Appendix A

Air Quality/Greenhouse Gas Emissions Calculations

North San Bernardino Channel Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	North San Bernardino Channel
Construction Start Date	4/1/2028
Operational Year	2029
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20000
Precipitation (days)	8.40000
Location	34.16877240935203, -117.31466946774606
County	San Bernardino-South Coast
City	San Bernardino
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5354
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.43

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
General Heavy Industry	107.560	1000sqft	2.46924	107,560	0.00000	—	—	—

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.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.27599	3.48763	22.0405	31.7782	0.09902	0.73590	5.13512	5.87102	0.67740	0.65371	1.33110	—	11,450.9	11,450.9	0.53738	0.34132	4.07942	11,570.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.76454	2.26791	15.2012	19.8027	0.05613	0.49967	4.59123	5.09091	0.45936	0.59122	1.05058	—	6,549.57	6,549.57	0.29848	0.20958	0.09339	6,619.58
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.62669	1.32996	8.82951	11.8761	0.03486	0.28957	2.47684	2.76641	0.26632	0.31671	0.58302	—	4,052.67	4,052.67	0.18819	0.12906	0.83801	4,096.67
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.29687	0.24272	1.61139	2.16739	0.00636	0.05285	0.45202	0.50487	0.04860	0.05780	0.10640	—	670.966	670.966	0.03116	0.02137	0.13874	678.251

2.2. Construction Emissions by Year

2.2.1. Total Construction Emissions by Year, Unmitigated

Includes both onsite and offsite emissions.

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

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

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	4.27599	3.48763	22.0405	31.7782	0.09902	0.73590	5.13512	5.87102	0.67740	0.65371	1.33110	—	11,450.9	11,450.9	0.53738	0.34132	4.07942	11,570.2
2029	0.76387	0.58435	5.94113	8.68308	0.01709	0.20937	4.14682	4.35619	0.19352	0.48705	0.68058	—	2,193.95	2,193.95	0.12651	0.15525	2.07754	2,245.45
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	2.76454	2.26791	15.2012	19.8027	0.05612	0.49967	4.59123	5.09091	0.45936	0.59122	1.05058	—	6,549.57	6,549.57	0.29848	0.20958	0.09339	6,619.58
2029	2.69811	2.19632	14.5252	19.5056	0.05613	0.46585	4.59123	5.05708	0.42948	0.59122	1.02071	—	6,517.30	6,517.30	0.29167	0.20328	0.08377	6,585.25
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	1.62669	1.32996	8.82951	11.8761	0.03486	0.28957	2.47684	2.76641	0.26632	0.31671	0.58302	—	4,052.67	4,052.67	0.18819	0.12906	0.83801	4,096.67
2029	0.40945	0.32831	2.42497	3.32014	0.00867	0.07970	1.00459	1.08429	0.07354	0.12444	0.19798	—	1,029.77	1,029.77	0.04942	0.04213	0.26985	1,043.83
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.29687	0.24272	1.61139	2.16739	0.00636	0.05285	0.45202	0.50487	0.04860	0.05780	0.10640	—	670.966	670.966	0.03116	0.02137	0.13874	678.251
2029	0.07472	0.05992	0.44256	0.60593	0.00158	0.01455	0.18334	0.19788	0.01342	0.02271	0.03613	—	170.490	170.490	0.00818	0.00698	0.04468	172.818

2.2.2. Onsite 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	3.98340	3.33689	20.2617	28.8438	0.08841	0.71557	4.29471	5.01028	0.65841	0.43996	1.09837	—	9,552.39	9,552.39	0.39551	0.09090	0.14581	9,589.52
2029	0.61884	0.51029	5.00453	7.24979	0.01111	0.19920	3.70095	3.90015	0.18335	0.37309	0.55645	—	1,181.73	1,181.73	0.05527	0.02245	0.13320	1,189.93
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	2.48465	2.06846	14.0612	16.9408	0.05014	0.48816	3.70095	4.18911	0.44919	0.37309	0.82228	—	5,116.32	5,116.32	0.21556	0.05491	0.00378	5,138.07
2029	2.43447	2.02718	13.4234	16.8107	0.05015	0.45568	3.70095	4.15663	0.41931	0.37309	0.79241	—	5,115.39	5,115.39	0.21483	0.05436	0.00345	5,136.97

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	1.48238	1.23674	8.11125	10.4062	0.03101	0.28216	2.02830	2.31046	0.25964	0.20552	0.46515	—	3,238.59	3,238.59	0.13569	0.03349	0.03385	3,251.99
2029	0.36182	0.30072	2.17884	2.84093	0.00726	0.07732	0.84779	0.92511	0.07115	0.08548	0.15664	—	746.621	746.621	0.03201	0.00907	0.01347	750.138
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.27053	0.22571	1.48030	1.89914	0.00566	0.05149	0.37016	0.42166	0.04738	0.03751	0.08489	—	536.185	536.185	0.02246	0.00554	0.00560	538.404
2029	0.06603	0.05488	0.39764	0.51847	0.00133	0.01411	0.15472	0.16883	0.01299	0.01560	0.02859	—	123.612	123.612	0.00530	0.00150	0.00223	124.194

2.2.3. Offsite 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.29259	0.21141	1.77877	3.62749	0.01061	0.02034	0.89028	0.90180	0.01899	0.21813	0.23273	—	1,898.54	1,898.54	0.14187	0.25042	3.93361	1,980.65
2029	0.14503	0.07406	0.93660	1.43329	0.00598	0.01017	0.44587	0.45604	0.01017	0.11396	0.12413	—	1,012.22	1,012.22	0.07124	0.13280	1.94434	1,055.52
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.27989	0.19946	1.14000	2.86198	0.00598	0.01152	0.89028	0.90180	0.01017	0.21813	0.22830	—	1,433.26	1,433.26	0.08292	0.15467	0.08962	1,481.51
2029	0.26364	0.16914	1.10174	2.69493	0.00598	0.01017	0.89028	0.90045	0.01017	0.21813	0.22830	—	1,401.91	1,401.91	0.07684	0.14891	0.08031	1,448.29
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.14431	0.09322	0.71826	1.46986	0.00385	0.00741	0.44855	0.45595	0.00668	0.11119	0.11787	—	814.083	814.083	0.05251	0.09558	0.80416	844.681
2029	0.04762	0.02758	0.24614	0.47921	0.00140	0.00238	0.15680	0.15918	0.00238	0.03896	0.04134	—	283.148	283.148	0.01741	0.03306	0.25638	293.690
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2028	0.02634	0.01701	0.13108	0.26825	0.00070	0.00135	0.08186	0.08321	0.00122	0.02029	0.02151	—	134.781	134.781	0.00869	0.01582	0.13314	139.847
2029	0.00869	0.00503	0.04492	0.08746	0.00026	0.00044	0.02862	0.02905	0.00044	0.00711	0.00754	—	46.8784	46.8784	0.00288	0.00547	0.04245	48.6238

2.3. Operations 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.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.51240	3.43195	0.77572	5.94932	0.00236	0.04371	0.05674	0.10045	0.03885	0.01441	0.05326	71.8806	241.636	313.516	7.19370	0.00402	0.15948	494.715
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.67876	2.66252	0.73786	1.23106	0.00205	0.03540	0.05674	0.09214	0.03257	0.01441	0.04698	71.8806	218.476	290.357	7.19292	0.00393	0.00414	471.355
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.22416	3.16793	0.55911	4.13702	0.00182	0.03101	0.05643	0.08745	0.02760	0.01433	0.04194	71.8806	186.229	258.109	7.19161	0.00369	0.06886	439.068
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.58841	0.57815	0.10204	0.75501	0.00033	0.00566	0.01030	0.01596	0.00504	0.00262	0.00765	11.9007	30.8323	42.7330	1.19065	0.00061	0.01140	72.6927

2.4. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01808	0.01565	0.01988	0.21054	0.00061	0.00037	0.05674	0.05710	0.00034	0.01441	0.01475	—	62.3807	62.3807	0.00219	0.00255	0.15948	63.3554
Area	3.40781	3.34361	0.03936	4.67803	0.00028	0.00831	—	0.00831	0.00628	—	0.00628	—	19.2367	19.2367	0.00081	0.00017	—	19.3061
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Off-Road	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Total	3.51240	3.43195	0.77572	5.94932	0.00236	0.04371	0.05674	0.10045	0.03885	0.01441	0.05326	71.8806	241.636	313.516	7.19370	0.00402	0.15948	494.715

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01721	0.01479	0.02138	0.17032	0.00057	0.00037	0.05674	0.05710	0.00034	0.01441	0.01475	—	58.4581	58.4581	0.00222	0.00263	0.00414	59.3018
Area	2.57504	2.57504	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Off-Road	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Total	2.67876	2.66252	0.73786	1.23106	0.00205	0.03540	0.05674	0.09214	0.03257	0.01441	0.04698	71.8806	218.476	290.357	7.19292	0.00393	0.00414	471.355
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01711	0.01469	0.02178	0.17729	0.00057	0.00037	0.05643	0.05680	0.00034	0.01433	0.01467	—	59.0674	59.0674	0.00222	0.00265	0.06886	59.9821
Area	3.14543	3.10145	0.02696	3.20413	0.00019	0.00569	—	0.00569	0.00430	—	0.00430	—	13.1759	13.1759	0.00055	0.00011	—	13.2234
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Off-Road	0.06163	0.05178	0.51037	0.75560	0.00105	0.02495	—	0.02495	0.02296	—	0.02296	—	113.986	113.986	0.00462	0.00092	—	114.377
Total	3.22416	3.16793	0.55911	4.13702	0.00182	0.03101	0.05643	0.08745	0.02760	0.01433	0.04194	71.8806	186.229	258.109	7.19161	0.00369	0.06886	439.068
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00312	0.00268	0.00398	0.03236	0.00010	0.00007	0.01030	0.01037	0.00006	0.00262	0.00268	—	9.77928	9.77928	0.00037	0.00044	0.01140	9.93072
Area	0.57404	0.56602	0.00492	0.58475	0.00003	0.00104	—	0.00104	0.00079	—	0.00079	—	2.18141	2.18141	0.00009	0.00002	—	2.18928
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	11.9007	0.00000	11.9007	1.18943	0.00000	—	41.6364
Off-Road	0.01125	0.00945	0.09314	0.13790	0.00019	0.00455	—	0.00455	0.00419	—	0.00419	—	18.8716	18.8716	0.00077	0.00015	—	18.9364
Total	0.58841	0.57815	0.10204	0.75501	0.00033	0.00566	0.01030	0.01596	0.00504	0.00262	0.00765	11.9007	30.8323	42.7330	1.19065	0.00061	0.01140	72.6927

