions for the Maidu and Konkow can be found in Riddell (1978), Hill (1970), and Kowta (1988), among others. An in-depth description of Maiduan material culture and resource exploitation has been included in Johnson and Theodoratus (1978). Because Maidu and Konkow are believed to have been so closely related, ethnographers tended to group them as one.

Konkow occupied territory immediately to the southwest of the Mountain Maidu, along the Feather and Sacramento rivers to their southern boundary at the Sutter Buttes. The Konkow were primarily located in the lower elevations of the Sierra Nevada and along the valley floor (Riddell 1978). Tribal territories adjacent to the Maidu and Konkow included the Atsugewi and Yana to the north, the Nomlaki and Patwin to the west, the Paiute and Washoe to the east, and the Nisenan to the south (Heizer 1978).

The settlement patterns of the Maidu and Konkow were seasonal. Konkow inhabited a savanna-like habitat on the valley floor and in the lower elevations of the Sierra foothills during the winters. Resources exploited in this environment include wild rye, pine nuts, acorns, fish, and invertebrates (Kroeber 1925; Riddell 1978). Summers in the mountains gave them access to deer meat, skins, and other items for food, clothing, and shelter for the winter months.

The village community, the primary settlement type among the Maidu-Konkow, consisted of three to five small villages, each composed of about 35 members. Among the mountain Maidu, village communities were well defined and based on geography. In contrast, the Konkow were dispersed throughout the valley floor along river canyons, and as a result, village communities were less concentrated or definable (Kroeber 1925). In terms of permanent occupation sites, both groups preferred slightly elevated locations that provided visibility of the surrounding area and were away from the water-laden marshes and meadows (Dixon 1905; Riddell 1978; Riddell and Pritchard 1971). The Mechoopda Village, formerly located near downtown Chico, was home to many Maidu well into historical times.

Among the villages, the male occupant of the largest *kum*, or semi-subterranean earth-covered lodge, governed the community (Dixon 1905; Kroeber 1925; Riddell 1978). Two other types of ethnographically documented structures in use included the winter-occupied conical bark structure and the summer shade shelter (Riddell 1978).

Clothing, accessories, and other personal items were manufactured using elaborate basket weaving techniques, shell, and bone ornamenting, and by incorporating feathers, game skins, plant roots, and stems into objects (Riddell 1978). Shell, in the form of beads for currency or as valuable jewelry, was very desirable and was exchanged for food, obsidian, tobacco, and pigments (Kroeber 1925; Riddell 1978).

3.4 Regional History

The Spanish maritime explorer Juan Rodríguez Cabrillo became the first European to visit California. The Viceroy of New Spain (Mexico) sent Cabrillo north in 1542 to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English privateer Francis Drake visited a Miwok village north of San Francisco Bay in 1579. Sebastian Vizcaíno, sailing north from Mexico, explored the California coast as far north as Monterey Bay in 1602 (Starr 2005).

The Spanish settlement of California began in 1769 with the Portolá land expedition. The expedition, led by Captain Gaspar de Portolá, a Spanish military officer, and Father Junipero Serra, a Franciscan friar, traversed the California Coast Ranges from San Diego to Monterey Bay. Spain subsequently established a string of 21 Franciscan missions, four presidios (forts), and four pueblos (towns). All reinforced Spanish economic, military, political, and religious authority in California (Starr 2005). The Spanish explorer Gabriel Moraga led an expedition from San Jose into the Central Valley in 1808. Moraga named the valley’s major rivers, including the Sacramento and San Joaquin, but made no effort to establish new missions, presidios, or pueblos (Avella 2003).

The Republic of Mexico achieved independence from Spain in 1821. A year later, Alta California became a territory of Mexico with its capital at Monterey. In 1827, the American fur trapper Jedediah Smith led a party associated with the Rocky Mountain Fur Company across the Mojave Desert to Southern California, up the Central Valley, and into Nevada, demonstrating the possibility of overland travel across the Sierra Nevada mountains (Starr 2005).

Between 1834 and 1836, the Mexican government confiscated mission lands and expelled Alta California's Franciscan friars. Mexican governors of Alta California proceeded to grant former mission lands, along with unclaimed lands in the Sacramento and San Joaquin valleys, to retired soldiers and other Mexican citizens, including immigrants. Much of the Alta California coastal regions and interior valleys became private *ranchos*, or cattle ranches. Three pueblos established by Spain—Los Angeles, San Jose, and Sonoma—survived as small settlements. Other settlements developed around the presidios at San Francisco, Monterey, Santa Barbara, and San Diego. Many rancho owners maintained residences in town, while hired hands and Native American laborers worked on ranchos (Starr 2005).

After 1821, the Mexican government began welcoming non-Spanish immigrants to Alta California. Hundreds of Americans, British, and other foreigners arrived to establish trading relations or to apply for land grants. John Sutter, a German-speaking immigrant from Switzerland, built a fort at the confluence of the Sacramento and American rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant; he received nearly 49,000 acres along the Sacramento River in 1841. Sutter built a flour mill and grew wheat near the fort (Hurtado 2006).

Following the Mexican-American War (1846-1848), Mexico ceded Alta California and other western territories to the U.S. Under the Treaty of Guadalupe Hidalgo, the U.S. Congress agreed to protect the property rights of Mexican nationals living within the new boundaries of the U.S. This meant honoring Mexican land grants in California. In 1851, Congress passed the California Land Act creating the Board of Land Commissioners to determine the validity of individual Mexican grants, placing the burden of proof on individual patentees. The Board, with assistance from U.S. courts, confirmed most of California's Mexican land grants in subsequent decades (Starr 2005).

In January 1848, one of John Sutter's hired laborers, James Marshall, discovered gold in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River. News of the discovery spread around the world in 1848, leading to the 1849 California Gold Rush. Tens of thousands of prospectors arrived in Northern California through the early 1850s. Hundreds of mining camps appeared along the streambeds of the Sierra Nevada foothills. The cities of Marysville, Sacramento, and Stockton sprang up in the Sacramento and San Joaquin valleys as supply centers for the mines; San Francisco became California's largest city and the focal point for all Gold Rush economic activity. In 1850, following a year of rapid growth and economic development, Congress admitted California as the 31st U.S. state (Starr 2005). In the following decades, federal surveyors arrived in California to stake out 36-square-mile townships and 1-square-mile sections on California's unclaimed public lands. At general land offices, buyers paid cash for public lands. After 1862, many filed homestead applications to obtain 40, 80, and 160-acre tracts at low upfront costs in exchange for establishing farms (Robinson 1948).

3.5 Butte County History

The Mexican governors of Alta California, Manuel Micheltorena and Pio Pico, made six land grants in 1844 and 1845 that covered arable lands located between the Sacramento and Feather rivers north and east of the Sutter Buttes. These included ranchos Arroyo Chico, Farwell, Esquon, Aguas Frias, Llano Seco, and Fernandez. During the California Gold Rush, thousands arrived in the northern Sierra Nevada foothills to mine the Feather River and its tributaries for placer gold, prompting the creation of Bidwell Bar, Oroville, and other mining camps. Butte County became one of California's original 27 counties in 1850; Oroville became its county seat in 1856. John Bidwell, one of the earliest Americans to settle in California, discovered gold in Butte County on the Feather River in 1848. Bidwell made a small fortune as a miner and merchant during the early days of the Gold Rush. In 1849 he acquired the 22,000-acre Arroyo Chico rancho and turned his attention to agriculture. In 1860, Bidwell established the town of Chico on the Arroyo Chico rancho. A decade later he helped to organize the California & Oregon Railroad, which traversed the western flatlands of Butte County to Chico and points farther north (Bidwell Mansion Association 2023). The railroad's arrival led to the creation of Gridley, Biggs, Nelson, Nord, and other small towns and settlements along its tracks. After 1870, grain farming and livestock grazing became important activities in western Butte County. Logging and lumber milling gradually eclipsed mining in the county's eastern foothills and mountains. Turn-of-the-century irrigation projects diversified Butte County's agricultural output to include rice, almonds, fruit, and olives, as well as alfalfa and dairy farming.

3.5.1 History of the City of Chico

Chico was founded by General John Bidwell, who arrived on one of the first wagon trains to reach California in 1843. Bidwell arrived at Sutter's Fort in what would become Sacramento and became an employee of Sutter. Bidwell fought in the Mexican War and discovered gold on the Feather River during the Gold Rush (Britannica 2018). The Mexican land grant of Rancho Arroyo Chico was granted to William Dickey in 1844. In two separate purchases, Bidwell purchased portions of Rancho Arroyo Chico from Dickey in 1849 and 1851. He received a patent (federal deed) for the land grant in 1860. Bidwell became the state's leading horticulturalist and served in the State Senate and the U.S. House of Representatives. Bidwell ran unsuccessfully for governor of California on the Republican ticket several times. He died in 1900 (Britannica 2018). Bidwell Park was created when Annie Bidwell signed a grant deed donating 1,903 acres to the people of Chico.

Bidwell established the town of Chico in 1860, when he asked the County Surveyor to survey the area into town lots and streets. Chico was incorporated as a city in 1872. Economic activities around Chico included logging, ranching, and farming. In 1874, the Butte Flume and Lumber Company completed a flume to carry logs from Butte Meadows down Big Chico Creek. This flume was later used to supply lumber to the Diamond Match Company in Chico. Chico developed as an agricultural-processing center, especially for almonds, rice, and fruit (Britannica 2011).

In 1887, the California legislature established the Northern Branch of the State Normal School of California at Chico, for which Bidwell donated land from his cherry orchard. This school was successively known as Chico Normal School, Chico State College, and California State University, Chico.

The California & Oregon Railroad Company and Yuba Railroad Company completed their line to Chico from Roseville in 1870. This railroad was purchased by the Central Pacific Railroad, which completed its route north to Redding in 1872. The Central Pacific Railroad became part of the Southern Pacific Railroad system in 1889. The Sacramento Northern Railroad, an electric interurban line, completed its route from Oakland to Chico in 1913 (Robertson 1998).

3.5.2 Chico Army Airfield

The Chico Army Airfield was located 5 miles north of the City of Chico, in the present-day location of Chico Regional Airport. The airfield started as a small local airport in the City of Chico in the late 1930s and expanded in the 1940s to support the needs of the U.S. Department of Defense. On September 11, 1941, the City signed a lease to the USACE for the use of the 1,045-acre airport, which included an agreement with the City to provide utilities and services, and roads to support the Airfield (Chico Redevelopment Agency 2004).

On April 14, 1942, the Chico Army Airfield base opened and served as one of many airfields in Northern California to support the war effort during World War II. Operated by the U.S. Army Air Corps (the predecessor to the U.S. Air Force), this airfield served as a flying school to train cadets to become pilots, as well as basic training for the war effort during World War II. The Airfield was deactivated on December 31, 1945. The property was transferred by the U.S. Army to the General Services Administration (GSA), and the lease was terminated on June 9, 1948. The GSA transferred the property to the City of Chico (Chico Redevelopment Agency 2004) on January 28, 1949. The City of Chico received the following facilities from the former Chico Airfield: airport facilities, a street system, a water system, an electrical distribution system, a sanitary sewage system, several steel frame aircraft hangars, temporary wooden military buildings, a railroad line, and various mobile equipment (Chico Redevelopment Agency 2004).

Based on archival research, the City of Chico identified a sanitary sewage system as one of the facilities constructed by the Army. Information regarding a specific date of construction or engineering plans is unknown (Ruhge 2017). However, based on aerial photographs, the Chico AAWTP is visible within the APE by 1947.

3.6 Wastewater Treatment Plants

The Chico AAWTP likely served as a wastewater treatment for the Chico Army Airfield base. Wastewater treatment plants receive wastewater from domestic, industrial, or commercial sources and treat it by removing material before the water is discharged into receiving streams or bodies of water. These facilities have up to three stages of wastewater treatment: 1) Primary Treatment: setting out large, suspended solids by screening and sedimentation, 2) Secondary Treatment: additional treatment by biological processes to break down organic matter remaining in the sewage, 3) removing nutrients such as phosphors, nitrogen, most biochemical oxygen demands, and suspended solids (California State Water Boards 2025).

After treatment is completed, the byproduct (e.g., sludge) is processed further to reduce the volume of sludge and facilitate disposal or reuse. The plant also has systems for treating byproducts, like sludge drying beds or lagoons, where residual materials are dewatered before disposal. These treatment plants are designed to be operationally flexible so that different components can run in parallel or series to accommodate fluctuating water demands while meeting water quality standards (JRP Historical Consulting, LLC [JRP] and AECOM 2023).

3.6.1 Clarifiers

Clarifiers, also known as settling tanks or sedimentation basins, serve to calm the influent (e.g., wastewater flowing into a treatment plant), holding it without agitation for several hours while the large, suspended particles settle to the bottom of the tank (JRP and AECOM 2023). Clarifiers have two processes: a primary clarifier, which treats the wastewater at the start of the treatment process, and a secondary or final clarifier, which serves as a biological secondary treatment to remove any remaining bits of suspended material (JRP and AECOM 2023). A clarifier also contains a mechanical skimmer and rake system to collect buoyant grease and heavier sludge for subsequent processing and disposal. Older clarifiers, circa 1940s to 1970s, were constructed in a circular form measuring 20 to 200 feet in diameter.

3.6.2 Trickling Filters

A trickling filter, also known as a “trickle filter”, “sprinkling filter” or “biofilter”, consists of a raised, circular concrete vessel filled with media over which wastewater is sprayed from a rotating arm (JRP and AECOM 2023). Traditionally, crushed stones or bricks filled the bottom of the filter (JRP and AECOM 2023). This type of filter serves as a biological secondary treatment in wastewater management, which allows a layer of slime to coat a fill material (e.g., crushed stones or bricks) with bacteria that break down the organic waste and produce clean water.

3.6.3 Sludge Drying Beds/Lagoon

A sludge drying bed or a lagoon is a shallow, artificially constructed pond, typically earthen-filled or covered with a plastic lining, where sunlight, bacterial action, and oxygen work to purify wastewater. It can also be used as a storage pond for wastewater (California State Water Boards 2025).

3.7 History of Flood Control

The Sacramento Valley experienced extensive flooding in the early years of California statehood. In response, private landowners along the State’s waterways constructed small levees (between 3 and 4 feet tall) near their farms. This was a pattern repeated by most landowners along rivers in the Sacramento Valley. These levees, however, proved ineffective and failed during the catastrophic floods of this early period (Crawford and Herrick 2006; McGowan 1961; O’Neill 2006). As the floods worsened, landowners attempted to build higher levees, but these too proved ineffective (McGowan 1961).

California was included in the Federal Swamp Land Act of 1850, which allowed the State to reclaim its wetlands through the construction of levees. The program, however, was riddled with corruption and problems, which hampered levee construction (O’Neill 2006; Shaw and Fredine 1956). A concentrated effort at levee construction began in the early 1860s as hydraulic mining increased and flooding continued to be a significant problem for farmers in the Sacramento Valley. The state legislature tried to coordinate a levee system and control levee construction by creating the Swamp Land Commission.

Modeled after districts in Mississippi, the legislation created California drainage districts, which were permitted to grant the power to construct levees. It would become the responsibility of state engineers to design the levees for each district. By the end of the first year, there were 28 districts. As the legislation produced only minor, tangible benefits, the legislature enhanced levee district powers in 1864, which spurred more levee construction (O'Neill 2006).

Flooding has naturally occurred in the region and much of Northern California prior to European settlers entering the region. Historic accounts of floods in the early and mid-1800s state that all of Sutter County was more or less inundated for the whole winter season (Thompson and West 1880). After a flood in 1853, Yuba City was completely inundated except for the Native American Rancheria on the bank of the river (Thompson and West 1880). The next disastrous flood was in December 1861; the garden at the Hock Farm was covered with 2 to 4 feet of water (Thompson and West 1880). This flood caused the Bear River to re-channelize to the south along its present-day course (Thompson and West 1879).

As hydraulic mining increased in the early 1860s and flooding continued to be a significant problem for farmers in the Sacramento Valley, a concentrated effort at levee construction began. Hydraulic mining in the Sierra Nevada turned to the more *efficient* methods of hydraulic mining, the use of environmentally destructive high-pressure water jets washed entire mountainsides into local streams and rivers. Hydraulic mining was considered a breakthrough technology for miners, but residents and farms downstream dealt with the impacts. Hydraulic mining clogged creeks and rivers with a high amount of debris that settled at the riverbeds of the Yuba and Feather rivers and began to raise the water levels around 1868. Hydraulic mining was outlawed in 1884, yet independent hydraulic mining continued into the 1920s. Dredging operations began adjacent to rivers in 1900, and dredging could reach gold-bearing gravels that had been buried by past hydraulic tailings.

Levee construction and flood control management began to become organized in 1868 with the passage of the Green Act. The act eliminated the limit on the number of swampland acres allowed under the federal swampland program and transferred the task of creating levee districts to landowners (O'Neill 2006). The Green Act promoted extensive levee building in flood-prone areas of California (McGowan 1961; O'Neill 2006).

Levee construction and flood control encountered setbacks during the 1880s and 1890s as the fight between miners and farmers continued. Although hydraulic mining was outlawed in 1884, farmers and miners continued to feud due to the sediment in the rivers from mining activities that was choking the water supply for irrigation. Local reclamation districts continued to build levees intermittently in select locations, including on the west bank of the Sacramento River. These levees were somewhat effective in raising the floodplain, protecting the local lands, and blocking natural outlets, but flood problems were still created for residents farther down the river during the first part of the 20th century (O'Neill 2006). This eventually prompted improvements in the levees so flood water could be redirected elsewhere resulting in flood control improvement and development downstream by the turn of the 20th century (McGowan 1961; O'Neill 2006).

Despite the progressive efforts to control water in the Sacramento River watershed, the Sacramento River flooded again in 1903 and 1904, prompting the creation of a statewide lobbying organization in 1904 for increasing state government assistance for landowners and local government agencies building river improvements. The governor created a Board of River Engineers, which was staffed with experienced engineers whose recommendation was to relieve stress on the levees by constructing weirs that would temporarily allow excess water to bypass the river channel until a proper channel depth could be achieved. The California Board of Trade was pushing for the construction of more levees, ultimately leading to the legislature's rejection of the engineers' plan (O'Neill 2006).