3. Construction Emissions Details

3.1. Clearing and Grubbing (2028)

3.1.1. Onsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.37222	1.14814	8.33164	10.6216	0.02727	0.27357	—	0.27357	0.25168	—	0.25168	—	2,793.53	2,793.53	0.11332	0.02266	—	2,803.12
Dust From Material Movement	—	—	—	—	—	—	0.01585	0.01585	—	0.00240	0.00240	—	—	—	—	—	—	—
Onsite truck	0.01543	0.00353	0.14220	0.09645	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	87.5363	87.5363	0.01157	0.01411	0.14581	92.1761
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07519	0.06291	0.45653	0.58201	0.00149	0.01499	—	0.01499	0.01379	—	0.01379	—	153.070	153.070	0.00621	0.00124	—	153.595
Dust From Material Movement	—	—	—	—	—	—	0.00087	0.00087	—	0.00013	0.00013	—	—	—	—	—	—	—
Onsite truck	0.00083	0.00019	0.00811	0.00532	0.00004	0.00006	0.19815	0.19821	0.00006	0.01998	0.02004	—	4.79972	4.79972	0.00063	0.00077	0.00345	5.04942
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.01372	0.01148	0.08332	0.10622	0.00027	0.00274	—	0.00274	0.00252	—	0.00252	—	25.3425	25.3425	0.00103	0.00021	—	25.4295
Dust From Material Movement	—	—	—	—	—	—	0.00016	0.00016	—	0.00002	0.00002	—	—	—	—	—	—	—
Onsite truck	0.00015	0.00003	0.00148	0.00097	0.00001	0.00001	0.03616	0.03617	0.00001	0.00365	0.00366	—	0.79465	0.79465	0.00011	0.00013	0.00057	0.83599

3.1.2. Offsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08025	0.07893	0.06900	1.24164	0.00000	0.00000	0.26142	0.26142	0.00000	0.06128	0.06128	—	265.355	265.355	0.00309	0.00948	0.76287	269.020
Vendor	0.01648	0.00373	0.18024	0.09900	0.00135	0.00270	0.05134	0.05403	0.00135	0.01418	0.01553	—	174.488	174.488	0.01127	0.02669	0.38009	183.105
Hauling	0.07385	0.01036	0.74406	0.42439	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	649.743	649.743	0.06283	0.10428	1.16647	683.556
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00413	0.00406	0.00428	0.05426	0.00000	0.00000	0.01425	0.01425	0.00000	0.00334	0.00334	—	13.5267	13.5267	0.00019	0.00052	0.01809	13.7044
Vendor	0.00090	0.00020	0.01030	0.00547	0.00007	0.00015	0.00280	0.00295	0.00007	0.00077	0.00085	—	9.56357	9.56357	0.00062	0.00146	0.00898	10.0239
Hauling	0.00402	0.00056	0.04286	0.02331	0.00025	0.00048	0.01012	0.01060	0.00048	0.00277	0.00325	—	35.6088	35.6088	0.00344	0.00571	0.02757	37.4252
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00075	0.00074	0.00078	0.00990	0.00000	0.00000	0.00260	0.00260	0.00000	0.00061	0.00061	—	2.23950	2.23950	0.00003	0.00009	0.00299	2.26892
Vendor	0.00016	0.00004	0.00188	0.00100	0.00001	0.00003	0.00051	0.00054	0.00001	0.00014	0.00015	—	1.58336	1.58336	0.00010	0.00024	0.00149	1.65956
Hauling	0.00073	0.00010	0.00782	0.00425	0.00005	0.00009	0.00185	0.00193	0.00009	0.00051	0.00059	—	5.89544	5.89544	0.00057	0.00095	0.00456	6.19617

3.2. Grading (2028)

3.2.1. Onsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.96797	3.33337	20.1195	28.7473	0.08775	0.71447	—	0.71447	0.65731	—	0.65731	—	9,464.86	9,464.86	0.38394	0.07679	—	9,497.34
Dust From Material Movement	—	—	—	—	—	—	0.59376	0.59376	—	0.06687	0.06687	—	—	—	—	—	—	—
Onsite truck	0.01543	0.00353	0.14220	0.09645	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	87.5363	87.5363	0.01157	0.01411	0.14581	92.1761
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54356	0.45663	2.75609	3.93799	0.01202	0.09787	—	0.09787	0.09004	—	0.09004	—	1,296.56	1,296.56	0.05259	0.01052	—	1,301.01
Dust From Material Movement	—	—	—	—	—	—	0.08134	0.08134	—	0.00916	0.00916	—	—	—	—	—	—	—
Onsite truck	0.00208	0.00047	0.02028	0.01329	0.00009	0.00015	0.49537	0.49552	0.00015	0.04995	0.05010	—	11.9993	11.9993	0.00159	0.00193	0.00862	12.6235
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.09920	0.08333	0.50299	0.71868	0.00219	0.01786	—	0.01786	0.01643	—	0.01643	—	214.660	214.660	0.00871	0.00174	—	215.396
Dust From Material Movement	—	—	—	—	—	—	0.01484	0.01484	—	0.00167	0.00167	—	—	—	—	—	—	—
Onsite truck	0.00038	0.00009	0.00370	0.00243	0.00002	0.00003	0.09040	0.09043	0.00003	0.00912	0.00914	—	1.98662	1.98662	0.00026	0.00032	0.00143	2.08997

3.2.2. Offsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12840	0.12628	0.11041	1.98663	0.00000	0.00000	0.41827	0.41827	0.00000	0.09804	0.09804	—	424.567	424.567	0.00494	0.01517	1.22059	430.431
Vendor	0.01648	0.00373	0.18024	0.09900	0.00135	0.00270	0.05134	0.05403	0.00135	0.01418	0.01553	—	174.488	174.488	0.01127	0.02669	0.38009	183.105
Hauling	0.14771	0.02072	1.48812	0.84878	0.00926	0.01764	0.37080	0.38844	0.01764	0.10152	0.11916	—	1,299.49	1,299.49	0.12566	0.20856	2.33293	1,367.11
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01653	0.01624	0.01711	0.21706	0.00000	0.00000	0.05699	0.05699	0.00000	0.01335	0.01335	—	54.1068	54.1068	0.00077	0.00208	0.07235	54.8177
Vendor	0.00224	0.00049	0.02576	0.01367	0.00018	0.00037	0.00700	0.00737	0.00018	0.00193	0.00212	—	23.9089	23.9089	0.00154	0.00366	0.02244	25.0596
Hauling	0.02011	0.00278	0.21430	0.11657	0.00127	0.00242	0.05059	0.05300	0.00242	0.01385	0.01627	—	178.044	178.044	0.01721	0.02857	0.13785	187.126
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00302	0.00296	0.00312	0.03961	0.00000	0.00000	0.01040	0.01040	0.00000	0.00244	0.00244	—	8.95800	8.95800	0.00013	0.00034	0.01198	9.07569
Vendor	0.00041	0.00009	0.00470	0.00249	0.00003	0.00007	0.00128	0.00135	0.00003	0.00035	0.00039	—	3.95839	3.95839	0.00026	0.00061	0.00372	4.14891
Hauling	0.00367	0.00051	0.03911	0.02127	0.00023	0.00044	0.00923	0.00967	0.00044	0.00253	0.00297	—	29.4772	29.4772	0.00285	0.00473	0.02282	30.9808

3.3. Building Construction (2028)

3.3.1. Onsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.46966	2.06526	13.9124	16.8429	0.04948	0.48705	—	0.48705	0.44809	—	0.44809	—	5,028.64	5,028.64	0.20398	0.04080	—	5,045.90
Onsite truck	0.01543	0.00353	0.14220	0.09645	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	87.5363	87.5363	0.01157	0.01411	0.14581	92.1761
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.46966	2.06526	13.9124	16.8429	0.04948	0.48705	—	0.48705	0.44809	—	0.44809	—	5,028.64	5,028.64	0.20398	0.04080	—	5,045.90
Onsite truck	0.01499	0.00320	0.14881	0.09789	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	87.6760	87.6760	0.01157	0.01411	0.00378	92.1738
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.85544	0.71536	4.81896	5.83403	0.01714	0.16871	—	0.16871	0.15521	—	0.15521	—	1,741.82	1,741.82	0.07066	0.01413	—	1,747.80
Onsite truck	0.00527	0.00118	0.05128	0.03360	0.00023	0.00038	1.25257	1.25296	0.00038	0.12630	0.12668	—	30.3411	30.3411	0.00401	0.00489	0.02179	31.9195
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15612	0.13055	0.87946	1.06471	0.00313	0.03079	—	0.03079	0.02833	—	0.02833	—	288.378	288.378	0.01170	0.00234	—	289.368

Onsite truck	0.00096	0.00022	0.00936	0.00613	0.00004	0.00007	0.22859	0.22866	0.00007	0.02305	0.02312	—	5.02332	5.02332	0.00066	0.00081	0.00361	5.28464

3.3.2. Offsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20062	0.19731	0.17251	3.10411	0.00000	0.00000	0.65355	0.65355	0.00000	0.15319	0.15319	—	663.386	663.386	0.00772	0.02370	1.90717	672.549
Vendor	0.01648	0.00373	0.18024	0.09900	0.00135	0.00270	0.05134	0.05403	0.00135	0.01418	0.01553	—	174.488	174.488	0.01127	0.02669	0.38009	183.105
Hauling	0.07385	0.01036	0.74406	0.42439	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	649.743	649.743	0.06283	0.10428	1.16647	683.556
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19070	0.18629	0.17472	2.33414	0.00000	0.00000	0.65355	0.65355	0.00000	0.15319	0.15319	—	608.634	608.634	0.00882	0.02370	0.04957	615.967
Vendor	0.01622	0.00347	0.18815	0.10058	0.00135	0.00270	0.05134	0.05403	0.00135	0.01418	0.01553	—	174.599	174.599	0.01127	0.02669	0.00984	182.845
Hauling	0.07297	0.00970	0.77713	0.42726	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	650.023	650.023	0.06283	0.10428	0.03020	682.699
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06529	0.06415	0.06758	0.85756	0.00000	0.00000	0.22515	0.22515	0.00000	0.05276	0.05276	—	213.770	213.770	0.00305	0.00821	0.28586	216.579
Vendor	0.00566	0.00125	0.06514	0.03457	0.00047	0.00093	0.01770	0.01864	0.00047	0.00489	0.00536	—	60.4554	60.4554	0.00390	0.00925	0.05674	63.3651
Hauling	0.02543	0.00351	0.27094	0.14738	0.00160	0.00305	0.06395	0.06701	0.00305	0.01752	0.02057	—	225.098	225.098	0.02176	0.03612	0.17428	236.581
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01192	0.01171	0.01233	0.15651	0.00000	0.00000	0.04109	0.04109	0.00000	0.00963	0.00963	—	35.3921	35.3921	0.00051	0.00136	0.04733	35.8571
Vendor	0.00103	0.00023	0.01189	0.00631	0.00009	0.00017	0.00323	0.00340	0.00009	0.00089	0.00098	—	10.0091	10.0091	0.00065	0.00153	0.00939	10.4908
Hauling	0.00464	0.00064	0.04945	0.02690	0.00029	0.00056	0.01167	0.01223	0.00056	0.00320	0.00375	—	37.2676	37.2676	0.00360	0.00598	0.02885	39.1686