The state agenda focused heavily on levee building until 1911, when Thomas H. Jackson, a California Debris Commission member, designed a comprehensive flood control plan that employed more innovative methods. The federal government accepted this approach, and a special session of the state legislature approved California's support and participation in the new flood control plan. Lobbying efforts continued to press the federal government, and the Flood Control Act was passed in 1917. The Act required USACE to work with state governments and local levee districts, provided $5.6 million to construct flood control facilities in the Sacramento Valley, and authorized the creation of the Sacramento River Flood Control Project (SRFCP), which provided for the construction of the Yolo and Sutter bypasses. The SRFCP eventually involved 980 miles of levee construction providing flood protection to about 800,000 acres of agricultural lands, as well as the cities of Yuba City, Marysville, Sacramento, and numerous smaller communities in the region (O'Neill 2006).

3.7.1 Chico-Mud Creek-Unit 3 East Sycamore RT levee system

In 1944, USACE authorized the Chico and Mud Creeks and Sandy Gulch Improvement and Levee Construction as part of the Sacramento-San Joaquin River Basin flood control projects. The project provided protection from flooding from Big Chico Creek, Sandy Gulch, Sycamore Creek and Mud Creek.

According to the USACE's National Levee Database (USACE 2025), the Chico-Mud Creek-Unit 3 East Sycamore RT (Right Toe) levee system was slated for construction in the 1950s; however, due to a flooding event in Chico in 1955, the USACE modified the levee plans. These modifications included construction of a diversion channel to facilitate water flow from Big Chico Creek around the western side of the City and drain into the Sacramento River. The Chico-Mud Creek-Unit 3 East Sycamore RT Levee was constructed in 1965.

4.0 METHODS

4.1 Personnel Qualifications

Registered Professional Archaeologist (RPA) Brian S. Marks, Ph.D. who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeology, was responsible for this cultural resources investigation. Archaeologists Arik J. K. Bord, RPA and Justin Rohde, RPA conducted the fieldwork. Archaeologist Erica Ramirez-Schroeder, RPA prepared the technical report. Architectural Historian, Jeremy Adams, who meets the Secretary of the Interior's Professional Qualifications for History, oversaw the architectural history evaluations. Lisa Westwood, RPA provided technical report review and quality assurance.

Dr. Marks, RPA is the Principal Investigator and has been an archaeologist since 1997. He has been working in cultural resources management in California since 2010, following eight years of archaeological work in the southeast United States. Dr. Marks holds a Ph.D. and an M.S. in Anthropology. He has participated in or supervised more than 200 surveys, testing, and data recovery excavations and has recorded and mapped a multitude of pre-contact and historical sites, including Civil War battlefields, Gold Rush boom towns, submerged pre-contact sites, and others. He has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR and is well-versed in impact assessment and the development of mitigation measures for CEQA and Section 106 (NHPA) projects. Dr. Marks is the Northern California Cultural Resources Group Manager for ECORP.

Jeremy Adams meets the Secretary of the Interior’s Standards for Architectural History and History. He holds an M.A. in History (Public History) and a B.A. in History and has 15 years of experience specializing in historic resources of the built environment and is skilled in carrying out historical research at repositories such as city, state, and private archives, libraries, CHRIS information centers, and historical societies. He has experience conducting field reconnaissance and intensive surveys and has conducted evaluations of cultural resources for eligibility to the NRHP and CRHR.

Arik J. K. Bord, RPA meets the Secretary of the Interior’s Professional Qualifications Standards for prehistoric and historical archaeology with more than 10 years of experience in Anthropology and Archaeology, particularly in California and the Great Basin, as well as the Caribbean, and the Florida Gulf. He has experience working in both terrestrial and maritime environments and is proficient with most aspects of archaeological laboratory and fieldwork methods, including curation and conservation of archaeological and cultural materials, survey, excavation, data recovery, mapping, analysis, 3D reconstructions, development of field and laboratory methods, public outreach, academic scholarship, and teaching. He holds an A.A. in Social and Behavioral Sciences, B.A. and M.A. degrees in Anthropology, and is currently completing his Ph.D.

Justin Rohde, RPA has more than 20 years of experience conducting field surveys throughout California, Oregon, and Washington, including nearly eight years conducting archaeological investigations under the Secretary of Interior's Professional Qualification Standards. Rohde is a member of the Register of Professional Archaeologists, completing his master's degree in 2017 focused on the prehistory of northwestern California and southwestern Oregon. Rohde has previously worked as an archaeologist for the Bureau of Land Management (BLM) and U.S. Forest Service, in addition to numerous Cultural Resource Management firms, often directing complex landscape level projects, testing and excavation, monitoring, and site recording. Rohde has served as Lead Archaeologist, Resource Advisor, and firefighter on major wildfire incidents.

Erica Ramirez-Schroeder, RPA is an archaeologist with 7 years of experience in California cultural resources management and meets the Secretary of the Interior’s Professional Qualifications Standards for prehistoric and historical archaeology. She has experience in many aspects of archaeological fieldwork, laboratory, and reporting. These include archaeological surveys, excavation, monitoring, artifact collection management, artifact analysis, CHRIS record searches, preparation of California Department of Parks and Recreation (DPR) forms, and ground penetrating radar. She holds a B.A. in History and an M.A. in Cultural Resources Management.

Lisa Westwood, RPA has 30 years of experience and meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historical archaeology. She holds a B.A. in Anthropology and an M.A. in Anthropology (Archaeology). She is the Director of Cultural Resources for ECORP.

4.2 Records Search Methods

ECORP conducted a records search for the APE at the Northeast Information Center (NEIC) of the CHRIS at California State University, Chico on February 20, 2025 (NEIC File No. NE25-78; Appendix A). The purpose of the records search is to determine the extent of previous surveys within a 0.5-mile (800-meter) radius of the APE, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area. NEIC staff completed and returned the records search to ECORP on February 25, 2025.

In addition to the official records and maps for archaeological sites and surveys in Butte County, ECORP reviewed the following historic references: Built Environment Resource Directory (BERD) for Butte County (OHP 2023); Archaeological Resources Directory of Butte County (OHP 2022); the National Register Information System (National Park Service [NPS] 2022); OHP, California Historical Landmarks (CHL; OHP 2022); CHL (OHP 1996 and updates); California Points of Historical Interest (OHP 1992 and updates; California Department of Transportation (Caltrans) Local Bridge Survey ([Caltrans] 2019); Caltrans State Bridge Survey (Caltrans 2018); and *Historic Spots in California* (Kyle 2002).

Other references examined include a RealQuest Property Search and historic General Land Office (GLO) land patent records (Bureau of Land Management [BLM] 2022). ECORP reviewed the following maps:

- 1866 BLM GLO Plat Map for Township 22 North, Range 1 East, Mount Diablo Base and Meridian (MDBM)
- 1891 USGS Chico, California topographic quadrangle (1:125,000 scale)
- 1912 USGS Keefers, California topographic quadrangle (1:31,680 scale)
- 1944 USGS Richardson Springs, California topographic quadrangle (1:62,500 scale)
- 1951 USGS Richardson Springs, California topographic quadrangle (1:24,000 scale)
- 1951 (photorevised 1969) USGS Richardson Springs, California topographic quadrangle (1:24,000 scale)

ECORP reviewed aerial photographs from 1941, 1947, 1958, 1969, 1984, 1998, 2005, 2009, and every 2 years from 2010 to 2025 for any indications of APE usage and built environment.

ECORP conducted a search for a local historical registry, which revealed the City of Chico's Historic Resources Inventory.

4.3 Sacred Lands File Coordination Methods

In addition to the records search, ECORP contacted the California Native American Heritage Commission (NAHC) on February 20, 2025 to request a search of the Sacred Lands File for the APE. This search determines whether the California Native American tribes within the APE have recorded Sacred Lands, because the Sacred Lands File is populated by members of the Native American community with knowledge about the locations of tribal resources. In requesting a search of the Sacred Lands File, ECORP solicited information from the Native American community regarding TCRs, but the responsibility to formally consult with the Native American community lies exclusively with the federal and local agencies under applicable state and federal laws. The lead agencies do not delegate government-to-government authority to any private entity to conduct tribal consultation.

4.4 Other Interested Party Consultation Methods

ECORP contacted the Chico History Museum on February 20, 2025 to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area (Appendix A).

4.5 Field Methods

ECORP subjected the APE to an intensive pedestrian survey on March 18, 2025, under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983), using 15-meter transects (Figure 3). At the time, ECORP archaeologists examined the ground surface for indications of surface or subsurface cultural resources and inspected the general morphological characteristics of the ground surface for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the archaeologists examined the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances for artifacts or for indications of buried deposits. ECORP did not conduct any subsurface investigations or artifact collections during the pedestrian survey.

Standard professional practice requires that all cultural resources encountered during the survey be recorded using DPR 523-series forms approved by the California OHP. The resources are usually photographed, mapped using a handheld Global Positioning System receiver, and sketched as necessary to document their presence using appropriate DPR forms.

Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Cultural_Resources\CASRP Cultural.aprx - CASRP Survey Coverage 20250329 (bmarks - 4/23/2025)

Map Date: 4/18/2025

Sources: Esri, Maxar (2024)

Figure 3. Survey Coverage

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-138.02A Chico Airport Pond Sewer Repair Project

5.0 RESULTS

5.1 Records Search

The records search consisted of a review of previous research and literature, records on file with the NEIC for previously recorded resources, and aerial photographs and maps of the vicinity.

5.1.1 Previous Research

A total of three previous cultural resources investigations have been conducted within 0.5 mile of the APE, covering approximately 50 percent of the total records search area (Table 2). These studies, which were conducted between 1980 and 2019, revealed one historic resource associated with railroad infrastructure. One of the studies included portions of the APE: Jensen (1999).

Table 2. Previous Cultural Studies within 0.5 mile of the APE

Report No.	Author(s)	Report Title	Year	Included Portion of the APE?
3452	Peter M. Jensen	Archaeological Inventory Survey: Chico Municipal Airport, Master Plan Update and Area of Potential Effects for Proposed Improvements and Expansion of Existing Facilities	1999	Yes
9382	James P. Manning	Archaeological Reconnaissance of the Proposed Foothill Park Subdivision (Addition)	1980	No
14380	Ashleigh Sims, Robin Hoffman, and Katherine Cleveland	California Department of Water Resources Sacramento Yard and Sutter Yard 2019-2020 Channel Maintenance Areas: Archaeological Resources Inventory and Architectural Resources Inventory and Evaluation Report	2019	No
14380A	Katherine Cleveland and Ashleigh Sims	California Department of Water Resources Sacramento Yard and Sutter Yard 2019-2020 Channel Maintenance Areas: Archaeological Architectural Resources Inventory and Evaluation Report		

Note: APE = Area of Potential Effects

In 1999, Peter M. Jensen conducted an archaeological investigation for the Chico Municipal Airport Master Plan Update Project (Jensen 1999); this study encompassed the current APE and did not identify any historic-period resources adjacent to or within it. Jensen identified an isolated worked flake [redacted]

[redacted] Jensen did not record the isolate because, he reported, isolated finds are not significant resources as defined by Section 106 of NHPA, and no further treatment or consideration is warranted.

The results of the records search indicate that the entire APE has been previously surveyed for cultural resources; however, the study was conducted 26 years ago, is no longer current, and cannot be used to support current environmental review. ECORP, therefore, conducted a pedestrian survey of the APE for the Project under current protocols.

5.1.2 Previously Recorded Resources

The records search also determined that one previously recorded cultural resource was located within 0.5 mile of the APE. This historic-era resource is a segment of P-4-2770/CA-BUT-2770H (Sacramento Northern Railroad Spur Line) located less than 50 feet east of the APE. No previously recorded cultural resources are within the APE.

5.1.3 Records

The OHP's BERD for Butte County (dated September 23, 2023) did not reveal any resources within 0.5 mile of the APE (OHP 2020).

The National Register Information System (NPS 2022) did not reveal any listed properties within the APE. The nearest National Register listed property is the Bidwell Mansion, which is located approximately 3.5 miles south of the APE.

The OHP's Archaeological Resources Directory for Butte County did not reveal any resources within the APE; however, it lists one resource within 0.5 mile of the APE: P-4-2770/CA-BUT-2770H (Sacramento Northern Railroad Spur Line). This resource is located less than 50 feet east of the APE and was evaluated as not eligible for the NRHP through a consensus determination of a federal agency and SHPO (*6Y, 10/27/2009, EDA090805A* | *6Y, 11/18/2005, FHWA051017B*).

ECORP reviewed resources listed as CHLs by the OHP on February 19, 2025. The nearest listed landmark is CHL No. 329, Rancho Chico and Bidwell Adobe; the plaque is located 3.5 miles south of the APE (OHP 2022).

Historic Spots in California (Kyle 2002) mentions that Butte County was one of the original 27 counties in California. The word *Butte* derives from the word that early pioneers used to name high places, a mountain, and even ranges of mountains.

A RealQuest online property search for APNs 047-550-001 and 047-550-006 revealed 1,103.08 acres of land, which encompasses 12.53 acres of the APE, zoned for commercial use. Both properties are associated with Chico Regional Airport. No other APE history information was on record with RealQuest.

The Caltrans Bridge Local and State Inventories (Caltrans 2018, 2019) did not list any historic bridges within 0.5 mile of the APE.

The *Handbook of North American Indians* (Riddell 1978) describes the nearest Native American villages as being located [redacted]

ECORP reviewed the City of Chico's Historic Resources Inventory and did not identify historic resources located within 0.5 mile of the APE (Chico Heritage Association 1983).

5.1.4 Map Review and Aerial Photographs

The review of aerial photographs and maps of the APE provides information about the past land uses of the APE and the potential for buried archaeological sites. This information shows that the APE was initially undeveloped land until Chico's AAWTP infrastructure is first visible on a 1947 aerial photograph within the northern portion of the APE; however, it was constructed with the Army Air Field in 1942. The following is a summary of the review of maps and photographs:

- The 1866 BLM GLO Plat Map for Township 22 North, Range 1 East, MDBM does not depict any structures or development within the APE.
- The 1891 USGS Chico, California and 1912 USGS Keefers, California topographic quadrangles (1:125,000 and 1:31,680 scales) depict a northeast–southwest-oriented waterway labeled "Sheep's Hollow Creek" flowing southwestward and bisecting the southern portion of the APE. The maps depict Sheep's Hollow Creek and Grizzly Creek converging to the east of the APE and continuing to flow westward to Sycamore Creek. The maps also depict a north–south-oriented road that corresponds with the present-day road alignment of Cohasset Road to the east of the APE.
- An aerial photograph from 1941 shows a north–south-oriented road that corresponds with Cohasset Road to the east of the APE. The photograph shows Sheep's Hollow Creek meandering in a northeast–southwest direction through the APE, in addition to what appears to be overflowed land within the southern portion of the APE.
- The 1944 USGS Richardson Springs, California topographic quadrangle (1:62,500 scale) depicts the northernmost portion of the APE within the southern boundary of the Chico Army Flying School. The map also depicts the Sacramento Northern Railway as oriented in a north–south direction to the east of the APE and parallel to Cohasset Road to the west. The map does not depict any structures or developments within the APE.
- Aerial photographs from 1947 and 1958 show Chico AAWTP situated in the northern portion of the APE, as evidenced by wastewater infrastructure, including a lagoon. The photographs show the southern portion of the APE within an agricultural field, as evidenced by furrows created by farm equipment. A photograph from 1958 shows one dirt road on the western side of the Chico AAWTP and one dirt road that follows the contour of the southern levee.
- The 1951 USGS Richardson Springs, California topographic quadrangle (1:24,000 scale) depicts the Chico Municipal Airport to the north of the APE. The map depicts three structures and a water-retention basin, which is likely the wastewater infrastructure and lagoon associated with

Chico Army Airfield, located in the northernmost portion of the APE. The map depicts an east–west-oriented channel that flows eastward from the lagoon into Sheep's Hollow Creek.

- The 1969 photorevised edition of the 1951 USGS Richardson Springs, California topographic quadrangle (1:24,000 scale) depicts a levee oriented along the southern bank of Sheep's Hollow Creek. The map shows a second levee along the northern bank that extends eastward to the western edge of the APE.
- Aerial photographs from 1969, 1973, and 1984 do not show any changes to the APE compared to the 1969 photorevised edition of the 1951 topographic quadrangle. The photographs show the Chico AAWTP infrastructure within the northern portion of the APE.
- An aerial photograph from 1998 shows that the lagoon has been separated into two water-retention basins by what appears to be an earthen berm. The photograph also shows rows of what appear to be soil piles immediately north of the APE, which correspond with the location of the present-day composting facility outside of the APE.
- Aerial photographs from 2005, 2009, and every 2 years from 2010 to 2022 show the APE in its present-day state.

The map study revealed that the Project Area has been on the southern end of an airfield and part of a wastewater treatment plant since the early 1940s. Since that time, the area has undergone very little change beyond the channelization of creek to the south.

5.2 Sacred Lands File Results

A search of the Sacred Lands File by the NAHC did not reveal the presence of Native American cultural resources within the APE. Appendix B provides a record of all correspondence to date.

5.3 Other Interested Party Consultation Results

ECORP has not received any responses from the Chico History Museum as of the date of this document.

5.4 Field Survey Results

ECORP surveyed the APE for cultural resources on March 18, 2025. The APE is situated on property owned by the City within the former Chico AAWTP and the City's existing composting facility. The APE comprises a mostly undeveloped lot covered with short grass and weeds in addition to impervious surfaces such as gravel access roads. The ground surface visibility at the time of the survey was nearly 100 percent in exposed soil areas and 40 percent in densely vegetation areas.

ECORP observed two built environment resources: CA-01 (Chico-Mud Creek - Unit 3 East Sycamore RT Levee System) and CA-02 (Chico AAWTP). The levee system that composes CA-01 first appeared in an aerial photograph and topographic map from 1969. The Chico AAWTP infrastructure that composes CA-02—including two clarifiers, two trickling filters, one lagoon, and one control building—which was built between 1942 and 1945 according to archival research. Both built environment resources meet the 50-

year-old threshold and are discussed further in Sections 5.4.1.1 and 5.4.1.2. ECORP did not observe any pre-contact resources during the survey.