3.4. Building Construction (2029)

3.4.1. Onsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.42025	2.02398	13.2787	16.7146	0.04949	0.45458	—	0.45458	0.41821	—	0.41821	—	5,029.78	5,029.78	0.20403	0.04081	—	5,047.04
Onsite truck	0.01422	0.00320	0.14473	0.09601	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	85.6168	85.6168	0.01080	0.01356	0.00345	89.9308
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.28891	0.24161	1.58513	1.99529	0.00591	0.05426	—	0.05426	0.04992	—	0.04992	—	600.423	600.423	0.02436	0.00487	—	602.484
Onsite truck	0.00172	0.00041	0.01717	0.01136	0.00008	0.00013	0.43168	0.43181	0.00013	0.04353	0.04366	—	10.2105	10.2105	0.00129	0.00162	0.00686	10.7320
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05273	0.04409	0.28929	0.36414	0.00108	0.00990	—	0.00990	0.00911	—	0.00911	—	99.4069	99.4069	0.00403	0.00081	—	99.7481
Onsite truck	0.00031	0.00007	0.00313	0.00207	0.00001	0.00002	0.07878	0.07881	0.00002	0.00794	0.00797	—	1.69047	1.69047	0.00021	0.00027	0.00114	1.77680

3.4.2. Offsite - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18078	0.15598	0.17361	2.18533	0.00000	0.00000	0.65355	0.65355	0.00000	0.15319	0.15319	—	597.728	597.728	0.00772	0.02370	0.04403	605.027
Vendor	0.01474	0.00347	0.17900	0.09601	0.00135	0.00135	0.05134	0.05268	0.00135	0.01418	0.01553	—	170.029	170.029	0.01114	0.02534	0.00866	177.868
Hauling	0.06812	0.00970	0.74913	0.41359	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	634.152	634.152	0.05798	0.09987	0.02762	665.390
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02145	0.01862	0.02072	0.27535	0.00000	0.00000	0.07760	0.07760	0.00000	0.01818	0.01818	—	72.3508	72.3508	0.00092	0.00283	0.08772	73.3047
Vendor	0.00177	0.00043	0.02152	0.01140	0.00016	0.00016	0.00610	0.00626	0.00016	0.00169	0.00185	—	20.2891	20.2891	0.00133	0.00303	0.01723	21.2412
Hauling	0.00818	0.00121	0.09001	0.04916	0.00055	0.00105	0.02204	0.02309	0.00105	0.00604	0.00709	—	75.6813	75.6813	0.00692	0.01192	0.05487	79.4619
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00391	0.00340	0.00378	0.05025	0.00000	0.00000	0.01416	0.01416	0.00000	0.00332	0.00332	—	11.9785	11.9785	0.00015	0.00047	0.01452	12.1364
Vendor	0.00032	0.00008	0.00393	0.00208	0.00003	0.00003	0.00111	0.00114	0.00003	0.00031	0.00034	—	3.35910	3.35910	0.00022	0.00050	0.00285	3.51672
Hauling	0.00149	0.00022	0.01643	0.00897	0.00010	0.00019	0.00402	0.00421	0.00019	0.00110	0.00129	—	12.5299	12.5299	0.00115	0.00197	0.00908	13.1558

3.5. Paving (2029)

3.5.1. Onsite - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.60418	0.50677	4.86652	7.15521	0.01045	0.19810	—	0.19810	0.18225	—	0.18225	—	1,096.25	1,096.25	0.04447	0.00889	—	1,100.02
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.01466	0.00353	0.13801	0.09458	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	85.4742	85.4742	0.01080	0.01356	0.13320	89.9179
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.60418	0.50677	4.86652	7.15521	0.01045	0.19810	—	0.19810	0.18225	—	0.18225	—	1,096.25	1,096.25	0.04447	0.00889	—	1,100.02
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.01422	0.00320	0.14473	0.09601	0.00066	0.00110	3.70095	3.70205	0.00110	0.37309	0.37419	—	85.6168	85.6168	0.01080	0.01356	0.00345	89.9308
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06952	0.05831	0.55998	0.82334	0.00120	0.02280	—	0.02280	0.02097	—	0.02097	—	126.144	126.144	0.00512	0.00102	—	126.577
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00166	0.00039	0.01655	0.01095	0.00008	0.00013	0.41611	0.41624	0.00013	0.04196	0.04208	—	9.84229	9.84229	0.00124	0.00156	0.00661	10.3449
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01269	0.01064	0.10220	0.15026	0.00022	0.00416	—	0.00416	0.00383	—	0.00383	—	20.8846	20.8846	0.00085	0.00017	—	20.9563
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00030	0.00007	0.00302	0.00200	0.00001	0.00002	0.07594	0.07596	0.00002	0.00766	0.00768	—	1.62950	1.62950	0.00021	0.00026	0.00109	1.71272

3.5.2. Offsite - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06102	0.05997	0.04833	0.92788	0.00000	0.00000	0.20914	0.20914	0.00000	0.04902	0.04902	—	208.438	208.438	0.00212	0.00758	0.54497	211.295
Vendor	0.01500	0.00373	0.17244	0.09468	0.00135	0.00135	0.05134	0.05268	0.00135	0.01418	0.01553	—	169.916	169.916	0.01114	0.02534	0.33379	178.081
Hauling	0.06900	0.01036	0.71584	0.41072	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	633.866	633.866	0.05798	0.09987	1.06558	666.142
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05785	0.04991	0.05556	0.69931	0.00000	0.00000	0.20914	0.20914	0.00000	0.04902	0.04902	—	191.273	191.273	0.00247	0.00758	0.01409	193.609
Vendor	0.01474	0.00347	0.17900	0.09601	0.00135	0.00135	0.05134	0.05268	0.00135	0.01418	0.01553	—	170.029	170.029	0.01114	0.02534	0.00866	177.868
Hauling	0.06812	0.00970	0.74913	0.41359	0.00463	0.00882	0.18540	0.19422	0.00882	0.05076	0.05958	—	634.152	634.152	0.05798	0.09987	0.02762	665.390
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00662	0.00574	0.00639	0.08493	0.00000	0.00000	0.02394	0.02394	0.00000	0.00561	0.00561	—	22.3173	22.3173	0.00028	0.00087	0.02706	22.6115
Vendor	0.00171	0.00041	0.02074	0.01099	0.00016	0.00016	0.00588	0.00604	0.00016	0.00163	0.00178	—	19.5574	19.5574	0.00128	0.00292	0.01661	20.4751
Hauling	0.00789	0.00117	0.08676	0.04739	0.00053	0.00101	0.02125	0.02226	0.00101	0.00582	0.00683	—	72.9518	72.9518	0.00667	0.01149	0.05289	76.5961
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00121	0.00105	0.00117	0.01550	0.00000	0.00000	0.00437	0.00437	0.00000	0.00102	0.00102	—	3.69488	3.69488	0.00005	0.00014	0.00448	3.74359
Vendor	0.00031	0.00008	0.00379	0.00201	0.00003	0.00003	0.00107	0.00110	0.00003	0.00030	0.00032	—	3.23795	3.23795	0.00021	0.00048	0.00275	3.38989
Hauling	0.00144	0.00021	0.01583	0.00865	0.00010	0.00019	0.00388	0.00406	0.00019	0.00106	0.00125	—	12.0780	12.0780	0.00110	0.00190	0.00876	12.6814

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.30178	2.30178	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.27325	0.27325	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.83278	0.76857	0.03936	4.67803	0.00028	0.00831	—	0.00831	0.00628	—	0.00628	—	19.2367	19.2367	0.00081	0.00017	—	19.3061
Total	3.40781	3.34361	0.03936	4.67803	0.00028	0.00831	—	0.00831	0.00628	—	0.00628	—	19.2367	19.2367	0.00081	0.00017	—	19.3061
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	2.30178	2.30178	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.27325	0.27325	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	2.57504	2.57504	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.42008	0.42008	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	0.04987	0.04987	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.10410	0.09607	0.00492	0.58475	0.00003	0.00104	—	0.00104	0.00079	—	0.00079	—	2.18141	2.18141	0.00009	0.00002	—	2.18928
Total	0.57404	0.56602	0.00492	0.58475	0.00003	0.00104	—	0.00104	0.00079	—	0.00079	—	2.18141	2.18141	0.00009	0.00002	—	2.18928

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Total	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Total	—	—	—	—	—	—	—	—	—	—	—	71.8806	0.00000	71.8806	7.18421	0.00000	—	251.486
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Heavy Industry	—	—	—	—	—	—	—	—	—	—	—	11.9007	0.00000	11.9007	1.18943	0.00000	—	41.6364
Total	—	—	—	—	—	—	—	—	—	—	—	11.9007	0.00000	11.9007	1.18943	0.00000	—	41.6364

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

Land Use	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Construction Equipment	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Total	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Construction Equipment	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Total	0.08651	0.07270	0.71648	1.06074	0.00148	0.03503	—	0.03503	0.03223	—	0.03223	—	160.018	160.018	0.00649	0.00130	—	160.567
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Construction Equipment	0.01125	0.00945	0.09314	0.13790	0.00019	0.00455	—	0.00455	0.00419	—	0.00419	—	18.8716	18.8716	0.00077	0.00015	—	18.9364
Total	0.01125	0.00945	0.09314	0.13790	0.00019	0.00455	—	0.00455	0.00419	—	0.00419	—	18.8716	18.8716	0.00077	0.00015	—	18.9364

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

Equipment Type	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

Equipment Type	TOG	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. 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	TOG	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	TOG	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	TOG	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Clearing and Grubbing	Site Preparation	4/1/2028	4/29/2028	5.00000	20.0000	—
Grading	Grading	5/1/2028	7/7/2028	5.00000	50.0000	—
Building Construction	Building Construction	7/8/2028	3/2/2029	5.00000	170.000	—
Paving	Paving	3/3/2029	5/1/2029	5.00000	42.0000	—

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
Clearing and Grubbing	Tractors/Loaders/Backhoes	Diesel	Average	1.000000	9.00000	84.0000	0.37000