Figure 4. APE Overview (view south; March 18, 2025).

Figure 5. APE Overview (view northeast; March 18, 2025).

5.4.1 Cultural Resources

As a result of previous investigations by other firms, there were no previously recorded resources within the APE. During the 2025 field survey, ECORP identified two newly built environment resources within the APE: CA-01 (Chico-Mud Creek - Unit 3 East Sycamore RT Levee System) and CA-02 (Chico AAWTP).

The following sections provide site descriptions, and Appendix D provides the confidential DPR site records.

5.4.1.1 CA-01 (Chico-Mud Creek - Unit 3 East Sycamore RT Levee System)

Resource CA-01 consists of the Chico-Mud Creek-Unit 3 East Sycamore RT Levee System, which is a portion of the Chico and Mud Creeks and Sandy Gulch Levee Improvement Project constructed by USACE. Two levees of this system bisect the southern portion of the APE: one on the northern bank of Sheep's Hollow Creek and one on the southern bank.

The southern levee is an approximately 2-mile-long flood-control levee constructed by the USACE Sacramento District in 1965 to help control flooding within the City of Chico. The levee is roughly horseshoe-shaped. On the northern end the levee begins on the western side of Cohasset Road, follows the southern bank of Sheep's Hollow Creek downstream (southwest) to its mouth, turns eastward to follow Sycamore Creek upstream along the north bank of Sycamore Creek, then ends at Cohasset Road. The levee features a one-lane gravel road on top and measures approximately 30 feet wide by 6 to 10 feet high.

The northern levee parallels the northern bank of Sycamore Creek from its intersection with Cohasset Road southwestward, to the southwest of the APE. A gravel road is situated on top of the levee.

Figure 6. Overview of CA-01 (view south; March 18, 2025).

<u>Evaluation of CA-01 (Chico-Mud Creek-Unit 3 East Sycamore RT Levee System)</u>

ECORP evaluated the entirety of CA-01. This resource is an element of the Chico-Mud Creek- Unit 3 East Sycamore RT Levee System, which is included in the larger Chico and Mud Creeks and Sandy Gulch Levee Improvement Project. The levee is, therefore, associated with flood control in the City of Chico. As one of multiple levee projects constructed by USACE in the mid-20th century, CA-01 did not, on its own, shape patterns of development in Butte County. Resource CA-01 is not associated with events that have made a significant contribution to the broad patterns of Butte County's history; therefore, it is not eligible for the NRHP/CRHR under Criterion A/1.

Archival research reveals that CA-01 has no significant association with an important person who contributed to local, state, or national history or to the history of the APE itself. Generations of unidentifiable construction workers have helped to maintain the levee, and the archival record failed to identify any historically significant individuals or groups of people associated with the levee. Resource CA-01 has no association with the lives of persons significant in the past; therefore, it is not eligible for the NRHP/CRHR under Criterion B/2.

The original section of CA-01 was built in 1965, and the techniques used for the construction and maintenance of the levee are not unique and were in existence prior; therefore, the levee is not historically significant. Resource CA-01 does not have any distinctive characteristics, form, or materials. It does not embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possesses high artistic values, or have any significant distinguishable components; therefore, it is not eligible for the NRHP/CRHR under Criterion C/3.

The information potential for CA-01 is expressed in its built form and the historical record. This resource has not yielded, nor is it likely to yield, information important in history or prehistory; therefore, it is not eligible for the NRHP/CRHR under Criterion D/4.

Integrity

The National Park Service identifies seven aspects of integrity that indicate a resource's ability to convey significance achieved during a period of significance: location, association, setting, design, material, workmanship, and feeling. Resource CA-01 was built in 1965 and has been regularly repaired and maintained. The levee has retained its original location, setting, feeling, and association as a mid-20th-century flood control system; however, the design, workmanship, and material have been substantially altered by ongoing maintenance and repair activities.

Regardless of historical significance, CA-01 does not meet NRHP/CRHR eligibility criteria as individual resources or as part of any known or suspected historic district; this resource is not listed on any Certified Local Government historic property register.

5.4.1.2 CA-02 (Chico Army Airfield Wastewater Treatment Plant)

Resource CA-02 consists of the remnants of the former Chico AAWTP (Figure 7). This resource is situated on the southern end of the Chico Regional Airport and to the south of the City's active composting facility within the northern of the APE. Resource CA-02 first appeared in an aerial photograph from 1947; however, archival research suggests that the built date was between 1942 and 1945. ECORP observed six features associated with the resource, as described below.

Figure 7. Overview of CA-02 (view northeast; March 18, 2025).

Features A and B

Features A and B consist of the remains of two clarifiers (Figure 8). The tops of both features were visible from the ground surface. They consist of a circular concrete basin filled with crushed granite rocks. These features contained a horizontal platform that stems from the center of the basin and extends eastwards. This platform would have used a mechanical skimmer and rake system for the primary stage of wastewater treatment.

Figure 8. Overview of CA-02, Features A and B (view southwest; March 18, 2025).

Features C and D

Features C and D consist of the remains of two trickling filters (Figure 9). Both features consist of circular concrete basins filled with crushed granite rocks. Each feature contains a rotating arm that would have been used to spray wastewater over the rocks to begin the secondary stage of wastewater treatment.

Figure 9. Overview of CA-02, Features C and D (view northeast; March 18, 2025)

Feature E

Feature E consists of a lagoon (Figure 10). It comprises a shallow, earthen pond separated by a gravel berm oriented in a north-south direction. The lagoon was partially filled with water, and the banks show evidence of natural erosion.

Figure 10. CA-02, Feature E overview (view east; March 18, 2025).

Feature F

Feature F consists of the remains of Chico AAWTP's control building (Figure 11). The collapsed building contained exposed decomposing wood, metal, and appeared deteriorated.

Figure 11. Overview of CA-02, Feature F (view northwest; March 18, 2025).

Evaluation of CA-02 (Chico Army Airfield Wastewater Treatment Plant)

Although CA-02 (Chico AAWTP) is within the boundaries of the Chico Regional Airport, an evaluation of the airport itself is beyond the scope of this investigation; therefore, ECORP evaluated only the Chico AAWTP with a period of significance of 1942 to 1947.

USACE and the City constructed the Chico AAWTP to support the adjacent pilot training facility during World War II. Resource CA-02, however, did not, on its own, contribute significantly to the war effort or the broad patterns of history on the local, state, or national level; therefore, it is not eligible for NRHP/CRHR under Criterion A/1.

Countless military and civilian technicians and personnel built and maintained the Chico AAWTP; however, there is nothing in the archival record to suggest that CA-02 is associated with the lives of persons significant in the past; therefore, it is not eligible for the NRHP/CRHR under Criterion B/2.

As a small wastewater treatment plant that is indistinguishable from other similar facilities throughout the world, CA-02 (Chico AAWTP) does not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; therefore, it is not eligible for the NRHP/CRHR under Criterion C/3.

Wastewater treatment plants such as the Chico AAWTP do not typically contain buried resources. The information potential of the Chico AAWTP is expressed in its built form and through the historical record.

Resource CA-02 (Chico AAWTP) has not yielded, nor is it likely to yield, information important in history or pre-history; therefore, it is not eligible for the NRHP/CRHR under Criterion D/4.

Integrity

The National Park Service identifies seven aspects of integrity that indicate a resource's ability to convey significance achieved during a period of significance: location, association, setting, design, material, workmanship, and feeling. Resource CA-02 (Chico AAWTP) retains integrity of location and materials but lacks integrity of design, workmanship, feeling, setting, and association. The treatment plant remains in its original location, in largely the same layout and with most of the original structures intact. However, the land surrounding the AAWTP and Chico Regional Airport has changed significantly since the plant's period of significance of 1942 to 1947 because the City of Chico has urbanized and expanded, thereby diminishing the resource's integrity of feeling and setting. Additionally, CA-02 (Chico AAWTP) was decommissioned in the late 1960s and is no longer associated with its function as a wastewater treatment plant, thereby diminishing its integrity of association, feeling, and design. T

Regardless, due to a lack of historical significance, CA-02 (Chico AAWTP) does not meet NRHP or CRHR eligibility criteria. The resource is not known to be part of any known or suspected historic district, and it is not listed on any Certified Local Government historic property register.

6.0 MANAGEMENT CONSIDERATIONS

6.1 Conclusions

ECORP identified two built environment resources within the APE: CA-01 (Chico-Mud Creek-Unit 3 East Sycamore RT Levee System) and CA-02 (Chico AAWTP). ECORP evaluated both resources and recommends that neither are eligible for the NRHP/CRHR under any criteria; therefore, no known Historic Properties as defined by Section 106 of the NHPA or Historical Resources as defined by CEQA will be affected by the Proposed Project. The proposed Project will have No Effect/No Impact on these resources. Until the Lead Agencies concur with the identification and evaluation of eligibility of cultural resources, no Project activity should occur.

6.2 Likelihood for Subsurface Cultural Resources

Before the existing development within the APE, the APE was considered to have a *moderate* potential for buried archaeological deposits because the underlying geology contains alluvium deposits, which tend to preserve archaeological material when waterways flood and overflow their banks, creating an increased likelihood for pre-contact archaeological resources to be located along perennial waterways. Several factors, however, reduce the potential to *low*. The construction of Chico AAWTP and Chico-Mud Creek-Unit 3 East Sycamore RT Levee System would have disturbed the upper portion of the soil, and the lack of pre-contact resources documented within 0.5 mile of the APE suggests a lower overall potential for buried pre-contact resources; therefore, the potential for intact, buried pre-contact resources within the APE is *low*.

The APE has a *low* potential for buried historic-era deposits. The structures and buildings associated with a wastewater treatment plant are not likely to have buried deposits, and any refuse would have been removed off site.

6.3 Recommendations

6.3.1 Post-Review Discoveries

There always remains the potential for ground-disturbing activities to expose previously unrecorded cultural resources. Both CEQA and Section 106 of the NHPA require the lead agency to address any unanticipated cultural resource discoveries during Project construction. Therefore, ECORP recommends the following procedures.

- If non-human bones, pottery fragments, or other potential cultural resources are unearthed during construction, the Contractor shall immediately cease work within 25 feet of the resources and notify City of Chico Public Works Engineering at (530) 879-6900. The supervising contractor shall be responsible for reporting any such findings to the Engineer. No work may occur within the 25-foot buffer until a qualified archaeologist has conducted onsite meetings with the Contractor and determined mitigation measures.
- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the lead agencies. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be a Historical Resource under CEQA, as defined by CEQA or a historic property under Section 106 NHPA, if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.
- If the find includes human remains, or remains that are potentially human, the Contractor shall immediately cease work within 100 feet of the remains and notify City of Chico Public Works Engineering at (530) 879-6900, pursuant to Health and Safety Code 7050.5. The supervising contractor shall be responsible for reporting any such findings to the Engineer. No work may occur within the 100-foot buffer until the City has made the necessary findings as to the origins and dispositions of the remains pursuant to the Public Resources Code 5097.98., As part of this process, the Butte County Coroner shall be notified (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California PRC, and AB 2641 will be implemented. If the coroner determines the remains are Native American and not the result of a crime scene, the coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the

recommendations of the MLD, the NAHC can mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

7.0 REFERENCES CITED

Baumhoff, M.A. and D.L. Olmsted. 1963. Palaihnihan: Radiocarbon Support for Glottochronology. *American Anthropologist* 65(2):278-284.

Beardsley, R. K. 1954. *Temporal and Areal Relationships in Central California Archaeology, Parts I & II.* University of California Archaeological Survey Reports, Nos. 24 & 25, Berkeley.

_____. 1948. Cultural Sequences in Central California Archaeology. *American Antiquity* 14:1-28.

Bennyhoff, James A. 1994. Central California Augustine: Implications for Northern California Archaeology. In *Towards a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson*, edited by R.E. Hughes, pp. 65-74. Contributions of the University of California Archaeological Research Facility 52, Berkeley.

_____. 1950. California Fish Spears and Harpoons. *University of California Anthropological Records* 9:295-338.

Bennyhoff, James A. and D. Fredrickson. 1994. A Proposed Integrative Taxonomic System for Central California Archaeology. In *Towards a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson*, edited by R.E. Hughes, pp. 15-24. Contributions of the University of California Archaeological Research Facility 52, Berkeley.

Britannica 2018. John Bidwell, American Politician. Encyclopedia Britannica. https://www.britannica.com/biography/John-Bidwell.

_______. 2011. Chico, California. Encyclopedia Britannica. https://www.britannica.com/place/Chico-California.

Bureau of Land Management (BLM). 2022. Bureau of Land Management, General Land Office Records, Records Automation website. http://www.glorecords.blm.gov/, accessed February 19, 2025.

California Department of Transportation (Caltrans). 2019. *Structure and Maintenance & Investigations, Historical Significance–Local Agency Bridges Database March 2019*. https://dot.ca.gov/-/media/dot-media/programs/maintenance/documents/f0009165-hs-local-a11y.pdf, accessed February 19, 2025.

_____. 2018. Structure and Maintenance & Investigations, Historical Significance–State Agency Bridges Database September 2018. http://www.dot.ca.gov/hq/structur/strmaint/hs_state.pdf, accessed February 19, 2025.

California State Water Boards. 2025. Water Words-Glossary and Definitions: A Compilation of Technical Water, Water Quality, Environmental, and Water-Related Terms. https://www.waterboards.ca.gov/publications_forms/available_documents/water_words.html. Accessed March 27, 2025.

Chico Heritage Association. 1983. The City of Chico's Historical Resources Inventory. https://chico.ca.us/documents/Government/Boards--Commissions/Architectural-Review-and-

Historic-Preservation-Board/Historic-Resources-Inventory/IntroductionAndBackgroundInformation.pdf. Accessed February 19, 2025.

Chico Redevelopment Agency. 2004. Amended and Restated Redevelopment Plan for the Chico Municipal Airport Redevelopment Project. Prepared for Chico City Council. https://web.archive.org/web/20070103092903/http://www.chico.ca.us/econdev/Chico_Municipal_Airport_RDA_Plan.pdf. Accessed on March 27, 2025.

Crawford, Jeff and Jessica Herrick. 2006. Intelligent Engineering: William Hammond Hall and the State Engineering Department. *Sacramento History Journal* 6(1–4).

Dixon, R. B. 1905. The Northern Maidu. *Bulletin of the Museum of Natural History* 17(3):119-346. New York.

Erlandson, J. M. 1994. *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.

Fredrickson, David A. 1994. Spatial and Cultural Units in Central California Archaeology. In *Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson*, edited by R.E. Hughes, pp. 25-48. Contributions to the University of California Archaeological Research Facility no. 52.

_____. 1974. Cultural Diversity in Early Central California: A view from the North Coast Ranges, *Journal of California Anthropology* 1:41-54.

_____. 1973. Early Cultures of the North Coast and North Coast Ranges, California. PhD Dissertation, Department of Anthropology, University of California, Davis.

_____. 1968. Archaeological Investigations at CCO-30 near Alamo, Contra Costa County, California. Center for Archaeological Research at Davis Publication no. 1. University of California, Davis.

Heizer, Robert F. 1978. Handbook of North American Indians: California 8. Key to Tribal Territories, pp. ix. Smithsonian, Washington.

_____. 1949. The Archaeology of Central California, I: The Early Horizon. *University Of California Anthropological Records* 12(1):1-84. Berkeley, California.

Hill, D. J. 1970. *Indians of Chico Rancheria: An Ethnohistoric Study*. Unpublished M.A. Thesis in Anthropology, California State College, Chico.

Hull, Kathleen 2007. The Sierra Nevada: Archaeology in the Range of Light. In *California Prehistory: Colonization, Culture, and Complexity*. edited by T. Jones and K. Klar, pp. 177-190. Altamira Press, Lanham, Maryland.

Johnson, Jerald J. 1970. Archaeological Investigations at the Applegate Site (4-Ama-56). *University of California, Center for Archaeological Research at Davis, Publications* 2:65-144.

Johnson, J. J. and D. J. Theodoratus. 1978. *Cultural Resources of the Marysville Lake, California Project (Parks Bar Site), Yuba and Nevada Counties, California*. Prepared for U.S. Army Corps of Engineers, Sacramento.

_____. 1967. *The Archaeology of the Camanche Reservoir Locality, California.* Sacramento Archaeological Society Papers No. 6. Sacramento, California.

JRP Historical Consulting, LLC (JRP) and AECOM. 2023. *California Drinking Water and Wastewater Treatment Facilities Historic Context*. Prepared by JRP and AECOM for the State Water Resources Control Board.

Kowta, M. 1988. *The Archaeology and Prehistory of Plumas and Butte Counties, California: An Introduction and Interpretive Model*. Report on file, North Central Information Center, Department of Anthropology, California State University, Sacramento.

_____. 1925. *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Washington.

Küchler, A. W. 1977. *The Map of the Natural Vegetation of California*. University of Kansas, Lawrence.

Kyle, Douglas. 2002. *Historic Spots in California*. Stanford University Press. Stanford, California.

Lillard, J. B., R. F. Heizer, and F. Fenenga. 1939. *An Introduction to the Archaeology of Central California*. Sacramento Junior College, Department of Anthropology Bulletins, No. 2, Sacramento.

McCawley, William. 1996. *The First Angelinos: the Gabrielino Indians of Los Angeles*. Malki Museum Press, Ballena Press, Banning, California.

McGowan, J. A. 1961. *History of the Sacramento Valley*. New York: Lewis Historical Publishing Company

McHenry, H. 1968. Transverse Lines in Long Bones of Pre-contact California Indians. *American Journal of Physical Anthropology* 29 (1): 1-18.

Meyer, Jack and Jeffrey S. Rosenthal. 2008. *A Geoarchaeological Overview and Assessment of Caltrans District 3: Cultural Resources Inventory of Caltrans District 3 Rural Conventional Highways, Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba Counties*. Prepared for Caltrans District 3.

_____. 1997. *Archaeological and Geoarchaeological Investigations at Eight Prehistoric Sites in the Los Vaqueros Reservoir Area, Contra Costa County, California*. Anthropological Studies Center, Sonoma State University Academic Foundation, Rohnert Park, California. Submitted to the Contra Costa County Water District, Concord, California. Copies available at the Northwest Information center, Sonoma State University, Rohnert Park.

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

National Park Service (NPS). 2022. National Register of Historic Places, Digital Archive on NPGallery https://npgallery.nps.gov/NRHP/. accessed February 19, 2025.

_____. 1983. Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. 48 FR (Federal Register) 44716-68.

Natural Resources Conservation Service (NRCS). 2025. Natural Resources Conservation Service Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed February 18, 2025.

Office of Historic Preservation (OHP). 2023. Office of Historic Preservation's Built Environment Resource Directory (BERD), dated September 23, 2023 for Butte County. On file at NEIC, California State University, Chico, California.

_____. 2022. *Office of Historic Preservation California Historical Landmarks Website*. http://ohp.parks.ca.gov/?page_id=21387. Accessed February 19, 2025.

_____. 1996. California Historical Landmarks. California Department of Parks and Recreation, Sacramento, California.

_____. 1992. California Points of Historical Interest. California Department of Parks and Recreation, Sacramento, California.

O'Neill, K. M. 2006. *Rivers by Design: State Powers and the Origins of U.S. Flood Control*. Durham, NC: Duke University Press.

Powers, S. 1877. *Tribes of California*. Contributions to North American Ethnology 3. U.S. Geographical and Geological Survey of the Rocky Mountain Region. Washington.

Ragir, S. 1972. *The Early Horizon in Central California Prehistory*. Contributions of the University of California Archaeological Research Facility 15. Berkeley.

Riddell, F. A. 1978. Maidu and Konkow. *Handbook of North American Indians: California* 8:370-386. Smithsonian Institution, Washington.

Riddell, F. A. and W. E. Pritchard. 1971. *Archaeology of the Rainbow Point Site (4-PLU-S94), Bucks Lake, Plumas County, California*. University of Oregon Anthropological Papers 1:59-102. Eugene.

Robertson, Donald B. 1998. *Encyclopedia of Western Railroad History, Volume IV, California*. Caldwell, Idaho: The Caxton Printers.

Robinson, W. W. 1948. *Land in California: The Story of Mission Lands, Ranchos, Squatters, Mining Claims, Railroad Grants, Land Scrip, Homesteads*. University of California Press, Berkeley.

Rondeau, M.F. 1980. *The Archaeology of the Salmon Creek Site, Sierra County, California*. Submitted to Tahoe National Forest, Nevada City, California.

Rosenthal, J, and K. McGuire. 2004. *Middle Holocene Adaptations in the Central Sierra Nevada Foothills: Data Recovery Excavations at the Black Creek Site CA-CAL-789*. Far Western Anthropological Research Group, Davis. Copies available from Central California Information Center, Department of Anthropology, California State University, Stanislaus, Turlock.

Rosenthal, J., White, G., and Mark Sutton. 2007. The Central Valley: A View from the Catbird's Seat. In *California Prehistory: Colonization, Culture, and Complexity,* edited by T. Jones and K. Klar, pp. 147-163. Altamira Press, Lanham, Maryland.

Rosenthal, Jeffrey and Sam Willis. 2017. Geoarchaeological Investigation for the Sutter Basin Flood Risk Management Project, Cypress Avenue to Tudor Road, Feather River West Levee, Sutter County, California. DRAFT.

Ruhge, Justin. 2017. History. Historic California Posts: Chico Army Air Field, accessed April 24, 2025.

Schulz, Peter. 1970. Report of site and burial. *Society for California Archaeology Newsletter* 4(2&3):23-24. On file, Department of Anthropology Museum, University of California Davis, California.

Shaw, Samuel P. and C. Gordon Fredine. 1956. Wetlands of the United States–Their Extent and Their Value to Waterfowl and Other Wildlife. U.S. Department of the Interior, Washington, D.C. Circular 39. Northern Prairie Wildlife Research Center Online. Available: http://www.npwrc.usgs.gov/resource/wetlands/uswetlan/index.htm. (Version 05JAN99). Accessed: March 17, 2025.

Stine, S. 1994. Extreme and Persistent Drought in California and Patagonia During Mediaeval Times. *Nature* 369:546-549.

Sundahl, E.M. 1992. Cultural Patterns and Chronology in the Northern Sacramento River Drainage. In *Proceedings of the Society for California Archaeology 5*, edited by M.D. Rosen, L.E. Christiansen, and D. Laylander, pp. 89-112. Society for California Archaeology, San Diego.

_____. 1982. The Shasta Complex in the Redding Area, California. Master's Thesis, Department of Anthropology, California State University, Chico.

Thompson, T.H. and A.A. West. 1880. *History of Sacramento County*. Reproduced by Howell-North, 1960, Berkeley.

U.S. Army Corps of Engineers (USACE) National Levee Database. 2025. Website, https://levees.sec.usace.army.mil/search, accessed on March 20, 2025.

Wallace, William J. 1978. Post-Pleistocene Archeology, 9000 to 2000 BC. In *Handbook of North American Indians, Vol. 8: California*, edited by R.F. Heizer, pp. 25-36. Smithsonian Institution, Washington, D.C.

Wohlgemuth, Eric. 2004. The Course of Plant Food Intensification in Native Central California. Ph.D. Dissertation, Department of Anthropology, University of California, Davis.

_____. 1984. *Archaeological Investigations at CA-PLA-500, the Sailor Flat Site, Placer County, California. Tahoe National Forest Cultural Resources Report 16*. Tahoe National Forest, Nevada City, California.

LIST OF APPENDICES

APPENDIX A

Records Search Confirmation and Historical Society Coordination

California Historical Resources
Information System

BUTTE
GLENN
LASSEN
MODOC
PLUMAS
SHASTA

SIERRA
SISKIYOU
SUTTER
TEHAMA
TRINITY

Northeast Information Center
1074 East Avenue, Suite F
Chico, California 95926
Phone (530) 898-6256
neinfocntr@csuchico.edu

February 25, 2025

Erica Ramirez-Schroeder
ECORP Consulting, Inc.
2525 Warren Drive
Rocklin, CA 95677

IC File # NE25-78
Data Request - Standard

RE: Chico Airport Pond Sewer Repair Project (2024-080)
T22N, R01E, Section 3 MDBM
USGS Richardson Springs 7.5’ (1969) & Richardson Springs 15’ (1944) quadrangle maps
Approximately 11.57 acres (Butte County)

Erica Ramirez-Schroeder:

In response to your request, a records search for the project cited above was conducted by examining the official maps and records for cultural resources and reports in Butte County. Please note, the search includes the requested ½-mile radius surrounding the project area.

RESULTS:

Resources within project area:	None listed
Resources within ½-mile radius:	P-04-002770
Reports within project area:	NEIC-003452
Reports within ½-mile radius:	NEIC-009382, NEIC-014380

As indicated on your data request form, the locations of resources and reports are provided in the following format: ☒ Custom Maps ☒ GIS Data ☐ N/A

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Other Reports: *	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Built Environment Resources Directory:	☐ enclosed	☒ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☒ enclosed	☐ not requested	☐ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☐ not requested	☒ nothing listed
Caltrans Bridge Survey:	☐ enclosed	☒ not requested	☐ nothing listed
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☐ not requested	☒ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Shipwreck Inventory:	☐ enclosed	☒ not requested	☐ nothing listed

Notes: ***These are classified as studies that are missing maps or do not have a field work component.

Please refer to the NRCS Soil Survey website for current soil survey information:

https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if it is for public distribution.

The provision of California Historical Resources Information System (CHRIS) Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archaeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation (OHP), or the State Historical Resources Commission.

Not all known cultural resources have been recorded and submitted to the OHP, so this record search should not be considered an exhaustive list of all cultural resources present in your project area. DPR forms and reports that are used for recording and evaluating sites and individual resources are submitted to the Northeast Information Center by private and public agencies. Please note that the Northeast Information Center is not responsible for misinformation of coordinates presented on the submitted DPR forms. If a discrepancy is found, please contact the lead agency for more information.

Due to processing delays and other factors, it is possible that not all reports and resource records that have been submitted to the OHP are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for cultural resource management work in the search area. Additionally, Native American tribes have cultural resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

An invoice will follow from Chico State Enterprises for billing purposes. Thank you for your concern in preserving California's cultural heritage, and please feel free to contact us if you have any questions or need any further information.

Sincerely,

Casey Hegel

Casey Hegel, M.A.
Senior Research Associate
Northeast Information Center
(530) 898-6256

CHRIS Data Request Charge for IC File # NE25-78

The charge for this records search is **$206.30**. Please see the table below for an itemization.

THIS IS NOT AN INVOICE *		
Factor	**Charge**	**Your Charge**
Information Center Time	$150.00 per hour	$150.00 (1 hour)
GIS Data	$12.00 per shape	$48.00 (4 shapes)
Digital Database Records	$0.25 per row	$1.25 (5 rows)
Copies	$0.15 per copy	$7.05 (47 copies)
Total Charge		**$206.30**

*An invoice will follow from Chico State Enterprises for billing purposes.

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
NEIC-003452	IC Record Search Nbr - D93-58	1999	Peter M. Jensen	Archaeological Inventory Survey: Chico Municipal Airport, Master Plan Update and Area of Potential Effects for Proposed Improvements and Expansion of Existing Facilities	Jensen & Associates	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
NEIC-009382	Voided - B-L-143	1980	James P. Manning	Archaeological Reconnaissance of the Proposed Foothill Park Subdivision (Addition).	Society for California Archaeology	
NEIC-014380		2019	Ashleigh Sims, Robin Hoffman, and Katherine Cleveland	California Department of Water Resources Sacramento Yard and Sutter Yard 2019-2020 Channel Maintenance Areas: Archaeological Resources Inventory and Architectural Resources Inventory and Evaluation Report	Environmental Science Associates	04-001281, 04-001410, 04-001411, 04-002770, 04-003121, 04-004594, 11-000745, 51-000087, 51-000365, 51-000366, 51-000367
NEIC-014380		2019	Katherine Cleveland and Ashleigh Sims	California Department of Water Resources Sacramento Yard and Sutter Yard 2019-2020 Channel Maintenance Areas: Archaeological Architectural Resources Inventory and Evaluation Report	Environmental Science Associates	

Outlook

Cultural Resources Identification Efforts: Chico History Museum

From Erica Ramirez <eramirez@ecorpconsulting.com>
Date Thu 2/20/2025 4:00 PM
To info@chicohistorymuseum.org <info@chicohistorymuseum.org>

1 attachment (1 MB)
Chico History Museum Letter.pdf;

Dear Chico History Museum,

I've attached a letter and map regarding the cultural resources study for the Chico Airport Sewer Pond Repair Project in Butte County, California.

We are seeking information from parties that may have knowledge or concerns about possible cultural resources within or adjacent to the Project Area.

Feel free to reach out if you have questions and thank you for your time

Best,
Erica J. Ramirez-Schroeder, M.A., RPA (She/her)
Associate Archaeologist
ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
California Small Business for Public Works (SB-PW)

Rocklin Headquarters Office
2525 Warren Drive, Rocklin, California 95677
Ph: 916.782.9100 ◆ Cell: 916.824.5147
eramirez@ecorpconsulting.com www.ecorpconsulting.com
◆Rocklin ◆ Redlands ◆ Irvine ◆ San Diego ◆ Chico ◆ Santa Fe, NM

February 20, 2025

Chico History Museum
P.O. Box 6988
Chico, California 95927
Sent via email at info@chicohistorymuseum.org

RE: Cultural Resources Identification Effort for the* Chico Airport Sewer Pond Repair *Project, Butte County, California (ECORP Project No. 2024-080)

Dear Chico History Museum,

ECORP Consulting, Inc. has been retained to assist in the planning of the development of the project indicated above. As part of the identification effort, we are seeking information from all parties that may have knowledge of or concerns with historic properties or cultural resources in the area of potential effect.

Included is a map showing the Project Area outlined. We would appreciate input on this undertaking from the historical society with concerns about possible cultural properties or potential impacts within or adjacent to the area of potential effect. If you have any questions, please contact me at (916) 782-9100 or eramirez@ecorpconsulting.com.

Thank you in advance for your assistance in our cultural resource management study.

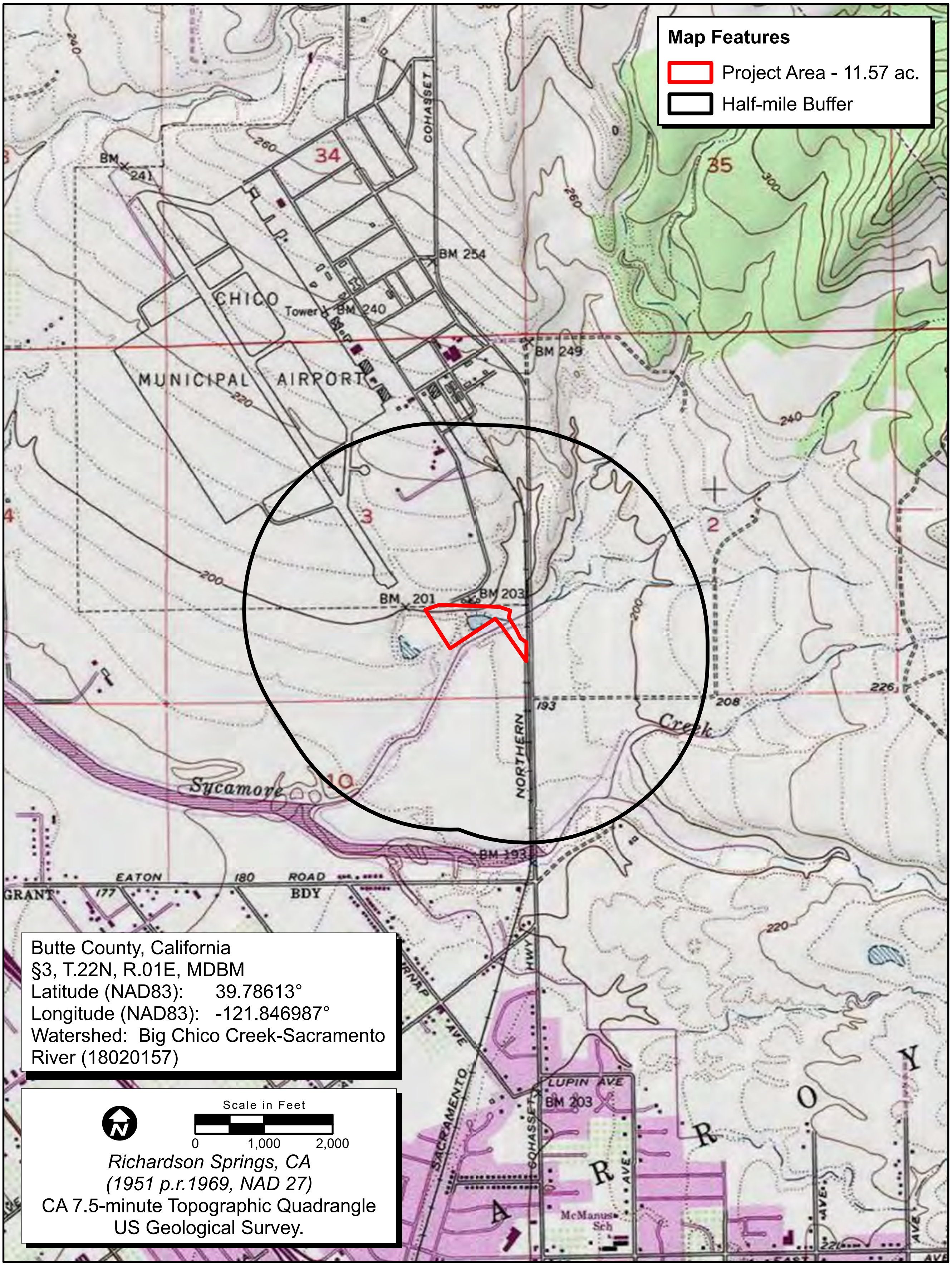
Sincerely,

Erica Ramirez-Schroeder

Erica Ramirez-Schroeder, M.A., RPA
Associate Archaeologist

Attachment:
Project Location Map

Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Cultural_Resources\CASRP Cultural.aprx - CASRP Records Search 20250218 (lgalvez - 2/18/2025)



Map Date: 2/18/2025

Sources: ESRI, USGS

Records Search

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-080 Chico Airport Sewer Pond Repair Project

APPENDIX B

Sacred Lands File Coordination

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Chico Airport Pond Sewer Repair Project (2024-080)

County: Butte

USGS Quadrangle Name: 1951 (PR 1969) Richardson Springs, CA

Township:22 North **Range:**1 East **Section:** 3

Company/Firm/Agency: ECORP Consulting, Inc.