Clearing and Grubbing	Skid Steer Loaders	Diesel	Average	1.000000	9.00000	71.0000	0.37000
Clearing and Grubbing	Excavators	Diesel	Average	2.00000	6.00000	36.0000	0.38000
Clearing and Grubbing	Generator Sets	Diesel	Average	3.00000	8.00000	14.0000	0.74000
Clearing and Grubbing	Off-Highway Trucks	Diesel	Average	2.00000	5.00000	376.000	0.38000
Grading	Off-Highway Trucks	Diesel	Average	2.00000	5.00000	376.000	0.38000
Grading	Off-Highway Trucks	Diesel	Average	6.00000	6.00000	376.000	0.38000
Grading	Graders	Diesel	Average	1.000000	8.00000	148.000	0.41000
Grading	Excavators	Diesel	Average	2.00000	9.00000	36.0000	0.38000
Grading	Skid Steer Loaders	Diesel	Average	1.000000	9.00000	71.0000	0.37000
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00000	8.00000	84.0000	0.37000
Grading	Plate Compactors	Diesel	Average	3.00000	4.00000	8.00000	0.43000
Building Construction	Off-Highway Trucks	Diesel	Average	2.00000	8.00000	376.000	0.38000
Building Construction	Other Construction Equipment	Diesel	Average	1.000000	8.00000	82.0000	0.42000
Building Construction	Cranes	Diesel	Average	1.000000	4.00000	367.000	0.29000
Building Construction	Air Compressors	Diesel	Average	2.00000	4.00000	37.0000	0.48000
Building Construction	Generator Sets	Diesel	Average	3.00000	8.00000	14.0000	0.74000
Building Construction	Off-Highway Trucks	Diesel	Average	1.000000	4.00000	376.000	0.38000
Building Construction	Concrete/Industrial Saws	Diesel	Average	2.00000	4.00000	33.0000	0.73000
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.000000	4.00000	84.0000	0.37000
Paving	Cement and Mortar Mixers	Diesel	Average	1.000000	8.00000	10.00000	0.56000
Paving	Pavers	Diesel	Average	1.000000	8.00000	81.0000	0.42000
Paving	Paving Equipment	Diesel	Average	1.000000	8.00000	89.0000	0.36000
Paving	Rollers	Diesel	Average	1.000000	6.00000	36.0000	0.38000
Paving	Other Construction Equipment	Diesel	Average	1.000000	8.00000	82.0000	0.42000

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Clearing and Grubbing	Worker	20.0000	18.5000	LDA,LDT1,LDT2
Clearing and Grubbing	Vendor	6.00000	10.2000	HHDT,MHDT
Clearing and Grubbing	Hauling	10.00000	20.0000	HHDT
Clearing and Grubbing	Onsite truck	5.00000	5.00000	HHDT
Grading	Worker	32.0000	18.5000	LDA,LDT1,LDT2
Grading	Vendor	6.00000	10.2000	HHDT,MHDT
Grading	Hauling	20.0000	20.0000	HHDT
Grading	Onsite truck	5.00000	5.00000	HHDT
Building Construction	Worker	50.0000	18.5000	LDA,LDT1,LDT2
Building Construction	Vendor	6.00000	10.2000	HHDT,MHDT
Building Construction	Hauling	10.00000	20.0000	HHDT
Building Construction	Onsite truck	5.00000	5.00000	HHDT
Paving	Worker	16.0000	18.5000	LDA,LDT1,LDT2
Paving	Vendor	6.00000	10.2000	HHDT,MHDT
Paving	Hauling	10.00000	20.0000	HHDT
Paving	Onsite truck	5.00000	5.00000	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Clearing and Grubbing	300.000	6,800.00	0.00000	0.00000	0.00000
Grading	61,720.0	9,400.00	25.0000	0.00000	0.00000
Paving	0.00000	0.00000	0.00000	0.00000	0.00000

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Phase Name	Land Use	Area Paved (acres)	% Asphalt
Paving	General Heavy Industry	0.00000	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2028	0.00000	531.983	0.03300	0.00400
2029	0.00000	531.983	0.03300	0.00400

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	4.00000	4.00000	4.00000	1,460.00	80.0000	80.0000	80.0000	29,200.0

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
General Heavy Industry	Wood Fireplaces	0	0
General Heavy Industry	Gas Fireplaces	0	0
General Heavy Industry	Propane Fireplaces	0	0
General Heavy Industry	Electric Fireplaces	0	0
General Heavy Industry	No Fireplaces	0	0
General Heavy Industry	Conventional Wood Stoves	0	0
General Heavy Industry	Catalytic Wood Stoves	0	0
General Heavy Industry	Non-Catalytic Wood Stoves	0	0
General Heavy Industry	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

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)
0.00000	0.00000	161,340	53,780.0	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	250.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Heavy Industry	0.00000	0.00000

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Heavy Industry	133.374	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Other Construction Equipment	Diesel	Average	1.000000	4.00000	82.0000	0.42000

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

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	27.6400	annual days of extreme heat
Extreme Precipitation	6.20000	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	14.7000	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	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2

Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
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	100.0000
AQ-PM	55.6192
AQ-DPM	10.0933
Drinking Water	44.1114
Lead Risk Housing	87.6244
Pesticides	0.00000
Toxic Releases	58.3896
Traffic	22.0625
Effect Indicators	—
CleanUp Sites	77.3236
Groundwater	0.00000

Haz Waste Facilities/Generators	35.6188
Impaired Water Bodies	0.00000
Solid Waste	0.00000
Sensitive Population	—
Asthma	82.0788
Cardio-vascular	91.7996
Low Birth Weights	30.8442
Socioeconomic Factor Indicators	—
Education	83.4472
Housing	69.1508
Linguistic	25.5515
Poverty	88.3668
Unemployment	90.3306

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	10.8045682
Employed	11.03554472
Median HI	13.7046067
Education	—
Bachelor's or higher	17.77235981
High school enrollment	23.00782754
Preschool enrollment	45.13024509
Transportation	—
Auto Access	30.77120493
Active commuting	60.20787887

Social	—
2-parent households	5.389452072
Voting	19.24804312
Neighborhood	—
Alcohol availability	27.678686
Park access	13.8842551
Retail density	21.2498396
Supermarket access	45.23290132
Tree canopy	30.92518927
Housing	—
Homeownership	26.63929167
Housing habitability	20.67239831
Low-inc homeowner severe housing cost burden	43.82137816
Low-inc renter severe housing cost burden	11.13820095
Uncrowded housing	17.2334146
Health Outcomes	—
Insured adults	22.85384319
Arthritis	40.2
Asthma ER Admissions	13.4
High Blood Pressure	46.3
Cancer (excluding skin)	77.2
Asthma	3.1
Coronary Heart Disease	57.7
Chronic Obstructive Pulmonary Disease	9.6
Diagnosed Diabetes	38.1
Life Expectancy at Birth	22.1
Cognitively Disabled	13.7
Physically Disabled	38.4

Heart Attack ER Admissions	17.0
Mental Health Not Good	7.3
Chronic Kidney Disease	55.3
Obesity	14.7
Pedestrian Injuries	48.6
Physical Health Not Good	15.2
Stroke	26.0
Health Risk Behaviors	—
Binge Drinking	55.6
Current Smoker	4.4
No Leisure Time for Physical Activity	20.7
Climate Change Exposures	—
Wildfire Risk	81.1
SLR Inundation Area	0.0
Children	7.3
Elderly	86.3
English Speaking	56.6
Foreign-born	36.0
Outdoor Workers	25.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	78.3
Traffic Density	26.9
Traffic Access	23.0
Other Indices	—
Hardship	88.7
Other Decision Support	—
2016 Voting	10.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	67.0000
Healthy Places Index Score for Project Location (b)	9.00000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
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

8.1. Justifications

Screen	Justification
Construction: Construction Phases	April 2028 to May 2029
Construction: Off-Road Equipment	DR1 Responses
Construction: Trips and VMT	Based on DR1
Construction: On-Road Fugitive Dust	Estimated
Operations: Energy Use	no energy use
Operations: Water and Waste Water	no indoor water use
Operations: Refrigerants	No AC

Operations: Off-Road Equipment	Occasional hand tools or light equipment for vegetation management

8.4. Construction

8.4.1. Construction Phases

Phase Type	Phase Name	Model Parameter	Default Value	New Value
Grading	Grading	Start Date	5/5/2028	5/1/2028
Grading	Grading	End Date	5/13/2028	7/7/2028
Grading	Grading	Work Days per Phase	6.00000	50.0000
Building Construction	Building Construction	Start Date	5/14/2028	7/8/2028
Building Construction	Building Construction	End Date	3/18/2029	3/2/2029
Building Construction	Building Construction	Work Days per Phase	220.000	170.000
Paving	Paving	Start Date	3/19/2029	3/3/2029
Paving	Paving	End Date	4/2/2029	5/1/2029
Paving	Paving	Work Days per Phase	10.00000	42.0000

8.4.2. Off-Road Equipment

Phase Name	Equipment Type	Model Parameter	Default Value	New Value
Clearing and Grubbing	Tractors/Loaders/Backhoes	Hours Per Day	7.00000	9.00000
Clearing and Grubbing	Skid Steer Loaders	Hours Per Day	8.00000	9.00000
Clearing and Grubbing	Excavators	Number per Day	1.000000	2.00000
Clearing and Grubbing	Excavators	Hours Per Day	8.00000	6.00000
Clearing and Grubbing	Generator Sets	Number per Day	1.000000	3.00000
Clearing and Grubbing	Off-Highway Trucks	Number per Day	1.000000	2.00000
Clearing and Grubbing	Off-Highway Trucks	Hours Per Day	8.00000	5.00000
Paving	Rollers	Number per Day	2.00000	1.000000
Paving	Rollers	Hours Per Day	8.00000	6.00000

8.4.6. Trips and VMT

Phase Name	Trip Type	Model Parameter	Default Value	New Value
Clearing and Grubbing	Worker	One-Way Trips per Day	22.5000	20.0000
Clearing and Grubbing	Hauling	One-Way Trips per Day	44.4000	10.00000
Grading	Worker	One-Way Trips per Day	42.5000	32.0000
Grading	Hauling	One-Way Trips per Day	177.800	20.0000
Building Construction	Worker	One-Way Trips per Day	45.1752	50.0000
Building Construction	Vendor	One-Way Trips per Day	17.6291	6.00000
Building Construction	Hauling	One-Way Trips per Day	0.00000	10.00000
Paving	Worker	One-Way Trips per Day	12.5000	16.0000
Paving	Hauling	One-Way Trips per Day	0.00000	10.00000

8.4.7. On-Road Fugitive Dust

Phase Name	Model Parameter	Units	Default Value	New Value
Clearing and Grubbing	Onsite Truck Trip Paved	%	0.00000	90.0000
Grading	Onsite Truck Trip Paved	%	0.00000	90.0000
Building Construction	Onsite Truck Trip Paved	%	0.00000	90.0000
Paving	Onsite Truck Trip Paved	%	0.00000	90.0000

8.5. Operations

8.5.4. Water and Waste Water

Land Use	Model Parameter	Units	Default Value	New Value
General Heavy Industry	Indoor Water	gal/year	24,873,250	0.00000

8.5.7. Off-Road Equipment

8.5.7.1. Off-Road Equipment

Equipment Type	Model Parameter	Default Value	New Value
Other Construction Equipment	Hours/Day	8.00000	4.00000

Appendix B

Biological Resources Technical Report

BIOLOGICAL RESOURCES TECHNICAL REPORT

North San Bernardino Channel Project

Prepared for

San Bernardino County
Flood Control District

Submitted by

Aspen environmental group

September 2026

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1. INTRODUCTION

This report presents the methods and results of biological surveys conducted by Aspen Environmental Group (Aspen) on behalf of the San Bernardino County Flood Control District (District). These surveys were completed to support the District's North San Bernardino Channel Project (Proposed Project or Project) which will construct a concrete rectangular channel to replace the existing rural interim channel. This report provides baseline information on biological resources to support the District's environmental review of the Proposed Project and Project permitting. Throughout this report Project area includes all areas that may be impacted by Project activities. Project vicinity is used to define an area of approximately five miles surrounding the Project area.