Contact Person: Erica Ramirez-Schroeder

Street Address: 2525 Warren Drive

City: Rocklin **Zip:** 95677

Phone: 916-782-9100

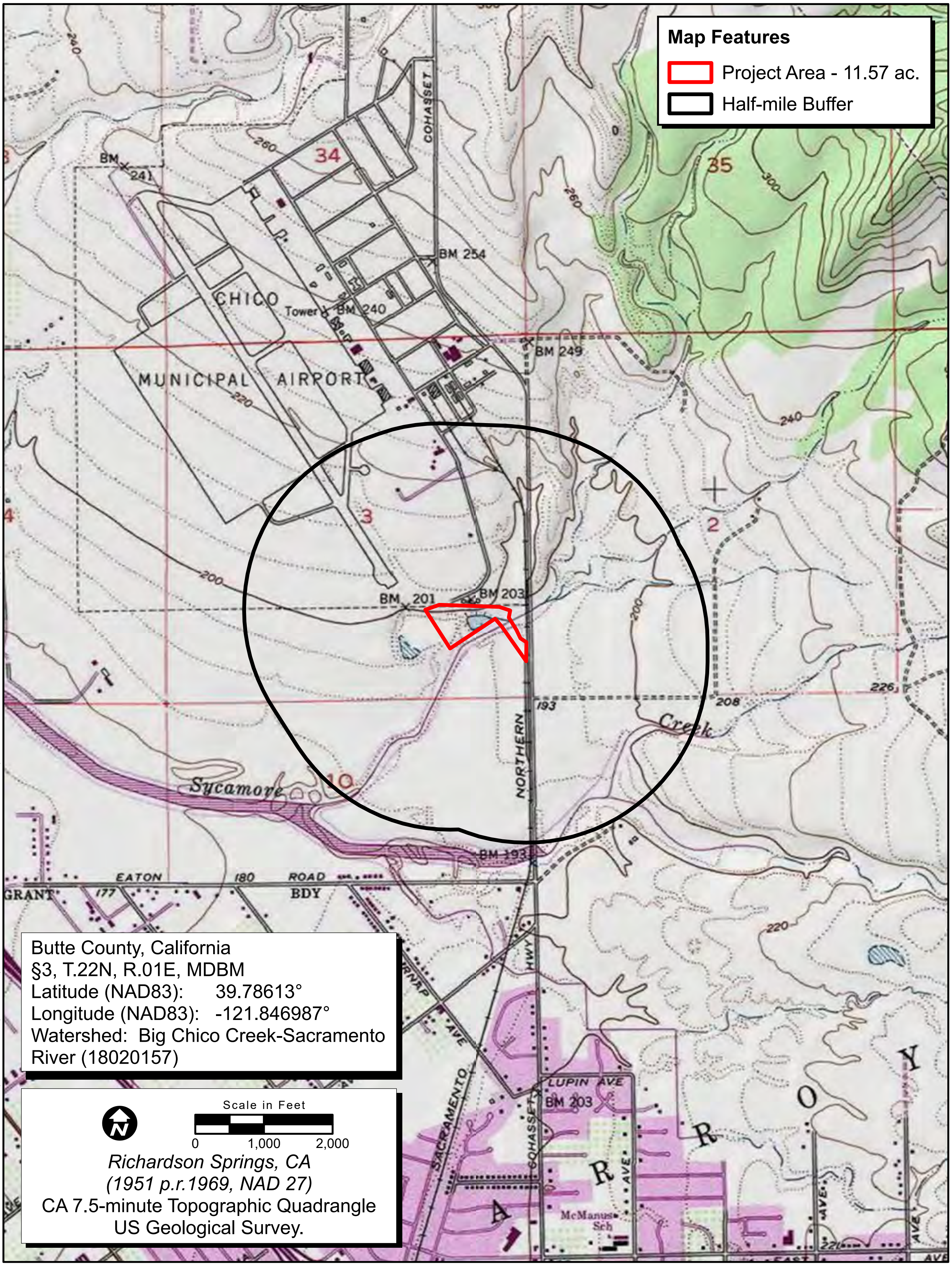
Fax: 916-782-9134

Email: eramirez@ecorpconsulting.com

Project Description:

See the attached Project Location map.

Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Cultural_Resources\CASRP Cultural.aprx - CASRP Records Search 20250218 (lgalvez - 2/18/2025)



Map Date: 2/18/2025

Sources: ESRI, USGS

Records Search

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2024-080 Chico Airport Sewer Pond Repair Project

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

February 21, 2025

Erica Ramirez-Schroeder
ECORP Consulting, Inc.

Via Email to: eramirez@ecorpconsulting.com

Re: Chico Airport Pond Sewer Repair (2024-080) Project, Butte County

To Whom It May Concern:

As requested, a record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were negative. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, a SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. If within two weeks of notification, a response has not been received, the Commission requests that you follow-up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please notify the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at melina.carlos@nahc.ca.gov.

Sincerely,

Melina Carlos

Melina Carlos
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Butte County
2/21/2025

County	Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
Butte	Mechoopda Indian Tribe	F	Kyle McHenry, Cultural Director	1920 Alcott Ave Chico, CA, 95928	(530) 899-8922		kmchenry@mechoopda-nsn.gov	KonKow Maidu	Butte,Glenn,Tehama	3/23/2023
	Mechoopda Indian Tribe	F	Dennis Ramirez, Chairperson	1920 Alcott Ave Chico, CA, 95928	(530) 899-8922	(530) 899-8517	dramirez@mechoopda-nsn.gov	KonKow Maidu	Butte,Glenn,Tehama	3/23/2023
	Mooretown Rancheria of Maidu Indians	F	Guy Taylor,	#1 Alverda Drive Oroville, CA, 95966	(530) 533-3625			KonKow Maidu	Butte,Glenn,Lassen,Plumas,Shasta,Sierra,Sutter,Tehama,Yuba	1/15/2019
	Mooretown Rancheria of Maidu Indians	F	Benjamin Clark, Chairperson	#1 Alverda Drive Oroville, CA, 95966	(530) 533-3625	(530) 533-3680	frontdesk@mooretown.org	KonKow Maidu	Butte,Glenn,Lassen,Plumas,Shasta,Sierra,Sutter,Tehama,Yuba	
	Nevada City Rancheria Nisenan Tribe	N	Saxon Thomas, Tribal Council Member	P.O. Box 2226 Nevada City, CA, 95959	(530) 570-0846		shelly@nevadacityrancheria.org	Nisenan	Butte,Nevada,Placer,Sierra,Sutter,Yuba	3/9/2022
	Nevada City Rancheria Nisenan Tribe	N	Richard Johnson, Chairman	P.O. Box 2624 Nevada City, CA, 95959	(530) 570-0846		shelly@nevadacityrancheria.org	Nisenan	Butte,Nevada,Placer,Sierra,Sutter,Yuba	2/15/2022
	Nevada City Rancheria Nisenan Tribe	N	Shelly Covert, Tribal Secretary	P.O. Box 2226 Nevada City, CA, 95959	(530) 570-0846		shelly@nevadacityrancheria.org	Nisenan	Butte,Nevada,Placer,Sierra,Sutter,Yuba	3/9/2022
	Round Valley Reservation/ Covelo Indian Community	F	James Russ, President	77826 Covelo Road Covelo, CA, 95428	(707) 983-6126	(707) 983-6128	tribalcouncil@rvit.org	ConCow Nomlaki Pit River Pomo Wailaki Wintun Yuki	Butte,Colusa,Glenn,Humboldt,Lake,Lassen,Mendocino,Modoc,Plumas,Shasta,Siskiyou,Sonoma,Sutter,Tehama,Trinity,Yuba	

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Chico Airport Pond Sewer Repair (2024-080) Project, Butte County.

Record: PROJ-2025-000989
Report Type: List of Tribes
Counties: Butte
NAHC Group: All

APPENDIX C

APE Photographs

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

 Resource/Project Name: Chico Airport Sewer Project (2024-080) **Year** 2025
Camera: Samsung S21 FE 5G Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Subject/Description	View Toward	Accession #
03	18	917	Overview: Culvert into Sheep's Hollow Creek	N	20250318_091705
03	18	919	Overview CA-01, Sheep's Hollow-Sycamore Creek Levee	SW	20250318_091943
03	18	922	Overview CA-01, Sheep's Hollow-Sycamore Creek Levee	E	20250318_092214
03	18	931	Overview APE	E	20250318_093149
03	18	945	Overview Second Berm South of Levee toe	W	20250318_094537
03	18	1050	Overview Concrete Dump	SE	20250318_105010
03	18	1051	Overview Concrete Dump	NE	20250318_105115
03	18	1052	Overview CA-02 Feature E, Pond	W	20250318_105211
03	18	1057	Overview CA-02 Features A and D, Tanks	NW	20250318_105745
03	18	1101	Overview CA-02 Features C and E, Tanks	NW	20250318_110138
03	18	1102	Overview CA-02 Feature F, Control/Pump Building	N	20250318_110228
03	18	1106	Detail CA-02 Feature D	NE	20250318_110624
03	18	1106	Detail CA-02 Feature D	Plan	20250318_110626
03	18	1106	Detail CA-02 Feature D	Plan	20250318_110630
03	18	1108	Detail CA-02 Feature F	NW	20250318_110803
03	18	1108	Detail CA-02 Feature F	Plan	20250318_110811
03	18	1108	Detail CA-02 Feature F	Plan	20250318_110816
03	18	1109	Detail CA-02 Feature F Southern Wall	Plan	20250318_110900
03	18	1115	Detail CA-02 Feature F Foundations	Plan	20250318_111503
03	18	1115	Detail CA-02 Feature F Foundations	Plan	20250318_111505
03	18	1115	Detail CA-02 Feature F Foundations	Plan	20250318_111511
03	18	1115	Detail CA-02 Feature F Foundations	Plan	20250318_111540
03	18	1115	Detail CA-02 Feature A	SW	20250318_111550
03	18	1117	Detail CA-02 Feature A	Plan	20250318_111707
03	18	1124	Overview CA-02 Features A, C, D, F	NE	20250318_112429
03	18	1128	Overview: Western End of Overview APE	S	20250318_112859
03	18	1130	Overview APE	NE	20250318_113028
03	18	1130	Overview APE	E	20250318_113032

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial

Resource/Project Name: Chico Airport Sewer Project (2024-080) **Year** 2025

Camera: Samsung S21 FE 5G Lens Size: 35mm
Film Type and Speed: Digital Negatives Kept at: ECORP Consulting, Inc.

Mo.	Day	Time	Subject/Description	View Toward	Accession #
03	18	1130	Overview APE	SE	20250318_113039
03	18	1130	Overview APE	NW	20250318_113045
03	18	1130	Overview APE	S	20250318_113049
03	18	1135	Overview CA-02, Feature E	E	20250318_113538
03	18	1136	Overview CA-02, Feature E	E	20250318_113626


20250318_091705


20250318_091943


20250318_092214


20250318_093149


20250318_094537


20250318_105010


20250318_105115


20250318_105211


20250318_105745


20250318_110138


20250318_110228


20250318_110624


20250318_110626


20250318_110630


20250318_110803


20250318_110811

20250318_110816

20250318_110900

20250318_111503

20250318_111505


20250318_111511


20250318_111540


20250318_111550


20250318_111707


20250318_112429


20250318_112859


20250318_113028(0)


20250318_113032

20250318_113039(0)

20250318_113045(0)

20250318_113049

20250318_113538

20250318_113626

APPENDIX D

Confidential Cultural Resource Site
Locations and Site Records

This Appendix contains information on the specific location of cultural resources. This information is not for publication or release to the general public. It is for planning, management and research purposes only. Information on the specific location of pre-contact and historic sites is exempt from the Freedom of Information Act and California Public Records Act.

Due to the sensitive nature of cultural resources, which is restricted from public distribution by state and federal law, this appendix has been removed. Individuals meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology may request copies of the confidential documentation from the California Office of Historic Preservation's California Historical Resources Information System.

APPENDIX E

Energy Consumption Analysis for the Chico Airport Pond Sewer Repair Project,
ECORP Consulting Inc., November 2025

Chico Airport Pond Sewer Repair Project

Energy Consumption Analysis
Construction Off-Road Fuel Consumption

Phase Name	Off-Road Equipment	Quantity	Usage (hrs)	Horsepower (hp)	Load Factor	Fuel Consumption Rate (gallon/hr)[1]	Total Hours	Number of Days	Total Fuel Consumption (gallon)
Site Preparation	Rubber Tired Dozers	3	8	367	0.4	7.62	24	10	1,828.5
Site Preparation	Tractors/Loaders/Backhoes	4	8	84	0.37	1.79	32	10	573.9
Grading	Graders	1	8	148	0.41	3.15	8	20	503.9
Grading	Excavators	2	8	36	0.38	0.79	16	20	252.6
Grading	Tractors/Loaders/Backhoes	2	8	84	0.37	1.79	16	20	573.9
Grading	Rubber Tired Dozers	1	8	367	0.4	7.62	8	20	1,219.0
Grading	Scrapers	2	7	423	0.48	10.54	14	20	2,950.6
Building Construction	Forklifts	3	8	82	0.2	0.95	24	36	817.6
Building Construction	Generator Sets	1	8	14	0.74	0.60	8	36	172.2
Building Construction	Welders	1	8	46	0.45	1.19	8	36	344.0
Building Construction	Tractors/Loaders/Backhoes	3	7	84	0.37	1.79	21	36	1,355.7
Building Construction	Cranes	1	8	367	0.29	5.52	8	36	1,590.8
Building Construction	Trenchers	1	8	40	0.5	1.15	8	36	332.4
Building Construction	Plate Compactors	1	6	8	0.43	0.20	6	36	42.9
Total Construction Off-Road Fuel (Diesel) Consumption (gallon)									***12,558***
Countywide Off-Road Fuel (Diesel) Consumption (2024) (gallon)									***2,310,631***

Notes:

1. Fuel Consumption Rate = Horsepower x Load Factor x Fuel Consumption Factor

   Fuel Consumption Factor: Brake Specific Fuel Capacity is converted from diesel lb/hp-hr to diesel gallon/hp-hr

   Environmental Protection Agency, 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2*

2. Countywide off-road diesel consumption is from CARB's OFFROAD2021 (v1.0.5) Emissions Inventory.

Source: Refer to CalEEMod outputs for assumptions used in this analysis as well as equipment usage.

Chico Airport Pond Sewer Repair Project

Energy Consumption Analysis
Construction On-Road Fuel Consumption

Worker Trips						
Phase Name	**Phase Length**	**# of Trips**	**Worker Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Site Preparation	10	17.5	10.3	1,802.5	**26.31424569**	*68.5*
Grading	20	20.0	10.3	4,120.0		*156.6*
Building Construction	36	20.0	10.3	7,416.0		*281.8*
					Worker Trips Total (Gasoline)	*507*

Vendor Trips						
Phase	**Phase Length**	**# of Trips**	**Vendor Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Site Preparation	10	0	0	0	**9.872717893**	*0.0*
Grading	20	0	0	0		*0.0*
Building Construction	36	1	5	162		*16.4*
					Vendor Trips Total (Diesel)	*16*

Hauling Trips						
Phase	**Phase Length**	**# of Trips**	**Hauling Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Site Preparation	10	0	0	0	**9.872717893**	*0.0*
Grading	20	0	0	0		*0.0*
Building Construction	36	1	20	720		*7,108.4*
					Hauling Trips Total (Diesel)	*7,108*
					Construction On-Road Diesel Consumption	***7,125***
					Construction Off-Road Diesel Consumption	***12,558***

Total Construction On-Road Gasoline Consumption (gallon)	**Total Construction Off-Road and On-Road Diesel Consumption (gallon)**
507	19,683
Countywide On-Road Gasoline Consumption (2024)	**Countywide Off-Road and On-Road Diesel Consumption (2024)**
72,177,628	26,441,856
Percentage Increase Countywide	
Gasoline Consumption[1]	**Diesel Consumption[1,2]**
0.0007%	0.0744%

Notes:

1. Countywide fuel consumption rates, on-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB's EMFAC2021.
2. Countywide off-road fuel consumption is from CARB's OFFROAD2021 (v1.0.5) Emissions Inventory.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.

APPENDIX F

Special-Status Plant Survey Report for the Chico Airport Pond Sewer Repair Project, ECORP Consulting Inc., October 2025

Special-Status Plant Survey Report for the Chico Airport Pond Sewer Repair Project

City of Chico, Butte County, California

Prepared For:

Bennett Engineering Services
1082 Sunrise Avenue, Suite 100
Roseville, CA 95661

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
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LIST OF ACRONYMS AND ABBREVIATIONS

Term/Acronym	Definition
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ECORP	ECORP Consulting, Inc.
ESA	Endangered Species Act
MCV	Manual of California Vegetation
MSL	Mean Sea Level
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
Project	Chico Airport Sewer Repair Project
SNC	Sensitive Natural Community
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

On behalf of Bennett Engineering Services, ECORP Consulting, Inc. (ECORP) conducted a special-status plant survey for the Chico Airport Sewer Repair Project (Project) in the City of Chico, Butte County, California. The purpose of this survey was to identify and map the locations of special-status plant species and Sensitive Natural Communities (SNCs; as defined in Sections 1.2 and 1.4), if observed within the Survey Area for the Project (Survey Area). The survey was conducted to support regulatory permitting for the Project.

1.1 Location

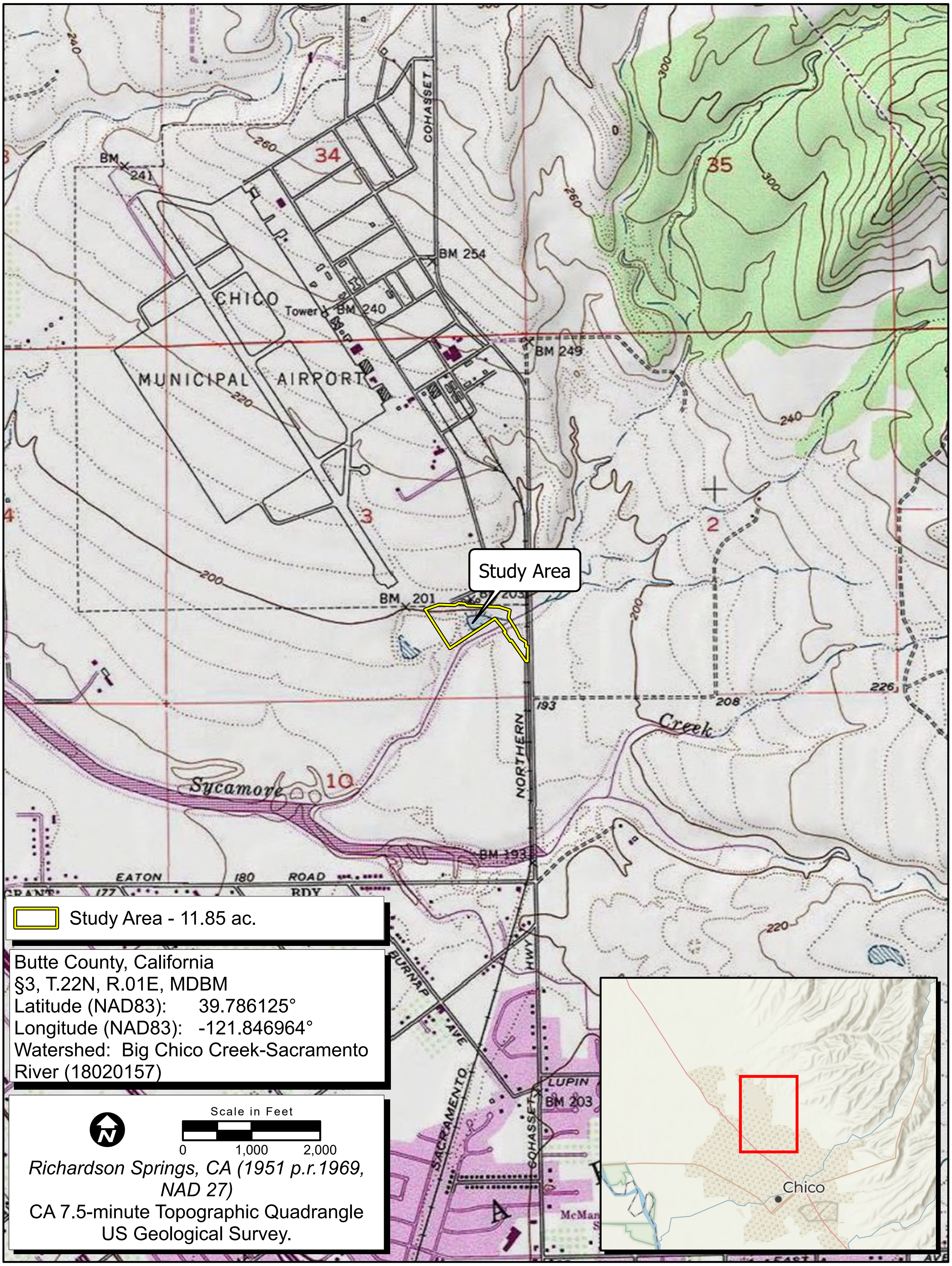
The approximately 11.85-acre survey area for the Project (Survey Area) is located west of Cohasset Road, southeast of the Chico Municipal Airport, and north of Morseman Avenue (Figures 1 and 2). The Survey Area corresponds to a portion of Section 3, Township 22 North, Range 1 East (Mount Diablo Base and Meridian) of the 1969 photorevised edition of the 1951 U.S. Geological Survey (USGS) *Richardson Springs, California* 7.5-minute quadrangle. The approximate center of the Survey Area is located at latitude 39.786125° and longitude -121.846964° within the Big Chico Creek-Sacramento River Watershed (Hydrological Unit Code 18020157; USGS 2024).

1.2 Definition of Special-Status Plant Species

For the purposes of this report *special-status plants* are defined as plants that meet one or more of the following:

- Plants listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA).
- Plants listed, proposed for listing, or candidates for future listing as threatened or endangered under the California ESA.
- Plants that meet the definitions of endangered or rare under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines.
- Plants listed as rare under the California Native Plant Protection Act (California Department of Fish and Game Code of California, Section 1900 et seq.).
- Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1B and 2).
- Plants listed by the CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4).

CRPRs are further described in the following section.



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Map Date: 9/29/2025
Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

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Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aerial_Maps\CASRP Aerials.aprx - CASRP Project Setting 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

Sources: Maxar, Esri World Imagery

Figure 2. Project Setting

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2024-138.02A Chico Airport Pond Sewer Repair Project

1.3 California Rare Plant Ranks

The CNPS maintains the Rare Plant Inventory (CNPS 2024a), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs.

The rank system was developed in collaboration with government, academia, nongovernmental organizations, and private sector botanists, and is jointly managed by the California Department of Fish and Wildlife (CDFW) and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- CRPR 1A – presumed extirpated in California and either rare or extinct elsewhere
- CRPR 1B – rare, threatened, or endangered in California and elsewhere
- CRPR 2A – presumed extirpated in California, but more common elsewhere
- CRPR 2B – rare, threatened, or endangered in California but more common elsewhere
- CRPR 3 – a review list of plants about which more information is needed
- CRPR 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 0.1 through 0.3, with 0.1 being the most threatened and 0.3 being the least threatened. Threat Ranks are generally assigned for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

- Threat Rank 0.1 – Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat);
- Threat Rank 0.2 – Moderately threatened in California (20 to 80 percent occurrences threatened/moderate degree and immediacy of threat); and
- Threat Rank 0.3 – Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known).

Factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in assigning the Threat Rank, and differences in Threat Ranks do not constitute additional or different protection (CNPS 2024a). Depending on the policy of the lead agency, substantial impacts to plants listed as CRPR 1A, 1B, 2A, and 2B (regardless of Threat Rank) are typically considered significant under CEQA Guidelines Section 15380. Significance under CEQA is typically evaluated on a case-by-case basis for CRPR 3 or 4 plants.

1.4 Sensitive Natural Communities

CDFW maintains the California Natural Community List (CDFW 2023), which provides a list of vegetation alliances, associations, and special stands as defined in *A Manual of California Vegetation*, Online Edition (MCV; CNPS 2024b), along with their respective state and global rarity ranks. Natural communities with a state rarity rank of S1, S2, or S3 are considered SNCs. Depending on the policy of the lead agency, impacts to SNCs may be considered significant under CEQA.

2.0 METHODS

2.1 Literature Review

ECORP biologists reviewed existing available information for the Survey Area prior to conducting field surveys. Literature sources included aerial imagery, soil survey mapping available from the Natural Resources Conservation Service (NRCS) *Web Soil Survey*, U.S. Fish and Wildlife Service (USFWS) *National Wetlands Inventory* mapping, and other relevant literature as cited throughout this document. ECORP reviewed the following resources to identify special-status plants and SNCs that have been documented in or near the Survey Area:

- CDFW CNDDB data for the Richardson Springs, California 7.5-minute quadrangle and the surrounding eight quadrangles (CDFW 2024);
- CNPS Rare Plant Inventory data for the Richardson Springs, California 7.5-minute quadrangle and the surrounding eight quadrangles (CNPS 2024a);
- USFWS Information for Planning and Consultation System Resource Report List for the Survey Area (USFWS 2024a); and
- CDFW VegCAMP vegetation data (CDFW 2018a).

2.2 Special-Status Plants Considered for the Survey Area

Based on the literature review, a list of special-status plant species that are known to occur or have the potential to occur within the vicinity of the Survey Area was generated (Appendix A). Only special-status plants as defined in Section 1.2 were included in this analysis. Each of these species' potential to occur within the Survey Area was assessed based on the following criteria:

- *Present* – Species is known to occur within the Survey Area based on documented occurrences within the CNDDB or other literature.
- *Potential to Occur* – Habitat (including soils and elevation requirements) for the species occurs within the Survey Area.
- *Low Potential to Occur* – Marginal or limited amounts of habitat occurs, and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.

- *Presumed Absent* – No suitable habitat (including soils and elevation requirements) or the species is not known to occur in the vicinity based on CNDDB records and other documentation.

2.3 Target Species

All species presented in Appendix A that were determined to be present, have potential to occur, or have low potential to occur within the Survey Area, as defined in Section 2.2, were included as targets for the survey. These species include the following:

- Depauperate milk-vetch (*Astragalus pauperculus*)
- Big-scale balsamroot (*Balsamorhiza macrolepis*)
- Butte County calycadenia (*Calycadenia oppositifolia*)
- Spicate calycadenia (*Calycadenia spicata*)
- Silky cryptantha (*Cryptantha crinita*)
- Red-stemmed cryptantha (*Cryptantha rostellata*)
- Dwarf downingia (*Downingia pusilla*)
- Adobe-lily (*Fritillaria pluriflora*)
- Hogwallow starfish (*Hesperevax caulescens*)
- Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*)
- Woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*)
- Veiny monardella (*Monardella venosa*)
- Tehama navarretia (*Navarretia heterandra*)
- Ahart's paronychia (*Paronychia ahartii*)
- Bidwell's knotweed (*Polygonum bidwelliae*)

Some species in Appendix A, including those that occur in vernal pools and marshes and swamps, were included as preliminary target species during the first field visit for the plant survey. The preliminary target list was refined after site conditions were verified and the field biologist determined there is no suitable habitat for those species within the Survey Area.

2.4 Reference Sources

Herbaria specimens, photographs from Calflora (2024) and Calphotos (University of California, Berkeley 2024), and information from *Jepson eFlora* (Jepson Flora Project 2024) were used as references to assess phenology and observe morphology of the target species. In addition, site visits to reference populations for Butte County meadowfoam and woolly meadowfoam were made on April 11, 2024 in

Butte County, California. The reference population visits, and review of other reference sources confirmed that the survey coincided with identifiable periods for all target species.

2.5 Field Surveys

Determinate-level field surveys were conducted by ECORP biologist Hannah Stone on April 19 and June 11, 2024 in accordance with guidelines promulgated by the USFWS (USFWS 2000), CDFW (2018b), and the CNPS (CNPS 2001). Ms. Stone's qualifications are included in Appendix B. The biologist walked meandering transects throughout the Survey Area to ensure complete coverage of all suitable habitat for all target species.

A complete list of all plants observed within the Survey Area was generated (Appendix C). All species were identified to the lowest possible taxonomic level required to assess rarity. Plant species identification, nomenclature, and taxonomy followed the *Jepson eFlora* (Jepson Flora Project 2024).

The biologist visually assessed and noted representative characteristics of all vegetation communities and compared vegetation composition and boundaries to existing VegCamp vegetation data (CDFW 2018a). Vegetation communities were classified based on the MCV (CNPS 2024b).

3.0 EXISTING SITE CONDITIONS

3.1 Vegetation Communities and Land Cover Types

The Survey Area is a partially developed lot that includes wastewater treatment ponds, roads, gates, and other associated infrastructure. The Survey Area is located on relatively level terrain situated at an elevational range of approximately 195-200 feet above Mean Sea Level (MSL) in the Cascade Range Foothills Subregion of the Cascade Ranges Region of the California Floristic Province (Jepson Flora Project 2024).

Vegetation communities were qualitatively assessed during the survey and generally mapped using aerial imagery. Vegetation mapping was not conducted using the *CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé* (CNPS 2024c).

Two vegetation communities or land cover types were identified within the Survey Area (Figure 3) and are described in the following sections as observed during the field surveys. No SNCs were present within the Survey Area.

3.1.1 Annual Grassland

Annual grassland is found in the southeastern portion of the Survey Area. This vegetation community was dominated by nonnative annual grasses including slender wild oat (*Avena barbata*), medusahead grass (*Elymus caput-medusae*), soft brome (*Bromus hordeaceus*), and ripgut brome (*Bromus diandrus*). Predominant forbs included yellow star-thistle (*Centaurea solstitialis*), broadleaf filaree (*Erodium botrys*), rose clover (*Trifolium hirtum*), milk thistle (*Silybum marianum*), and gumplant (*Grindelia* sp.).

Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Vegetation_and_LandCover\CASRP Vegetation.aprx - CASRP Vegetation 20240603 (lgalvez - 9/30/2025)

Map Date: 9/30/2025

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Scale in Feet
0 200

Figure 3. Vegetation Communities and Land Cover Types

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The annual grassland most resembles the *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance as characterized by the MCV. Semi-natural alliances are strongly dominated by nonnative plants that have become naturalized in the State, do not have state rarity rankings, and are not considered SNCs (CNPS 2024b).

3.1.2 Developed/Disturbed

The majority of the Survey Area consists of the developed or disturbed land cover type. Developed portions of the Survey Area were composed of portions of hardened and compacted earth roadways. These were mostly devoid of vegetation except patches of ruderal vegetation in less maintained portions of the roadways including bur clover (*Medicago polymorpha*), broadleaf filaree, cut-leaf plantain (*Plantago coronopus*), and rat-tail fescue (*Festuca myuros*). The remaining parts of this land cover include undeveloped areas that were previously graded and disturbed relic grassland with yellow star-thistle, milk thistle, ripgut brome, foxtail barley (*Hordeum murinum*), broadleaf filaree, and bur clover.

3.2 Aquatic Resources

An aquatic resources delineation has not been conducted. This preliminary aquatic resources assessment is based on a site reconnaissance conducted on May 6, 2024 and the National Wetlands Inventory (NWI) data (USFWS 2024b; Figure 4). Based on observations during the site visit, there are two constructed detention ponds, which are depicted as one freshwater pond in the NWI (Figure 4), one naturally-occurring intermittent drainage (depicted as the easternmost freshwater emergent wetland in the NWI, and one constructed drainage (not depicted in the NWI) present within the Survey Area. The other features depicted on Figure 4 were not observed during the site visit. Potential aquatic resources are described in the following sections.

3.2.1 Intermittent Drainage

The intermittent drainage within the Survey Area flows east to west adjacent to and bisects the southeastern portion of the Survey Area. Bermuda grass (*Cynodon dactylon*) was the dominant plant species within the drainage with creeping spikerush (*Eleocharis macrostachya*) and hairy water fern (*Marsilea vestita*) common in deeper areas. Sparsely scattered trees, including valley oak (*Quercus lobata*), and honeylocust (*Gleditsia triacanthos*) grow along the banks of the drainage.

3.2.2 Constructed Drainage

There is a constructed drainage located near the Survey Area's northwest and southwest boundaries. This drainage is culverted on both ends. The bed of the drainage is made up of highly compacted soil and gravel and devoid of vegetation, except for a few scattered spotted spurge (*Euphorbia maculata*).

Map Contents

Study Area - 11.85 ac.

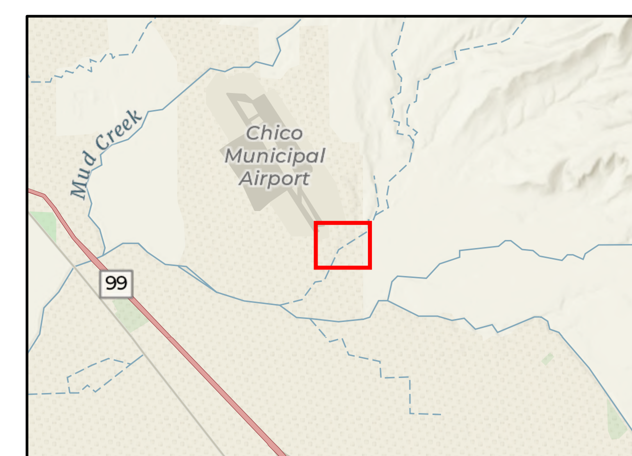
NWI Type

Freshwater Emergent Wetland

Freshwater Pond

Riverine

Sources: Maxar, Esri World Imagery, NWI 2024



Location: N:\2024\2024-080 Chico Airport Sewer Repair Survey\MAPS\Aquatic_Resources\CASRP Aquatic Resources.aprx - CASRP NWI 20240603 (lgalvez - 9/29/2025)

Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 4. National Wetlands Inventory

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3.2.3 Pond

There are two constructed detention ponds within the Survey Area that are utilized for the City of Chico's wastewater system. Patches of annual forbs, including prostrate knotweed (*Polygonum aviculare*), white goosefoot (*Chenopodium album*), and purslane speedwell (*Veronica peregrina* ssp. *xalapensis*), were scattered throughout the pond. The margins of the pond were dominated by yellow star-thistle, bur chervil (*Anthriscus caucalis*), and rough cockle-bur (*Xanthium strumarium*).

3.3 Soils and Geology

According to the *Web Soil Survey* (NRCS 2024a), four soil units, or types, have been mapped within the Survey Area (Figure 5):

- 300—Redsluff gravelly loam, 0 to 2 percent slopes
- 301—Wafap-Hamslough, 0 to 2 percent slopes
- 302—Redtough-Redswale, 0 to 2 percent slopes
- 991—Xerofluvents and 0 to 4 percent slopes frequently flooded

The Redsluff series consists of very deep, moderately well drained soils that formed in overbank alluvium over channel alluvium from predominantly volcanic rocks. Redsluff soils are on low fan terraces. Slopes range from 0 to 2 percent (NRCS 2024b).

The Wafap series consists of deep, somewhat poorly drained soils that formed in alluvium from volcanic rocks. Wafap soils are on bars on low stream terraces. Slopes range from 0 to 2 percent (NRCS 2024b).

The Hamslough series consists of moderately deep, poorly drained soils that formed in alluvium from volcanic rocks. Hamslough soils are in channels on low stream terraces and strath terraces. Slopes range from 0 to 2 percent (NRCS 2024b).

The Redtough series consists of shallow, somewhat poorly drained soils that formed in alluvium from predominantly volcanic rocks. Redtough soils are on mounds and risers on high fan terraces and are on strath terraces on Cascade foothills. Slopes range from 0 to 15 percent (NRCS 2024b).

The Redswale series consists of very shallow, poorly drained soils that formed in alluvium from predominantly volcanic rocks. Redswale soils are in swales on high fan terraces and are on strath terraces on Cascade foothills. Slopes range from 0 to 3 percent (NRCS 2024b).

Xerofluvents consist of very deep, somewhat poorly drained or moderately well drained soils that formed in alluvium derived from mixed rock sources. These soils are on bars and in channels on flood plains along tributaries of the Sacramento River. Slopes range from 0 to 4 percent (NRCS 2006).

No soil units derived from serpentinite or other ultramafic parent materials and no alkaline soils have been reported to occur within the Survey Area or its immediate vicinity (Horton 2017; Jennings et al. 1977; NRCS 2024b).

Map Contents

Study Area - 11.85 ac.

Series Number - Series Name

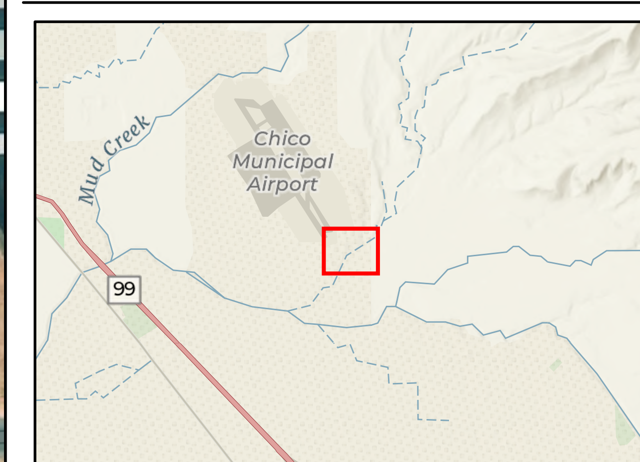
300 - Redsluff gravelly loam, 0 to 2 percent slopes

301 - Wafap-Hamslough , 0 to 2 percent slopes

302 - Redtough-Redswale , 0 to 2 percent slopes

991 - Xerofluvents and 0 to 4 percent slopes frequently flooded

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for BUTTE, CA



Map Date: 9/29/2025

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Scale in Feet
0 200

Figure 5. Natural Resources Conservation Service Soil Types

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3.4 Butte County Calycadenia

Butte County calycadenia (*Calycadenia oppositifolia*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs on volcanic, granitic, and serpentinite areas of chaparral, cismontane woodland, lower montane coniferous forest, meadows, seeps, and valley and foothill grassland. Butte County calycadenia blooms from April through July and is known to occur at elevations ranging from 295 to 3,100 feet above MSL. This species is endemic to California; the current range is Butte County (CNPS 2024a).