1.1. Project Location

The Project area is located at the North San Bernardino Channel (formerly known as Devil Creek Channel), just north of Kendall Drive, from Western Avenue to Little Mountain Basin (approximately one mile), in the City of San Bernardino, San Bernardino County, California (Figure 1, Attachment 1).

The Project is located in the San Bernardino North U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Elevation of the Project area ranges from approximately 1,325 to 1,400 feet (400 to 425 meters) above mean sea level (amsl). The Project site is heavily disturbed and frequently experiences graffiti, illegal dumping, trash accumulation, and unauthorized encampment activity. Surrounding lands are dense residential developments to the north, west, and east, with approximately 1,000 acres of natural open space at Little Mountain to the south. Interstate 215 is located approximately one mile west and State Route 210 is located approximately 1.5 miles south. California State University, San Bernardino is located approximately one mile northwest of the Project site. The Project area is situated approximately two miles southwest of the San Bernardino Mountains and 3.5 miles east of Lytle Creek.

1.2. Project Description

The District proposes to construct an 8-foot-high reinforced concrete rectangular channel to replace the existing channel and three street crossings/culverts, as well as the relocation of various utilities (primarily at the street crossings). The existing rural and interim channel was constructed in the 1950s and intended to be a temporary flood control channel designed for flood protection during 25-year events upstream and 10-year events downstream. The channel improvements aim to increase flood protection to a uniform 100-year event protection, enhance protection for areas within the 100-year floodplain, and mitigate flooding risks for nearly 300 structures and over 200,000 residents.

2. REGULATORY FRAMEWORK

2.1. Federal Regulations

2.1.1. Endangered Species Act

The Federal Endangered Species Act (FESA) and its subsequent amendments protect plants and wildlife listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS). The FESA also provides for the designation of critical habitat, which is defined as the specific areas within the geographical range occupied by a listed species that possess the physical or biological features essential for the conservation of the species and that may require special management protection. Section 9 of the FESA specifically prohibits the taking of FESA-protected wildlife and lists prohibited actions. The FESA defines take 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). The FESA also governs the removal, possession, malicious damage, or destruction of

endangered plants on federal land. Pursuant to the requirements of the FESA, an agency proposing a project or reviewing a proposed project within its jurisdiction (action agency) must determine whether any federally listed species may be present in the proposed project area and determine whether the proposed project will have a significant effect upon such species or its habitat.

2.1.2. Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations to protect migratory birds and their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized by regulation or permit. Regulations governing migratory bird permits are found in 50 CFR 13 – General Permit Procedures and 50 CFR 21 – Migratory Bird Permits.

2.1.3. Bald and Golden Eagle Protection Act

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA), originally passed in 1940 and amended in 1962. The BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, egg, unless allowed by permit (15 U.S.C. 668[a]; 50 CFR 22). The USFWS regulates activities that may take bald eagles or golden eagles. Take is defined as "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing" bald or golden eagles, and as activities causing: "(1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (USFWS, 2007).

2.2. State Regulations

2.2.1. California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires state agencies, local governments, and special districts to evaluate and disclose impacts from projects in the state. Section 15380 of the CEQA Guidelines clearly indicates that plant and wildlife species designated by the California Department of Fish and Wildlife (CDFW) as Fully Protected (FP) or Species of Special Concern (SSC) should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

2.2.2. California Endangered Species Act

The California Endangered Species Act (CESA) provides that certain species of plants and wildlife that are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of California are of statewide concern and should be conserved, protected, and enhanced along with their habitats. The CESA establishes policy that state agencies should not approve projects that would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives consistent with conserving the species or its habitat that would prevent jeopardy.

2.2.3. Fully Protected Designations

California Fish and Game Code (FGC) Sections 3511, 4700, 5050, and 5515 designate 36 fish and wildlife species as FP from take, including hunting, harvesting, and other activities. The FGC sections dealing with FP species state that these species "…may not be taken or possessed at any time and no provisions of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species." Most of the species on these lists have been subsequently listed under the FESA or CESA.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of FP species, where pursuant to a Natural Community Conservation Plan (NCCP), approved by CDFW. The legislation gives FP species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species.

California Senate Bill 147 (signed by Governor Newsom July 2023) amends 3511, 4700, 5050, and 5515 and Section 395, and adds Section 2081.15 to the FGC. Fish and Game Commission is required to establish a list of endangered species and a list of threatened species and to add or remove species if the action is warranted. "The act prohibits the taking of endangered or threatened species, except in certain situations, including, if specific conditions are met, through the issuance of a permit commonly known as an incidental take permit." CDFW is authorized to issue a permit under CESA that would authorize the take of FP species resulting from impact attributable to the implementation of specified projects if certain conditions are met. This remains in effect until December 31, 2033. Furthermore, the bill removes the American peregrine falcon, brown pelican, and thicktail chub as FP species.

2.2.4. Native Bird Protections

FGC Sections 3503, 3503.3, and 3513 prohibit take, possession, or needless destruction of birds, nests, or eggs except as otherwise provided by the FGC. Section 3513 provides for the adoption of MBTA's provisions.

2.2.5. Furbearing Mammal Protections

FGC Section 251.1 prohibits the harassment of any furbearing mammal. Harass is defined as an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering.

2.2.6. California Code of Regulations Title 14

Title 14 Cal. Code of Regulations § 460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time. Cal. Code Regs. Tit. 14, § 362 - Nelson Bighorn Sheep regulates the taking of Nelsons Bighorn Sheep.

2.2.7. California Native Plant Protection Act

The California Native Plant Protection Act (CNPPA) of 1977 (FGC Sections 1900-1913) was created with the intent to "preserve, protect, and enhance rare and endangered plants in California." The CNPPA is administered by CDFW while the Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take.

2.3. Local Regulations

2.3.1. City of San Bernardino General Plan

The City of San Bernardino County General Plan Natural Resources and Conservation Element establishes goals and policies to maintain, improve, and preserve the quality and supply of the City's natural resources (City of San Bernardino, 2005), including:

- **Goal 12.1:** Conserve and enhance San Bernardino's biological resources.
  - **Policy 12.1.1:** Acquire and maintain current information regarding the status and location of sensitive biological elements (species and natural communities) within the planning area, as shown on Figure NRC-1.
  - **Policy 12.1.2:** Site and develop land uses in a manner that is sensitive to the unique characteristics of and that minimizes the impacts upon sensitive biological resources.

- **Policy 12.1.3:** Require that all proposed land uses in the "Biological Resource Management Area" (BRM) be subject to review by the Environmental Review Committee (ERC).
- **Policy 12.1.4:** Require that development in the BRM: a. Submit a report prepared by a qualified professional(s) that addresses the proposed project's impact on sensitive species and habitat, especially those that are identified in State and Federal conservation programs; b. Identify mitigation measures necessary to eliminate significant adverse impacts to sensitive biological resources; c. Define a program for monitoring, evaluating the effectiveness of, and ensuring the adequacy of the specified mitigation measures; and d. Discuss restoration of significant habitats.

■ **Goal 12.2 Protect riparian corridors to provide habitat for fish and wildlife.**

- **Policy 12.2.1:** Prohibit development and grading within fifty (50) feet of riparian corridors, as identified by a qualified biologist, unless no feasible alternative exists.
- **Policy 12.2.2:** Generally permit the following uses within riparian corridors: a. Education and research, excluding buildings and other structures; b. Passive (non mechanized) recreation; c. Trails and scenic overlooks on public land(s); d. Fish and wildlife management activities; e. Necessary water supply projects; f. Resource consumptive uses as provided for in the Fish and Game Code and Title 14 of the California Administrative Code; g. Flood control projects where no other methods are available to protect the public safety; h. Bridges and pipelines when supports are not in significant conflict with corridor resources.
- **Policy 12.2.3:** Pursue voluntary open space or conservation easements to protect sensitive species or their habitats.
- **Policy 12.2.4:** Development adjacent to riparian corridors shall: a. Minimize removal of vegetation; b. Minimize erosion, sedimentation, and runoff by appropriate protection or vegetation and landscape; c. Provide for sufficient passage of native and anadromous fish as specified by the California Department of Fish and Game; d. Minimize wastewater discharges and entrapment; e. Prevent groundwater depletion or substantial interference with surface and subsurface flows; and provide for natural vegetation buffers.
- **Policy 12.2.5:** Permit modification of the boundaries of the designated riparian corridors based on field research and aerial interpretation data as part of biological surveys.

■ **Goal 12.3:** Establish open space corridors between and to protected wildlands.

- **Policy 12.3.1:** Identify areas and formulate recommendations for the acquisition of property, including funding, to establish a permanent corridor contiguous to the National Forest via Cable Creek and/or Devil Canyon. The City shall consult with various federal, state and local agencies and City departments prior to the adoption of any open space corridor plan.
- **Policy 12.3.2:** Seek to acquire real property rights of open space corridor parcels identified as being suitable for acquisition.
- **Policy 12.3.3:** Establish the following habitat types as high-priority for acquisition as funds are available: a. Habitat of endangered species; b. Alluvial scrub vegetation; c. Riparian vegetation dominated by willow, alder, sycamore, or native oaks; and d. Native walnut woodlands.
- **Policy 12.3.4:** Preserve and enhance the natural characteristics of the Santa Ana River, City Creek, and Cajon Creek as habitat areas.
- **Policy 12.3.5:** Prevent further loss of existing stands of Santa Ana River Wooly-star (*Eriastrum densifolium sanctorum*) and Slender-horned centrostegia (*Centrostegia leptoceras*).

2.3.2. San Bernardino County General Plan

The San Bernardino County General Plan Natural Resources Element, NR-5 Biological Resources, establishes policies to preserve and protect biological resources (San Bernardino County, 2022), including:

- **Policy NR-5.1 Coordinated habitat planning**: Participate in landscape-scale habitat conservation planning and coordinate with existing or proposed habitat conservation and natural resource management plans for private and public lands to increase certainty for both the conservation of species, habitats, wildlife corridors, and other important biological resources and functions; and for land development and infrastructure permitting.
- **Policy NR-5.2 Capacity for resource protection and management**: Coordinate with public and nongovernmental agencies to seek funding and other resources to protect, restore, and maintain open space, habitat, and wildlife corridors for threatened, endangered, and other sensitive species.
- **Policy NR-5.3 Multiple-resource benefits**: Prioritize conservation actions that demonstrate multiple resource preservation benefits, such as biology, climate change adaptation and resiliency, hydrology, cultural, scenic, and community character.
- **Policy NR-5.4 Off-base recovery efforts**: Coordinate with military installations to facilitate off-base recovery of threatened and endangered species and landscape-scale conservation.
- **Policy NR-5.5 Mitigation and future responsibilities**: Require that new development satisfy habitat conservation responsibilities without shifting conservation responsibilities onto military property.
- **Policy NR-5.6 Mitigation banking**: Support the proactive assemblage of lands to protect biological resources and facilitate development through private or public mitigation banking. Require public and private conservation lands or mitigation banks to ensure that easement and fee title agreements provide funding methods sufficient to manage the land in perpetuity.
- **Policy NR-5.7 Development review, entitlement, and mitigation**: Comply with state and federal regulations regarding protected species of animals and vegetation through the development review, entitlement, and environmental clearance processes.
- **Policy NR-5.8 Invasive species**: Require the use of non-invasive plant species with new development and encourage the management of existing invasive plant species that degrade ecological function.

3. METHODS

3.1. Literature Review

Prior to the start of biological surveys, a literature review was conducted to identify special-status biological resources, including sensitive natural communities, known from the Project vicinity. This included a review of the CDFW California Natural Diversity Database (CNDDB) for the USGS 7.5-minute topographic quads where the Project area is located and the eight surrounding topographic quads including San Bernardino North, San Bernardino South, Cajon, Silverwood Lake, Lake Arrowhead, Harrison Mountain, Redlands, Fontana, and Devore (CDFW 2026a). The USFWS Information for Planning and Consultation (IPaC) program was also reviewed to identify federally listed species with a potential to be present in the Project vicinity (USFWS, 2026a). Additional data regarding the potential occurrence of special-status biological resources was obtained from the following sources:

- CDFW Sensitive Natural Communities (CDFW, 2026b)
- CDFW Special Animals List (CDFW, 2026c)

- California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2026)
- Consortium of California Herbaria (CCH) records for plants in the vicinity of the Project area (CCH, 2026)
- iNaturalist observations of special-status species observed within the vicinity of the Project area (iNaturalist, 2026)
- eBird observations of special-status birds documented within the vicinity of the Project area (eBird, 2026)

The results of the CNDDB and IPaC searches can be found in Attachment 2.

3.2. Field Surveys

Aspen biologists Jacob Aragon, Emily Correia-Lambton, and Keziah Robles conducted biological surveys of the Project area on May 7, 2026. The surveys involved walking all accessible portions of the site to assess the potential for special-status species to be present within the Proposed Project area, document plant and wildlife species, and to map vegetation communities. All observed species were recorded in field notes, and locations of any special-status species were documented using high-accuracy Global Positioning System (GPS) units. A complete list of plant and wildlife species observed during the surveys are provided in Attachment 3, and representative site photographs are included in Attachment 4.

Wildlife surveys included the identification of species through direct observation and diagnostic sign (e.g., vocalizations, tracks, scat, nests, skeletal remains, and burrows), as well as the evaluation of habitat features such as rock piles, cavities, and outcrops that may support special-status species.

Rainfall: Average annual rainfall recorded at the San Bernardino weather station, located within the region, is 16.4 inches (U.S Climate Data, 2026). Seasonal rainfall variability is extremely high. The average annual high temperature is 80 degrees Fahrenheit (°F), and the average annual low temperature is 52°F (U.S Climate Data, 2026). Rainfall during the 2023/2024 season was above average across much of Southern California, whereas the 2024/2025 season was below average.

3.3. Vegetation Mapping

Mapping was conducted to identify vegetation communities within the Project area. Vegetation maps were prepared by drawing tentative vegetation type boundaries onto high-resolution aerial images in the field on tablets using a high-accuracy GPS unit and an iPad with the ESRI Field Maps application. Vegetation descriptions and names are based on nomenclature used in *A Manual of California Vegetation* (Sawyer et al., 2009). Some areas, such as locations dominated by disturbed/developed habitat or locations that support little to no vegetation do not fall within communities described within *A Manual of California Vegetation*. The minimum mapping unit used for this Project was 0.10-acres.

3.4. Botanical Surveys

Botanical surveys were performed by Aspen biologist Jacob Aragon, Emily Correia-Lambton, and Keziah Robles on May 7, 2026. Surveys were conducted according to the most recent CDFW survey protocols (CDFW 2018) and were: (a) floristic in nature; (b) consistent with conservation ethics; (c) inclusive of all habitat types within the Project area; and (d) well documented by this report and by voucher specimens to be deposited at the California Botanic Garden (formerly Rancho Santa Ana Botanic Garden). The surveys were performed during the time of year when most species would be detectable.

Annual rainfall during the 2024/2025 water year was below average, which may have limited the germination of rare annual species and the flowering of perennial herbs. As a result, some special-status plant species may not have been detectable during the survey period. All areas that were accessible were surveyed. The

Project area was inspected by walking parallel transects at 20-meter intervals with particular attention given to areas of suitable habitat for special-status plants. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Baldwin et al., (2012), the Jepson eFlora (2026), and other regional references. Representative site photos were captured during the surveys and are included in Attachment 4.

3.5. Burrowing Owl Habitat Assessment

A burrowing owl (*Athene cunicularia*) protocol-level habitat assessment was conducted in accordance with the CDFW survey guidelines (CDFG, 2012). The goal of the habitat assessment is to evaluate the presence of suitable burrowing owl habitat, including burrows, soil conditions, and vegetation structure. All observations of owl, sign (e.g., whitewash, pellets, feathers), and potential burrows were recorded and mapped.

Aspen biologist Jacob Aragon conducted the habitat assessment on May 7, 2026, and was assisted by Emily Correia-Lambton and Keziah Robles. The habitat assessment provided 100 percent visual coverage of all safely accessible areas within the Burrowing Owl Survey Buffer (Project area buffered by 150 meters) and was conducted by walking along parallel transects at 20-meter intervals. All potential burrows and signs of burrowing owl activity were recorded using ArcGIS Field Maps with a GPS unit providing sub-meter accuracy. The survey effort adhered to all applicable protocols to ensure consistency with CDFW requirements and to support accurate impact assessment and mitigation planning.

4. RESULTS

4.1. Vegetation

Vegetation mapping units, descriptions, and names are typically based on alliance level nomenclature in *A Manual of California Vegetation* (Sawyer et al., 2009); however, no stands of vegetation were present and only land cover types were mapped. The land cover data is presented in Table 2 and shown in Figure 2 (Attachment 1). All plants observed within the Project area are provided in Attachment 3 and representative photos are provided in Attachment 4.

Table 1. Vegetation and Land Cover in the Project Area

Vegetation and Land Cover Types[1]	Permanent Impact (Acres)	Temporary Impact (Acres)	Total Impact (Acres)
Disturbed/Developed	3.48	1.47	**12.86**
Maintained Flood Control Channel	5.46	9.38	**6.93**
Total	**8.94**	**10.85**	**19.79**

Note:
[1] These other land cover types are not defined in Sawyer et al. (2009) but are included in this table for acreage calculation purposes.

4.1.1. Vegetation Types

No vegetation alliance of adequate size for mapping was identified in the Project area.

4.1.2. Other Land Cover Types

Two other land cover types are present and discussed below. These land cover types do not match any cover types described in *A Manual of California Vegetation.*

Disturbed/Developed. Disturbed/Developed areas within the Project area include paved and dirt roads and other unvegetated areas. Vegetation, when present includes ruderal species such as treasure flower (*Gazania*

linearis), redstem filaree (*Erodium cicutarium*), and London rocket (*Sisymbrium irio*), and scattered ornamental species such as oleander (*Nerium oleander*).

Flood Control Channel. The flood control channel was used to map portions of the Project area that are maintained by the District after large storm events and as needed to remove trash and debris. This includes the existing channel and Little Mountain Basin. These areas are largely unvegetated with some scattered non-native species such as water speedwell (*Veronica anagallis-aquatica*), white sweetclover (*Melilotus albus*), and Russian thistle (*Salsola tragus*). Several native species are also present such as watercress (*Nasturtium officinale*), common knotweed (*Persicaria lapathifolia*), and seep monkey flower (*Erythranthe guttata*).

4.2. Soils

The majority of soils in the Project area and vicinity are characterized as Tujunga gravelly loamy sand, 0 to 9 percent slopes (TvC). Other soil types include Soboba stony loamy sand, 2 to 9 percent slopes (SpC), Hanford sandy loam, 0 to 2 percent slopes (HbA), Hanford coarse sandy loam, 2 to 9 percent slopes (HaC), and Friant-Rock outcrop complex (Fr) (USDA NRCS, 2026a; 2026b). Soil types occurring in the Project area are provided on Figure 3 (Attachment 1).

Tujunga gravelly loamy sand (TvC) is comprised of very deep, somewhat excessively drained soils that formed in alluvium from granitic sources. Tujunga soils are on alluvial fans and floodplains, including urban areas. It is somewhat excessively drained with negligible to low runoff and high saturated hydraulic conductivity. Flooding is none to frequent. This soil is used for grazing, citrus, grapes, other fruits, and urban residential or commercial development. Uncultivated areas have a cover of shrubs, annual grasses and forbs. In urban areas ornamentals and turf-grass are common.

Soboba stony loamy sand (SpC) is comprised of deep, excessively drained soils that formed in alluvium from predominantly granitic rock sources. Sobaba soils are on alluvial fans and flood plains. It is excessively drained with very slow runoff and very rapid permeability. The soils are used mostly for pasture. The native vegetation is annual grasses and forbs and chaparral shrubs.

The Hanford series (Hanford sandy loam (HbA) and Hanford coarse sandy loam (HaC)) is comprised of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Hanford soils are on stream bottoms, floodplains and alluvial fans. They are well drained with negligible to low runoff and moderately rapid permeability. Hanford soils are used for growing a wide range of fruits, vegetables, and general farm crops. They are also used for urban development and dairies. Vegetation in uncultivated areas is mainly annual grasses and associated herbaceous plants.

Friant-Rock outcrop complex (Fr) is comprised of shallow, well drained soils that formed in material weathered from mica schist, quartz schist and gneiss. Friant soils are on mountainous uplands. Well drained; medium to very rapid runoff; moderately rapid permeability. It is well drained with medium to very rapid runoff and moderately rapid permeability. These soils are used principally for grazing, wildlife, and watershed. Native vegetation is buckwheat, chaparral, and naturalized grasses and forbs.