There are no documented CNDDB occurrences of Butte County calycadenia within 5 miles of the Survey Area (CDFW 2024). The annual grassland within the Survey Area represents marginally suitable habitat for this species. Butte County calycadenia has low potential to occur onsite.

3.5 Spicate Calycadenia

Spicate calycadenia (*Calycadenia spicata*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.3 species. This species is an herbaceous annual that occurs on adobe, clay, disturbed, dry, gravelly, roadsides, opening, and rocky areas of cismontane woodland and valley and foothill grasslands. Spicate calycadenia blooms from March through September and is known to occur at elevations ranging from 130 to 4,595 feet above MSL. This species is endemic to California; the current range includes Amador, Butte, Calaveras, El Dorado, Fresno, Kern, Nevada, Placer. Sacramento, San Joaquin, Stanislaus, Tulare, Tuolumne, and Yuba Counties (CNPS 2024a).

There are no documented CNDDB occurrences of spicate calycadenia within 5 miles of the Survey Area (CDFW 2024). The annual grassland and disturbed areas within the Survey Area represents suitable habitat for this species. Spicate calycadenia has potential to occur onsite.

3.6 Silky Cryptantha

Silky cryptantha (*Cryptantha crinita*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an annual herb that occurs in gravelly streambeds within cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, and valley and foothill grasslands. Silky cryptantha blooms from April through May and is known to occur at elevations ranging from 200 feet to 3,985 feet above MSL. The current range of this species includes Glenn, Shasta, and Tehama counties (CNPS 2024a).

There are no documented CNDDB occurrences of silky cryptantha within 5 miles of the Survey Area (CDFW 2024). The drainages within the Survey Area represents marginally suitable habitat for this species. Silky cryptantha has low potential to occur onsite.

3.7 Red-Stemmed Cryptantha

Red-stemmed cryptantha (*Cryptantha rostellata*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs on gravelly, volcanic openings as well as roadsides, in cismontane woodland and valley and foothill grassland. Red-stemmed cryptantha blooms from April through June and is known to occur at elevations ranging from 130 to 2,625 feet above MSL. The current range of this species includes Butte, Colusa, Napa, and Sutter counties (CNPS 2024a).

There are no documented CNDDB occurrences of red-stemmed cryptantha within 5 miles of the Survey Area (CDFW 2024). The annual grassland and disturbed areas within the Survey Area represents marginally suitable habitat for this species. Red-stemmed cryptantha has low potential to occur onsite.

3.8 Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas of valley and foothill grasslands. Dwarf downingia has also been found in artificial features such as tire ruts, scraped depressions, stock ponds, and roadside ditches. This species blooms from March through May and is known to occur at elevations ranging from 5 to 1,460 feet above MSL. The current range of this species in California includes Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2024a).

There are no documented CNDDB occurrences of dwarf downingia within 5 miles of the Survey Area (CDFW 2024). The annual grassland within the Survey Area represents marginally suitable habitat for this species. Dwarf downingia has low potential to occur onsite.

3.9 Adobe-Lily

Adobe-lily (*Fritillaria pluriflora*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial bulbiferous herb that often occurs on adobe soils in chaparral, cismontane woodland, and valley and foothill grassland. Adobe-lily blooms from February through April and is known to occur from 195 to 2,315 feet above MSL. Adobe-lily is endemic to California; the current range of this species includes Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama, and Yolo counties (CNPS 2024a).

There are five documented CNDDB occurrences of adobe-lily within 5 miles of the Survey Area (CDFW 2024). The annual grassland within the Survey Area represents marginally suitable habitat for this species. Adobe-lily has low potential to occur onsite.

3.10 Hogwallow Starfish

Hogwallow starfish (*Hesperevax caulescens*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in mesic, clay areas within valley and foothill grassland and shallow vernal pools, sometimes in alkaline areas. Hogwallow starfish blooms from March through June and is known to occur from sea level to 1,655 feet above MSL. Hogwallow starfish is endemic to California; the current range of this species includes Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Mariposa, Merced, Monterey, Sacramento, San Diego, San Joaquin, San Luis Obispo, Solano, Sonoma, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties. It is presumed extirpated in San Diego county (CNPS 2024a).

There are no documented CNDDB occurrences of hogwallow starfish within 5 miles of the Survey Area (CDFW 2024). The ponds within the Survey Area represents marginally suitable habitat for this species. Hogwallow starfish has low potential to occur onsite.

3.11 Butte County Meadowfoam

Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) is listed as endangered pursuant to both the federal and California ESAs, and is designated as a CRPR 1B.1 species. Butte County meadowfoam is an herbaceous annual that occurs in vernal pools and mesic areas of valley and foothill grasslands. Butte County meadowfoam blooms from March through May and is known to occur at elevations between 150 to 3,050 feet above MSL. Butte County meadowfoam is endemic to California; the current known range for this species is Butte County (CNPS 2024a).

There are nine documented CNDDB occurrences of Butte County meadowfoam within 5 miles of the Survey Area (CDFW 2024). The ponds within the Survey Area represents very marginally suitable habitat for this species. A conservative assessment was made due to the listing status of this species and nearby occurrences. Butte County meadowfoam has low potential to occur onsite.

3.12 Woolly Meadowfoam

Woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in vernally mesic chaparral, cismontane woodland, valley and foothill grassland, and vernal pools. Woolly meadowfoam blooms from March through May and is known to occur at elevations ranging from 195 to 4,380 feet above MSL. The current known range for this species in California includes Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity counties (CNPS 2024a).

There are four documented CNDDB occurrences of woolly meadowfoam within 5 miles of the Survey Area (CDFW 2024). The ponds within the Survey Area represents marginally suitable habitat for this species. Woolly meadowfoam has low potential to occur onsite.

3.13 Veiny Monardella

Veiny monardella (*Monardella venosa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on heavy clay soils in cismontane woodland and valley and foothill grasslands. Veiny monardella blooms from May through July and is known to occur at elevations ranging from 195 to 1,345 feet above MSL. Veiny monardella is endemic to California; the current range of this species includes Butte, Sutter, Tuolumne, and Yuba counties (CNPS 2024a).

There are no documented CNDDB occurrences of veiny monardella within 5 miles of the Survey Area (CDFW 2024). The annual grassland within the Survey Area represents marginally suitable habitat for this species. Veiny monardella has low potential to occur onsite.

3.14 Tehama Navarretia

Tehama navarretia (*Navarretia heterandra*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in mesic areas in valley and foothill grassland and vernal pools. Tehama navarretia blooms from April through June and is known to occur at elevations ranging from 100 to 3,315 feet above MSL. The current range for Tehama navarretia in California includes Butte, Contra Costa, El Dorado, Napa, Shasta, Sonoma, and Tehama counties (CNPS 2024a).

There are no documented CNDDB occurrences of Tehama navarretia within 5 miles of the Survey Area (CDFW 2024). The ponds within the Survey Area represents marginally suitable habitat for this species. Tehama navarretia has low potential to occur onsite.

3.15 Ahart's Paronychia

Ahart's paronychia (*Paronychia ahartii*) is not listed as pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. Ahart's paronychia is an annual herb that occurs in cismontane woodland, valley foothill and grassland and vernal pools. Ahart's paronychia blooms from February through June and is known to occur at elevations ranging from 100 to 1,675 feet above MSL. Ahart's paronychia is endemic to California; the current range of this species includes Butte, Shasta, and Tehama counties (CNPS 2024a).

There are two documented CNDDB occurrences of Ahart's paronychia within 5 miles of the Survey Area (CDFW 2024). The annual grassland and disturbed areas within the Survey Area represents marginally suitable habitat for this species. Ahart's paronychia has low potential to occur onsite.

3.16 Bidwell's Knotweed

Bidwell's knotweed (*Polygonum bidwelliae*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in volcanic soil in areas of chaparral, cismontane woodland, and valley and foothills grassland. Bidwell's knotweed blooms from April through July and is known to occur at elevations ranging from 195 to 3,935 feet above MSL. This species is endemic to California; its current range includes Butte, Shasta, and Tehama counties (CNPS 2024a).

There are no documented CNDDB occurrences of Bidwell's knotweed within 5 miles of the Survey Area (CDFW 2024). The annual grassland and disturbed areas within the Survey Area represents marginally suitable habitat for this species. Bidwell's knotweed has low potential to occur onsite.

4.0 RESULTS AND DISCUSSION

No special-status plant species or SNCs were observed within the Survey Area during the survey. Therefore, the Project is not expected to impact special-status plants or SNCs.

Summer temperatures were unusually high in 2024 in the vicinity of the Survey Area. However, the Survey Area had thorough coverage and all plant species were still identifiable. Thus, the climactic conditions did not significantly affect the survey results and the potential for a false negative survey is low.

Plant survey results are typically considered valid for a period of 2-5 years. If Project construction occurs more than two years after completion of the plant survey, it is recommended that plant surveys be repeated per agency-promulgated protocols (CDFW 2018b; CNPS 2001; USFWS 2000) within the Project impact area including a 25-foot buffer for potential indirect effects.

5.0 REFERENCES

Calflora. 2024. Information on California plants for education, research, and conservation. Berkeley, California: *The Calflora Database* [a non-profit organization]. https://www.calflora.org/.

California Department of Fish and Wildlife (CDFW). 2024. *RareFind 5*. Online Version, commercial version dated: April 1, 2023. California Natural Diversity Database (CNDDB). The Resources Agency, Sacramento. https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed October 2024.

_____. 2023. *California Natural Community List*. https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities. Accessed October 2024.

_____. 2018a. VegCAMP. *Vegetation – Great Valley Ecoregion Geodatabase Feature Class [ds2632]*. Geographic Information Center, Chico Research Foundation. Publication date: October 11, 2018. https://map.dfg.ca.gov/metadata/ds2632.html.

_____. 2018b. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*. Sacramento.

California Native Plant Society (CNPS). 2024a. *Rare Plant Inventory* (online edition, v9.5). California Native Plant Society. Sacramento. http://www.rareplants.cnps.org/. Accessed October 2024.

_____. 2024b. *A Manual of California Vegetation*, Online Edition (MCV). Sacramento. https://vegetation.cnps.org/. Accessed October 2024.

_____. 2024c. *CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé Field Form*. April 16. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18599&inline.

_____. 2001. *CNPS Botanical Survey Guidelines*. http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf.

Horton, J. D. 2017. *0818, The State Geologic Map Compilation (SGMC) Geodatabase of the Conterminous United States: U.S. Geological Survey data release DOI: 10.5066/F7WH2N65*. U.S. Geological Survey, Denver, CO. https://doi.org/10.5066/F7WH2N65. Accessed October 2024.

Jennings, C. W., R. G. Strand, and T. H. Rogers. 1977. *Geologic map of California: California Division of Mines and Geology, scale 1:750,000*. https://mrdata.usgs.gov/geology/state/sgmc-lith.php?code=5.14#California. Accessed October 2024.

Jepson Flora Project. 2024. *Jepson eFlora*. https://ucjeps.berkeley.edu/eflora/. Accessed October 2024.

Natural Resources Conservation Service (NRCS). 2024a. *Web Soil Survey*. http://websoilsurvey.nrcs.usda.gov/. Accessed October 2024.

_____. 2024b. *Soil Survey Geographic Database for Butte County, California*. U.S. Department of Agriculture. https://gdg.sc.egov.usda.gov/. Accessed October 2024.

_____. 2006. *Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties.* U.S. Department of Agriculture.

University of California, Berkeley. 2024. *CalPhotos*. Berkeley Natural History Museums. Berkeley. https://calphotos.berkeley.edu/. Accessed October 2024.

U.S. Fish and Wildlife Service (USFWS). 2024a. *USFWS Resource Report List*. Information for Planning and Consultation. https://ipac.ecosphere.fws.gov/. Accessed October 2024.

_____. 2024b. National Wetlands Inventory, Wetlands Mapper. https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper. Accessed June 2024.

_____. 2000. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants*. January.

U.S. Geological Survey (USGS). 2024. *Watershed Boundary Dataset*. Data refreshed September 2024. https://hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer. Accessed October 2024.

LIST OF APPENDICES

APPENDIX A

Evaluation of Potentially Occurring Special-Status Plant Species

Common Name *(Scientific Name)*	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Sanborn's onion *(Allium sanbornii* var. *sanbornii)*	–	–	4.2	Chaparral, cismontane woodland, and lower montane coniferous forests, usually with gravelly, serpentine soil. Elevation: 855–4,955 feet Bloom Period: May–September	Presumed absent. No suitable habitat in the Survey Area and the Survey Area is significantly outside the known elevational range for this species.
Depauperate milk-vetch (*Astragalus pauperculus*)	–	–	4.3	Occurs within vernally mesic and volcanic soils in chaparral, cismontane woodland, and valley and foothill grasslands. Elevation: 195–3,985 feet Bloom Period: March–June	Low potential to occur. The ponds within the Survey Area may provide marginally suitable habitat.
Ferris' milk-vetch *(Astragalus tener* var. *ferrisiae)*	–	–	1B.1	Vernally mesic meadows and seeps and in sub–alkaline flats within valley and foothill grasslands. Elevation: 5–245 feet Bloom Period: April–May	Presumed absent. No alkaline habitat in the Survey Area.
Mexican mosquito fern *(Azolla microphylla)*	–	–	4.2	Marshes and swamps, ponds or slow–moving bodies of water. Elevation: 100–330 feet Bloom Period: August	Presumed absent. No suitable habitat in the Survey Area. The ponds do not support aquatic vegetation.
Big-scale balsamroot *(Balsamorhiza macrolepis)*	–	–	1B.2	Chaparral, cismontane woodland, and valley and foothill grassland, sometimes on serpentine soils. Elevation: 150–5,100 feet Bloom Period: March–June	Low potential to occur. The annual grassland within the Survey Area may provide marginally suitable habitat.
Valley brodiaea (*Brodiaea rosea* ssp. *vallicola*)	–	–	4.2	Occurs in old alluvial terraces and silt, sandy, or gravelly soils in vernal pools and swales within valley and foothill grassland. Elevation: 35–1,100 feet Bloom Period: April–May	Presumed absent. No vernal pools or swales in the Survey Area.
Callahan's mariposa-lily *(Calochortus syntrophus)*	–	–	1B.1	Cismontane woodland and vernally mesic valley and foothill grassland. Elevation: 1,725–3,755 feet Bloom Period: May–June	Presumed absent. The Survey Area is significantly outside the known elevational range for this species.

Common Name *(Scientific Name)*	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Butte County calycadenia *(Calycadenia oppositifolia*)	–	–	4.2	Occurs on volcanic, granitic, and serpentine areas of chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, and valley and foothill grassland. Elevation: 295–3,100 feet Bloom Period: April–July	Low potential to occur. The annual grassland within the Survey Area may provide marginally suitable habitat.
Spicate calycadenia *(Calycadenia spicata)*	–	–	1B.3	Adobe, clay, disturbed areas, dry, gravelly, openings, roadsides, and rocky sites within cismontane woodland and valley and foothill grassland. Elevation: 130–4,595 feet Bloom Period: May–September	Potential to occur. The annual grassland and disturbed areas within the Survey Area may provide suitable habitat.
Butte County morning-glory *(Calystegia atriplicifolia* ssp. *buttensis)*	–	–	4.2	Rocky soils and sometimes roadsides within chaparral, lower montane coniferous forest, and valley and foothill grassland. Elevation: 1,855–5,000 feet Bloom Period: May–July	Presumed absent. The Survey Area is significantly outside the known elevational range for this species.
Dissected-leaved toothwort (*Cardamine pachystigma* var. *dissectifolia*)	–	–	1B.2	Rocky, usually serpentine soils of chaparral and lower montane coniferous forest. Elevation: 835–6,890 feet Bloom Period: February–May	Presumed absent. No suitable habitat in the Survey Area and the Survey Area is significantly outside the known elevational range for this species.
Pink creamsacs *(Castilleja rubicundula* var. *rubicundula)*	–	–	1B.2	Serpentine substrates in chaparral openings, cismontane woodland, meadows and seeps, and valley and foothill grassland. Elevation: 65–2,985 feet Bloom Period: April–June	Presumed absent. No suitable soils in the Survey Area.
White-stemmed clarkia (*Clarkia gracilis* ssp. *albicaulis*)	–	–	1B.2	Sometimes serpentine soils of chaparral and cismontane woodland. Elevation: 805–3,560 feet Bloom Period: May–July	Presumed absent. The Survey Area is significantly outside the known elevational range for this species and does not include suitable habitat.

Common Name *(Scientific Name)*	**Status**			**Habitat Description/ Species Ecology**	**Potential to Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Mildred's clarkia (*Clarkia mildrediae* ssp. *mildrediae*)	–	–	1B.3	Sandy, usually granitic soils of cismontane woodland and lower montane coniferous forest. Elevation: 805–5,610 feet Bloom Period: May–August	Presumed absent. The Survey Area is significantly outside the known elevational range for this species and does not include suitable habitat.
Marsh claytonia (*Claytonia palustris*)	–	–	4.3	Meadows and seeps (mesic), marshes and swamps, and upper montane coniferous forest. Elevation: 3,280–8,205 feet Bloom Period: May–October	Presumed absent. The Survey Area is significantly outside the known elevational range for this species, and does not include suitable habitat.
Silky cryptantha (*Cryptantha crinita*)	–	–	1B.2	Gravelly streambeds of cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland, and valley and foothill grassland habitats. Elevation: 200–3,985 feet Bloom Period: April–May	Low potential to occur. The drainages within the Survey Area may provide marginally suitable habitat.
Red-stemmed cryptantha (*Cryptantha rostellata*)	–	–	4.2	Often gravelly volcanic openings and roadsides of cismontane woodland and valley and foothill grassland. Elevation: 130–2,625 feet Bloom Period: April–June	Low potential to occur. The annual grassland and disturbed areas within the Survey Area may provide marginally suitable habitat.
Dwarf downingia *(Downingia pusilla)*	–	–	2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species has also been found in disturbed areas such as tire ruts and scraped depressions (CDFW 2024[1]). Elevation: 5–1,460 feet Bloom Period: March–May	Low potential to occur. The ponds within the Survey Area may provide marginally suitable habitat.
Ahart's buckwheat (*Eriogonum umbellatum* var. *ahartii*)	–	–	1B.2	Serpentine soils, slopes, and openings of chaparral and cismontane woodland. Elevation: 1,310–6,560 feet Bloom Period: June–September	Presumed absent. No suitable habitat in the Survey Area and the Survey Area is significantly outside the known elevational range for this species.