4.3. Sensitive Natural Communities

Sensitive natural communities are defined by CDFW (2026b) as, "...communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." The literature review identified seven sensitive natural communities within the region, including Riversidian alluvial fan sage scrub, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern mixed riparian forest, southern riparian forest, southern riparian scrub, and southern sycamore alder riparian woodland (CDFW, 2026a). However, none of these sensitive natural communities were observed within the Project area. Additionally, no other sensitive natural communities were detected during the field surveys.

4.4. Special-Status Species

Plants or wildlife may be ranked as special-status species due to declining populations, vulnerability to habitat change, or restricted distributions. These include listed species that have been formally designated as federally endangered or threatened by USFWS, pursuant to the FESA or as state endangered, threatened, or rare (for plants only) by CDFW pursuant to the CESA or the CNPPA. CDFW FP species are considered rare or facing possible extinction and receive additional protection under Sections 3511, 4700, 5050, or 5515 of the California FGC while SSC are those species, subspecies, or distinct populations of an animal native to California that are considered for protection by CDFW for a variety of reasons, such as population declines or range restrictions. “Special Animals” is a broad term used to refer to all the animal taxa tracked by the CNDDB, regardless of their legal or protection status. The Special Animals list includes taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g., Audubon Society, The Wildlife Society, etc.), and the scientific community.

Table 2 summarizes the geographic range, habitat, and conservation status for all special-status species with potential to occur in the Project area. Special-status species that were considered but were determined to be unlikely to occur in the Project area are provided in Attachment 5 and are not addressed further in this report.

Table 2. Special-Status Species with a Potential to be Present

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
INVERTEBRATES				
Bombus crotchii Crotch's bumble bee	Colonial insect; open grassland & scrub; underground colonies, often in old rodent burrows. Food plants include many native species such as *Antirrhinum*, *Clarkia*, *Dendromecon*, *Eschscholzia*, *Chaenactis*, *Lupinus*, *Phacelia*, *Salvia*, and *Eriogonum*. Coastal California east to the Sierra-Cascade crest and south into Mexico.	Spring – Summer	FED: None CA: CAN END, S2, SA	**MODERATE:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain. Two CNDDB occurrences within two to five miles of the Project area at Lytle Creek and California State University. Several CNDDB occurrences within 10 miles surrounding the Project area. Two iNaturalist observations within two miles northwest at Cal State University, and one within three miles east near Daley Flood Control Basin (San Bernardino Mountains).
Danaus plexippus Monarch butterfly	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Closed-cone coniferous forest.	Year-round	FED: PROP THR CA: S2, SA	**MODERATE:** No suitable nectar plants are present. Multiple recent iNaturalist records within 0.5 miles south of the Project area.
AMPHIBIANS				
Spea hammondii Western spadefoot	Cismontane woodland, coastal scrub, valley & foothill grassland, vernal pool, wetland. Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Requires loose soils for burrowing and nearby seasonal wetlands. Vernal pools are essential for breeding and egg-laying. Endemic to CA and northern Baja CA. In CA, found in foothills of the Sierra Nevada Mountains up to 4,500 ft, the Central Valley, and Coast Range from Santa Clara and Santa Cruz Cos. to San Diego Co.	Year-round	FED: PROP THR CA: S3S4, SSC, SA	**LOW:** Marginally suitable habitat in the Project area, but lacking vegetation and wetlands. CNDDB occurrences within 2 to 5 miles at Devils Canyon Percolation Basins and along the base of the San Bernardino Mountains (Badger Canyon, Sycamore Canyon, East Twin Creek, Daley Flood Control Basin, Little Sand Creek). Several iNaturalist observations within 1 mile around Little Mountain; many within 10 miles.
REPTILES				
Anniella stebbinsi Southern California legless lizard	Broadleaved upland forest, chaparral, coastal dunes, coastal scrub. Variety of habitats; generally in moist, loose soil. Occurs in sandy or loose loamy soils under sparse vegetation. They prefer soils with a high moisture content. Active year-around. Generally south of the Transverse Range,	Year-round	FED: None CA: S3, SSC, SA	**LOW:** No suitable habitat, lacking high soil moisture and vegetation. Many CNDDB occurrences and iNaturalist observations within 10 miles, several within two to five miles of Project area along Lytle Creek, Cable Creek, Cal State University, Shandin Hills, Waterman Canyon, East Twin Creek, Little San Creek.

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
	extending to northwestern Baja California. Disjunct populations in the Tehachapi and Piute Mountains in Kern County.			
Aspidoscelis tigris stejnegeri Coastal whiptail	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils. Coastal California, Transverse, and Peninsular ranges, south to Baja California.	Year-round	FED: None CA: S3, SSC, SA	**MODERATE:** Suitable habitat in coarse soils with sparse vegetation. Several CNDDB occurrences within four miles west along Lytle Creek, several others within 10 miles at Lost Lake (Cajon Canyon), Colton, Reche Canyon, City Creek, Highland. Three iNaturalist observations within 10 miles at Meyer Canyon, Reche Canyon, and Colton.
Arizona elegans occidentalis California glossy snake	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California.	Year-round	FED: None CA: S2, SSC, SA	**LOW:** Marginally suitable habitat, lacking vegetation. CNDDB occurrences within three to five miles along Lytle Creek, Running Springs (San Bernardino Mntns), San Bernardino; others within five to 10 miles in Bloomington, Redlands, Highland. iNaturalist observations within 10 miles in Running Springs, Santa Ana River area in Redlands and Highland; one within four miles south in San Bernardino.
Thamnophis hammondii Two-striped gartersnake	Marsh & swamp, riparian scrub, riparian woodland, wetland. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth. Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation.	Year-round	FED: None CA: S3S4, SSC, SA	**LOW:** No suitable aquatic habitat or permanent fresh water. Several CNDDB occurrences in San Bernardino Mountains within 10 miles north at Silverwood Lake, Grass Valley Creek; one within five miles north in Devil Canyon and one two miles east in East Twin Creek. Many iNaturalist observations within 10 miles in San Bernardino Mountains (south of Lake Arrowhead and Running Springs, west and north of Silverwood Lake).
Crotalus ruber Red-diamond rattlesnake	Chaparral, Mojavean desert scrub, Sonoran desert scrub below 3,000 ft elevation. Chaparral, woodland, grassland, and desert areas from coastal San Diego and Orange Counties to the eastern slopes of the Peninsular Ranges, north through western Riverside and southern San Bernardino Counties. Occurs in rocky areas and dense	Mid-Spring–Mid-Fall	FED: None CA: S3, SSC, SA	**LOW:** Suitable habitat in rocky substrates, but lacking dense vegetation. Two CNDDB occurrences within 10 miles in Highland along Plunge Creek. iNaturalist observations within two to four miles near Lytle Creek, Highway 18 (Wildwood Park), East Twin Creek, and San Bernardino.

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
	vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.			
BIRDS				
Astur cooperii Cooper's hawk	Mature forest, open woodlands, wood edges. Nests in coniferous, deciduous, and mixed woods; dense stands of live oak, riparian deciduous or other forest habitats. Increasingly found in suburbs and cities where some tall trees exist for nest sites. Common throughout the lower 48 states.	Year-round	FED: None CA: S4, WL, SA	**HIGH:** Suitable foraging habitat in the adjacent Little Mountain, no suitable nesting habitat. No CNDDB records available. Many iNaturalist and eBird observations within 10 miles. Several iNaturalist within 0.5 mile at Little Mountain, and within 1 mile at Cal State University.
Falco columbarius Merlin	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms and ranches. Clumps of trees or windbreaks are required for roosting in open country. Breeds in northern North America and Eurasia. Winters to southern US, Mexico, Central and South America, North Africa, and Europe. Uncommon wintering species in southern California desert and valleys.	Winter	FED: None CA: S3S4, WL, SA	**HIGH:** Suitable foraging habitat in the adjacent Little Mountain. One CNDDB occurrence (2013) within 2 miles north at Devils Canyon; 1 within 7 miles south in Colton (along Santa Ana River). One iNaturalist observation within 6 miles along Lytle Creek (Glen Helen Regional Park); more within 10 miles in San Bernardino, Loma Linda, Highland, San Bernardino Mountains (near Running Springs). Many eBird observations within 10 miles; 1 within 0.25 mile of the Project area at Little Mountain, several within 1 to 2 miles at Cal State University, Devil Canyon, Little Mountain.
Athene cunicularia (*hypugaea*) Western burrowing owl	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Nests mainly in rodent burrows; forages in open habitat. Year-around, increasingly uncommon in southern California; through western US & Mexico.	Year-round	FED: None CA: CAN END, S2, SSC, SA	**MODERATE:** Suitable habitat in the Project area with some suitable burrows. No CNDDB records. No iNaturalist or eBird observations within 10 miles. Under burrowing owl (*Athene cunicularia*) records, CNDDB occurrences within 6 miles southwest near Rialto Airport, within 7 miles south at San Bernardino Airport and near Colton Golf Club. eBird observations at the same locations, as well as within 2 miles west, on the west side of Little Mountain, and within 7 miles south in Colton (along Santa Ana River). iNaturalist observations also at Rialto Airport and San Bernardino Airport.
Lanius ludovicianus Loggerhead shrike	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense	Year-round	FED: None CA: S4, SSC, SA	**MODERATE:** Marginally suitable habitat. No CNDDB occurrences within 10 miles. iNaturalist observations within 2 miles north at Cal State University (Badger Hill), also within 4 miles southwest on Lytle Creek (San Bernardino), within 10 miles in Redlands. eBird in similar

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
	shrubs and brush for nesting. Widespread North America; valley floor to 7000 ft elevation.			locations, also 8 miles west on Lytle Creek; within 10 miles west in Fontana, Rialto Airport, north at Cajon Pass, south in Colton, San Bernardino, Loma Linda, Redlands, and east in Highland.
Agelaius tricolor Tricolored blackbird	Freshwater marsh, swamp, wetland. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony. Dense emergent wetlands with cattails, tules, or agricultural fields. Highly colonial species. Largely endemic to California. Most numerous in Central Valley and vicinity. Southern and central California coastal and inland localities; northeast California (Modoc, Lassen, Siskiyou Counties).	Year-round	FED: None CA: THR, S2, SSC, SA	**NOT LIKELY TO OCCUR:** No suitable habitat, lacking open water, dense emergent wetland vegetation. Closest CNDDB occurrence 10 miles south near Loma Linda. iNaturalist and eBird observations within 10 miles north at north end of Silverwood Lake, 10 miles south at San Timoteo Canyon, within 4 miles south in San Bernardino (Meadowbrook Park). Additional eBird observations within 3 miles north near Cal State University, within 7 miles west at Glen Helen Regional Park, within 10 miles south in Bloomington, Colton, and Loma Linda.
MAMMALS				
Lasiurus xanthinus Western yellow bat	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats below 2,000 ft elevation. Roosts in trees, particularly palms. Forages over water and among trees. Southern California and Arizona, Mexico, and Central America. Migrates from California in winter.	Warm season	FED: None CA: S3, SSC, SA	**LOW:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek. One CNDDB occurrence within 2 miles west (1992) and one within 4 miles south (1992); others within 10 miles in Fontana, Grand Terrace, Redlands, and Highland; one iNaturalist occurrence 6 miles west, west of Lytle Creek.
Antrozous pallidus Pallid bat	Deserts, grasslands, shrublands, woodlands and forests, below 6,000 ft elevation. Specifically chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, and valley & foothill grassland. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. Forages on insects which are captured on the ground. California, southwestern North America	Warm season	FED: None CA: S3, SSC, SA	**NOT LIKELY TO OCCUR:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek. One CNDDB occurrence (1929) 10 miles southeast in Redlands. Closest iNaturalist observations in Orange County.