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Common Name ***(Scientific Name)***	**Status**			**Habitat Description/ Species Ecology**	**Potential to Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
Shield-bracted monkeyflower *(Erythranthe glaucescens)*	–	–	4.3	Serpentine seeps and sometimes streambanks of chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Elevation: 195–4,070 feet Bloom Period: February–August	Presumed absent. No suitable soils in the Survey Area.
Hoover's spurge (*Euphorbia hooveri*)	FT	–	1B.2	Vernal pools. Elevation: 80–820 feet Bloom Period: July–September	Presumed absent. No suitable habitat in the Survey Area.
Butte County fritillary *(Fritillaria eastwoodiae)*	–	–	3.2	Chaparral, cismontane woodland, and openings in lower montane coniferous forest and occasionally is found on serpentine soils. Elevation: 165–4,920 feet Bloom Period: March–June	Presumed absent. No suitable habitat in the Survey Area.
Adobe lily *(Fritillaria pluriflora)*	–	–	1B.2	Adobe soils in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 195–2,315 feet Bloom Period: February–April	Low potential to occur. The annual grassland within the Survey Area may provide marginally suitable habitat.
Boggs Lake hedge-hyssop *(Gratiola heterosepala)*	–	CE	1B.2	Clay substrates of marshes and swamps (lake margins) and vernal pools. Elevation: 35–7,790 feet Bloom Period: April–August	Presumed absent. No suitable habitat in the Survey Area.
Hogwallow starfish *(Hesperevax caulescens)*	–	–	4.2	Mesic areas with clay soil within valley and foothill grassland, shallow vernal pools, and sometimes alkaline areas. Elevation: 0–1,655 feet Bloom Period: March–June	Low potential to occur. The ponds within the Survey Area may provide marginally suitable habitat.
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*	–	–	1B.2	Marshes and freshwater swamps. Often in riprap on sides of levees. Elevation: 0–395 feet Bloom Period: June–September	Presumed absent. No suitable habitat in the Survey Area.

Common Name *(Scientific Name)*	**Status**			**Habitat Description/ Species Ecology**	**Potential to Occur Onsite**
	ESA	**CESA/ NPPA**	**Other**		
California satintail *(Imperata brevifolia)*	–	–	2B.1	Mesic areas in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali) and riparian scrub. Elevation: 0–3,985 feet Bloom Period: September–May	Presumed absent. No suitable habitat in the Survey Area.
Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus)*	–	–	1B.1	Vernally mesic areas in chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation: 115–4,100 feet Bloom Period: March–June	Presumed absent. No suitable habitat in the Survey Area.
Coulter's goldfields *(Lasthenia glabrata* ssp. *coulteri*)	–	–	1B.1	Coastal marshes and swamps, playas, and vernal pools. Elevation: 5–4,005 feet Bloom Period: February–June	Presumed absent. No suitable habitat in the Survey Area and the Survey Area is significantly outside the known geographic range for this species (CDFW 2024).
Legenere *(Legenere limosa)*	–	–	1B.1	Various seasonally inundated areas including wetlands, wetland swales, marshes, vernal pools, artificial ponds, and floodplains of intermittent drainages (USFWS 2005[2]). Elevation: 5–2,885 feet Bloom Period: April–June	Presumed absent. No suitable habitat in the Survey Area.
Serpentine leptosiphon (*Leptosiphon ambiguus*)	–	–	4.2	Usually serpentine soils of cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation: 395–3,710 feet Bloom Period: March–June	Presumed absent. No suitable soils in the Survey Area.
Humboldt lily *(Lilium humboldtii* ssp. *humboldtii)*	–	–	4.2	Occurs in openings within chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 295–4,200 feet Bloom Period: May–July	Presumed absent. No suitable habitat in the Survey Area.

2

Common Name *(Scientific Name)*	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*)	FE	CE	1B.1	Mesic valley and foothill grassland and vernal pools. Elevation: 150–3,050 feet Bloom Period: March–May	Low potential to occur. The ponds within the Survey Area may provide very marginally suitable habitat. A conservative assessment was made due to the listing status of this species and nearby occurrences.
Woolly meadowfoam *(Limnanthes floccosa* ssp. *floccosa)*	–	–	4.2	Vernally mesic chaparral, cismontane woodland, valley and foothill grassland, and vernal pools. Elevation: 195–4,380 feet Bloom Period: March–May	Low potential to occur. The ponds within the Survey Area may provide marginally suitable habitat.
Veiny monardella *(Monardella venosa)*	–	–	1B.1	Heavy clay soils in cismontane woodland and valley and foothill grasslands. Elevation: 195–1,345 feet Bloom Period: May–July	Low potential to occur. The annual grassland within the Survey Area may provide marginally suitable habitat.
Tehama navarretia (*Navarretia heterandra*)	–	–	4.3	Mesic areas in valley and foothill grassland and vernal pools. Elevation: 100–3,315 feet Bloom Period: April–June	Low potential to occur. The ponds within the Survey Area may provide marginally suitable habitat.
California Orcutt grass (*Orcuttia californica*)	FE	CE	1B.1	Vernal pools Elevation: 50–2,165 feet Bloom Period: April–August	Presumed absent. The Survey Area is significantly outside the known geographic range for this species (CDFW 2024) and doesn't include suitable habitat.
Hairy Orcutt grass *(Orcuttia pilosa)*	FE	CE	1B.1	Vernal pools. Elevation: 150–655 feet Bloom Period: May–September	Presumed absent. No suitable habitat in the Survey Area.
Slender Orcutt grass *(Orcuttia tenuis)*	FT	CE	1B.1	Vernal pools, often gravelly. Elevation: 115–5,775 feet Bloom Period: May–September	Presumed absent. No suitable habitat in the Survey Area.

Common Name (Scientific Name)	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Ahart's paronychia (*Paronychia ahartii*)	–	–	1B.1	Well–drained rocky outcrops, often vernal pool edges, and volcanic upland (Hartman and Rabeler 2012[3]) of cismontane woodland, valley and foothill grassland, and vernal pools. Elevation: 100–1,675 feet Bloom Period: February–June	Low potential to occur. The annual grassland and disturbed areas within the Survey Area may provide marginally suitable habitat.
Bidwell's knotweed (*Polygonum bidwelliae*)	–	–	4.3	Volcanic soils of chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 195–3,935 feet Bloom Period: April–July	Low potential to occur. The annual grassland and disturbed areas within the Survey Area may provide marginally suitable habitat.
California beaked-rush *(Rhynchospora californica)*	–	–	1B.1	Bogs and fens, lower montane coniferous forest, seeps in meadows, and freshwater marshes and swamps. Elevation: 150–3,315 feet Bloom Period: May–July	Presumed absent. No suitable habitat in the Survey Area.
Brownish beaked-rush *(Rhynchospora capitellata)*	–	–	2B.2	Mesic areas in lower montane coniferous forest, upper montane coniferous forests, meadows and seeps, marshes and swamps. Elevation: 150–6,560 feet Bloom Period: July–August	Presumed absent. No suitable habitat in the Survey Area.
Hall's rupertia (*Rupertia hallii*)	–	–	1B.2	Sometimes roadsides and often openings in cismontane woodland and lower montane coniferous forest. Elevation: 1,790–7,380 feet Bloom Period: June–August	Presumed absent. The Survey Area is significantly outside the known elevational range for this species and does not provide suitable habitat.
Sanford's arrowhead *(Sagittaria sanfordii)*	–	–	1B.2	Shallow marshes and freshwater swamps. Elevation: 0–2,135 feet Bloom Period: May–October	Presumed absent. No suitable habitat in the Survey Area.

[3] Hartman, R. L. and R. K. Rabeler. 2012. *Paronychia ahartii*, in Jepson Flora Project (eds.) *Jepson eFlora*. https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=36286. Accessed October 2024.

Common Name *(Scientific Name)*	Status			Habitat Description/ Species Ecology	Potential to Occur Onsite
	ESA	CESA/ NPPA	Other		
Siskiyou jellyskin lichen (*Scytinium siskiyouense*)	–	–	1B.1	Epiphytic, usually on the bark of plants in the Fagaceae family, such as *Quercus* or *Chrysolepis,* in lower montane coniferous forest and North Coast coniferous forest. Elevation: 2,085–4,790 feet Bloom Period: N/A	Presumed absent. The Survey Area is significantly outside the known elevational range for this species.
Butte County checkerbloom (*Sidalcea robusta*)	–	–	1B.2	Chaparral and cismontane woodland. Elevation: 295–5,250 feet Bloom Period: April–June	Presumed absent. No suitable habitat in the Survey Area.
Northern slender pondweed (*Stuckenia filiformis* ssp. *alpina*)	–	–	2B.2	Assorted shallow freshwater marshes and swamps. Elevation: 985–7,055 feet Bloom Period: May–July	Presumed absent. The Survey Area is significantly outside the known elevational range for this species and does not provide suitable habitat.
Greene's tuctoria *(Tuctoria greenei)*	FE	CR	1B.1	Vernal pools. Elevation: 100–3,510 feet Bloom Period: May–July	Presumed absent. No suitable habitat in the Survey Area.
Brazilian watermeal *(Wolffia brasiliensis)*	–	–	2B.3	Assorted shallow freshwater marshes and swamps. Elevation: 65–330 feet Bloom Period: April–December	Presumed absent. No suitable habitat in the Survey Area. The ponds do not support aquatic vegetation.

Notes: CDFW = California Department of Fish and Wildlife; CESA = California Endangered Species Act; NPPA = Native Plant Protection Act; USFWS = U.S. Fish and Wildlife Service

Status Codes
FE ESA listed, Endangered
FT ESA listed, Threatened
CE CESA- or NPPA listed, Endangered
CR CESA- or NPPA-listed, Rare
1A CRPR/Presumed extinct
1B CRPR/Rare or Endangered in California and elsewhere
2A CRPR/Plants presumed extirpated in California but common elsewhere
2B CRPR/Plants rare, threatened, or endangered in California but more common elsewhere
3 CRPR/Plants About Which More Information is Needed – A Review List
4 CRPR/Plants of Limited Distribution – A Watch List
0.1 Threat Rank/Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
0.2 Threat Rank/Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
0.3 Threat Rank/Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

Sources: California Department of Fish and Wildlife (CDFW). 2024. *RareFind 5*. Online Version, commercial version dated: April 1, 2023. California Natural Diversity Database (CNDDB). The Resources Agency, Sacramento. https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed September 2024.

APPENDIX B

Statement of Qualifications

HANNAH STONE

Senior Biologist, ECORP Consulting, Inc.

Hannah Stone is a biologist with over 12 years of professional experience, specializing in botany, ecology, and preparation of biological technical documents. Ms. Stone holds a University of California, Davis Bachelor of Science degree in Ecological Management and Restoration, an interdisciplinary program that encompasses fields of ecology, applied plant biology, and the social sciences. She is a botany technical and field lead who is responsible for conducting database queries and creating the target lists, scheduling surveys to coincide with appropriate phenology of the target species, ensuring staff have information needed to locate and identify special-status plant species, and conducting reliable field surveys per agency protocols. Ms. Stone leads and conducts floristic botanical field surveys mostly in the Sacramento Valley and Sierra Nevada Foothills, but also has experience in the Cascade Range Foothills, High Sierra Nevada, San Joaquin Valley, San Francisco Bay Area, Modoc Plateau, and Outer North Coast Ranges. She is also experienced in conducting arborist surveys, vegetation community mapping, invasive plant mapping, mitigation and preserve monitoring, and assessing impacts and avoidance/minimization measures for rare plants and sensitive natural communities.

APPENDIX C

Plant Species Observed (April 19 and June 11, 2024)

SCIENTIFIC NAME	COMMON NAME
AMARANTHACEAE	**AMARANTH FAMILY**
*Amaranthus albus**	Pigweed amaranth
APIACEAE	**CARROT FAMILY**
*Anthriscus caucalis**	Bur chervil
Eryngium castrense	Great Valley button-celery
ASTERACEAE	**SUNFLOWER FAMILY**
*Centaurea solstitialis**	Yellow star-thistle
Centromadia fitchii	Fitch's spikeweed
Gnaphalium palustre	Western marsh cudweed
Grindelia sp.	Gumplant
*Heliotropium europaeum**	European heliotrope
*Hypochaeris glabra**	Smooth cat's-ear
*Lactuca serriola**	Prickly lettuce
Lasthenia fremontii	Fremont's goldfields
*Leontodon saxatilis**	Hairy hawkbit
*Logfia gallica**	Narrowleaf cotton rose
Matricaria discoidea	Pineapple weed
*Silybum marianum**	Milk thistle
Xanthium strumarium	Rough cockle-bur
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia eastwoodiae	Eastwood's fiddleneck
Amsinckia menziesii	Small flowered fiddleneck
Plagiobothrys canescens	Valley popcorn-flower
Plagiobothrys nothofulvus	Rusty popcorn-flower
Plagiobothrys stipitatus	Slender popcorn-flower
BRASSICACEAE	**MUSTARD FAMILY**
*Capsella bursa-pastoris**	Shepherd purse
*Hirschfeldia incana**	Shortpod mustard
Lepidium strictum	Upright pepperweed
CARYOPHYLLACEAE	**PINK FAMILY**
*Cerastium glomeratum**	Mouse-ear chickweed

SCIENTIFIC NAME	COMMON NAME
CARYOPHYLLACEAE	**PINK FAMILY**
*Petrorhagia dubia**	Pink grass
Spergularia sp.*	Sand spurry
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*Chenopodium album**	White goosefoot
*Salsola tragus**	Russian thistle
CONVOLVULACEAE	**MORNING-GLORY FAMILY**
*Convolvulus arvensis**	Field bindweed
CRASSULACEAE	**STONECROP FAMILY**
*Crassula tillaea**	Mediterranean pygmy-weed
CYPERACEAE	**SEDGE FAMILY**
Cyperus eragrostis	Tall flatsedge
Eleocharis macrostachya	Creeping spikerush
EUPHORBIACEAE	**SPURGE FAMILY**
Croton setiger	Turkey mullein
*Euphorbia maculata**	Spotted spurge
FABACEAE	**LEGUME FAMILY**
Acmispon americanus	Spanish clover
Acmispon sp.	Lotus
*Gleditsia triacanthos**	Honeylocust
Lupinus bicolor	Bicolored lupine
*Medicago polymorpha**	Bur clover
*Trifolium dubium**	Shamrock clover
*Trifolium hirtum**	Rose clover
*Trifolium subterraneum**	Subterranean clover
*Vicia sativa**	Spring vetch
*Vicia villosa**	Hairy vetch
FAGACEAE	**OAK FAMILY**
Quercus lobata	Valley oak
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	Broadleaf filaree

SCIENTIFIC NAME	COMMON NAME
GERANIACEAE	**GERANIUM FAMILY**
*Erodium cicutarium**	Red-stemmed filaree
*Erodium moschatum**	White-stemmed filaree
*Geranium dissectum**	Cut-leaved geranium
HYPERICACEAE	**ST. JOHN'S WORT FAMILY**
*Hypericum perforatum**	Klamath weed
JUNCACEAE	**RUSH FAMILY**
Juncus bufonius	Toad rush
LAMIACEAE	**MINT FAMILY**
Trichostema lanceolatum	Vinegar weed
LYTHRACEAE	**LOOSESTRIFE FAMILY**
*Lythrum hyssopifolia**	Hyssop loosestrife
MALVACEAE	**MALLOW FAMILY**
*Malva parviflora**	Cheeseweed
MARSILEACEAE	**MARSILEA FAMILY**
Marsilea vestita	Hairy water fern
MOLLUGINACEAE	**CARPET-WEED FAMILY**
*Mollugo verticillata**	Indian chickweed
MYRSINACEAE	**MYRSINE FAMILY**
*Lysimachia arvensis**	Scarlet pimpernel
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Epilobium brachycarpum	Panicled willow-herb
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California poppy
PLANTAGINACEAE	**PLANTAIN FAMILY**
*Plantago coronopus**	Cut-leaf plantain
*Plantago major**	Broad-leaf plantain
Veronica peregrina ssp. *xalapensis*	Purslane speedwell
POACEAE	**GRASS FAMILY**
*Aegilops triuncialis**	Barbed goatgrass
*Avena barbata**	Slender wild oat

SCIENTIFIC NAME	COMMON NAME
POACEAE	**GRASS FAMILY**
*Bromus diandrus**	Ripgut brome
*Bromus hordeaceus**	Soft brome
*Bromus madritensis**	Foxtail brome
*Cynodon dactylon**	Bermuda grass
*Elymus caput-medusae**	Medusahead grass
Elymus elymoides	Squirreltail
Festuca microstachys	Small fescue
*Festuca myuros**	Rat-tail fescue
*Festuca perennis**	Italian ryegrass
Hordeum marinum ssp. *gussoneanum**	Mediterranean barley
*Hordeum murinum**	Foxtail barley
Panicum sp.	Panic grass
*Paspalum dilatatum**	Dallis grass
*Poa annua**	Annual bluegrass
*Polypogon monspeliensis**	Annual rabbit-foot grass
Setaria parviflora	Bristley foxtail
POLYGONACEAE	**BUCKWHEAT FAMILY**
*Polygonum aviculare**	Prostrate knotweed
*Rumex crispus**	Curly dock
RUBIACEAE	**MADDER FAMILY**
*Galium parisiense**	Wall bedstraw
*Sherardia arvensis**	Field madder
SALICACEAE	**WILLOW FAMILY**
Populus fremontii	Fremont's cottonwood
Salix gooddingii	Goodding's black willow