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
	thru interior Oregon & Washington. Does not migrate, hibernates in winter.			
Eumops perotis californicus Western mastiff bat	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, valley & foothill grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels. Central and southern California, southern Arizona, New Mexico, southwestern Texas, northern Mexico.	Year-round	FED: None CA: S3S4, SSC, SA	**NOT LIKELY TO OCCUR:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek. Five CNDDB occurrences within 6 to 10 miles south and east in Colton and San Bernardino (near Santa Ana River, City Creek), and Harrison Mountain; one from 1933. Closest iNaturalist observation in Los Angeles.
Nyctinomops femorosaccus Pocketed free-tailed bat	Variety of arid areas in Southern California; pine-juniper woodlands, Joshua tree woodland, palm oasis, desert wash, desert riparian scrub, Sonoran desert scrub. Rocky areas with high cliffs. Forages over water and open shrubland. Southwestern US, Baja California, and Sonora Mexico.	Year-round	FED: None CA: S3, SSC, SA	**NOT LIKELY TO OCCUR:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek, no suitable roosting cliffs. One CNDDB occurrence (1985) overlaps the Project vicinity. Closest iNaturalist observation in Palm Springs.
Lepus californicus bennettii San Diego black-tailed jackrabbit	Diverse, open habitat types, especially shrublands. Intermediate canopy stages of shrub habitats and open shrub, herbaceous and tree habitats, and herbaceous edges. Southwestern California and northwestern Baja California.	Year-round	FED: None CA: S3S4, SA	**LOW:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek. One CNDDB occurrence (2005) within 4 miles southwest at the 210 FWY and Lytle Creek, one within 7 miles south in Colton (1995), one within 10 miles west in Fontana (2001). iNaturalist observations within 6 to 10 miles southeast near San Bernardino Airport, Highland, Redlands; 5 to 8 miles west at Lytle Creek, Nealys Corner.
Neotoma lepida intermedia San Diego desert woodrat	Coastal scrub, sagebrush scrub, chaparral; moderate to dense canopies preferred. Particularly abundant in rock outcrops, rocky cliffs, and slopes. Southern California from San Diego County to San Luis Obispo County, disjunct in San Joaquin Valley and southern Sierra Nevada.	Year-round	FED: None CA: S3S4, SSC, SA	**MODERATE:** No suitable habitat in the Project area; however, suitable habitat is present in nearby Lytle Creek and may be present in the adjacent Little Mountain. One CNDDB occurrence (1993) within 2 miles north at Sycamore Canyon. Several CNDDB occurrences within four miles west along Lytle Creek (presumed extant); one within 10 miles in Highland (City Creek). Not documented in iNaturalist.
Taxidea taxus American badger	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils for digging burrows. Needs	Year-round	FED: None CA: S3, SSC, SA	**LOW:** No suitable habitat in the Project area; however, suitable habitat may be present in the adjacent Little Mountain and nearby Lytle Creek. One CNDDB

Species Name	Habitat and Distribution	Flowering or Activity Season	Conservation Status	Occurrence Potential
	sufficient prey items (burrowing rodents) and open, uncultivated ground. Mountains, deserts, interior valleys through central and western North America.			occurrence (undated, presumed extant) within 4 miles south in San Bernardino; a few farther within 10 miles surrounding the Project area in Lake Arrowhead and Reche Canyon. Three iNaturalist observations within 10 miles in Fontana, Reche Canyon, and Running Springs.

Notes:

General references (botany): Baldwin et al., 2012; CDFW, 2026a; 2026b; 2026d; CNPS, 2026; CCH, 2026; Jepson eFlora, 2026.

General references (wildlife): American Ornithologists Union, 1998 (including supplements through 2011); Barbour and Davis, 1969; CDFW, 2026a; 2026c; Feldhammer et al., 2003; Gannon, 2003; Garrett and Dunn, 1981; Grinnell and Miller, 1944; Hall, 1981; Hansen and Shedd, 2025; Hatfield et al., 2015; Jennings and Hayes, 1994; Pierson and Rainey, 1998; Sibley, 2000; Stebbins, 2003; Wilson and Ruff, 1999.

Conservation Status

Federal designations: (FESA, USFWS)
- END: Federally listed, endangered
- THR: Federally listed, threatened
- PROP: Proposed for federal listing
- BGEPA: Bald and Golden Eagle Protection Act
- DE: Delisted

State designations: (CESA, CDFW)
- END: State listed, endangered
- THR: State listed, threatened
- CAN: State Candidate for listing
- SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
- FP: Fully protected. May not be taken or possessed without permit from CDFW.
- FGC: Fish and Game Code. Species regulated under California Fish and Game Code.
- SA: CDFW Special Animal
- SX: Presumed Extirpated
- WL: CDFW Watch List

Title 14: Cal. Code Regs. Tit. 14, § 460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.
- DE: Delisted

CDFW Natural Diversity Data Base Designations: Applied to special-status plants and sensitive plant communities; where correct category is uncertain, CDFW uses two categories or question marks
- S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres
- S1.1: Very threatened
- S1.2: Threatened
- S1.3: No current threats known
- S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above)
- S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above)

CDFW Natural Diversity Data Base Designations: Applied to special-status wildlife; where correct category is uncertain, CDFW uses two categories or question marks
- S1: Critically Imperiled – At high risk of extirpation in state due to restricted range, very few population occurrences, very steep declines, severe threats, or other factors
- S2: Imperiled – At high risk of extirpation in state due to the above causes
- S3: Vulnerable – At moderate risk of extirpation in state due to the above causes
- S4: Apparently Secure – At a fairly low risk of extirpation in the state due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors
- S5: Secure – At very low risk of extirpation in the state

California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) designations. Note: According to CNPS (http://www.cnps.org/cnps/rareplants/ranking.php), plants ranked as CRPR 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.

- 1A: Plants presumed extinct in California
- 1B: Plants rare and endangered in California and throughout their range
- 2: Plants rare, threatened or endangered in California but more common elsewhere in their range
- 3: Plants about which we need more information; a review list
- 4: Plants of limited distribution; a watch list

California Rare Plant Rank Threat designations:

- .1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2 Fairly endangered in California (20-80% occurrences threatened)
- .3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Definitions of occurrence probability: Estimated occurrence probabilities are based on cited literature sources, field surveys, and habitat analyses.

Present: Species (or sign) was observed in the Project area during recent surveys, or a population has been acknowledged by CDFW, USFWS, or local experts.

High: Suitable habitat (including soils) for the species occurs in the Project area and a known occurrence occurs within five miles within the past 20 years; however, the species was not detected during recent surveys.

Moderate: Suitable habitat (including soils) for the species occurs in the Project area and a known regional record has been documented, but not within five miles of the Project area or within the past 20 years; or the species' range includes the geographic area and suitable habitat exists in the Project area; or records are documented within five miles of the Project area within the past 20 years, but habitat is marginal or limited.

Low: Marginal or limited habitat for the species occurs in the Project area and the species' range includes the geographic area, but there are no documented occurrences within five miles of the Project area within the past 20 years.

Not Likely to Occur: Species or sign not observed in the Project area, the Project area is outside the species' known range, habitat conditions in the Project area are not suitable for occurrence, and there are no documented occurrences within five miles of the Project area within the past 20 years.

4.4.1. Special-Status Plants

Evaluations of plant species potential to occur were based on results of Project area surveys, vegetation community mapping, and record searches in the CDFW CNDDB database (CDFW, 2026a), CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2026), and CCH records (CCH, 2026).

No special-status plant species were observed in the Project area during field surveys. No special-status plant species were identified in the Project area with potential to occur.

4.4.2. Special-Status Wildlife

Evaluations of wildlife species potential to occur were based on results of Project area surveys, vegetation community mapping, and record searches in the CDFW CNDDB database (CDFW, 2026a), iNaturalist database (iNaturalist 2026), and eBird database (eBird, 2026).

No special-status wildlife were observed in the Project area during field surveys. Several special-status wildlife species were identified in the Project area with potential to occur and are discussed below.

4.4.2.1. Listed Threatened, Endangered or Candidate Wildlife

This section includes species listed as threatened or endangered, or candidate proposed for listing, under FESA or CESA which were observed or have at least a moderate potential to be present in the Project area. No threatened or endangered wildlife species were detected during surveys. One federally proposed species, monarch butterfly (*Danaus plexippus*), and two candidates for state listing, Crotch's bumblebee (*Bombus crotchii*) and Western burrowing owl (*Athene cunicularia*), have the potential to occur in the Project area. These species are described below. No other listed wildlife species or candidate proposed for listing are expected to occur in the Project area.

Crotch's bumble bee (*Bombus crotchii*). Crotch's bumble bee is a candidate for state listing (CESA endangered) and is a CDFW Special Animal (CDFW, 2026a; 2026c). It occurs primarily in California, with a concentration in the Central Valley, but is also found along the Pacific Coast, adjacent ranges, and in the deserts. It can be found in a variety of vegetation communities including grassland, scrub, chaparral, and woodlands. Crotch's bumble bee prefers smaller flowers that are abundant with pollen and nectar, such as milkweed (*Asclepias* spp.), chaenactis (*Chaenactis* spp.), deerweed (*Acmispon glaber*), buckwheat (*Eriogonum* spp.) lupines (*Lupinus* spp.), clovers (*Medicago* spp.), phacelias (*Phacelia* spp.), and sages (*Salvia* spp.) (Xerces et al., 2018; Williams et al., 2014). It frequently nests underground in abandoned rodent burrows but can also be found above ground, utilizing tufts of grass, old bird nests, rock piles, and cavities in dead trees. It has been documented at a wide range of elevations ranging from 120 feet below mean sea level to 8,500 feet amsl (CDFW, 2026a). No suitable habitat is present in the Project area (including preferred flowering plants); however, suitable habitat may be present in the adjacent Little Mountain and CNDDB and iNaturalist records are documented within five miles of the Project area. There is moderate potential for it to occur in the Project area.

Monarch butterfly (*Danaus plexippus*). The monarch butterfly is proposed for federal listing (FESA threatened) and is CDFW Special Animal (CDFW, 2025a; 2025d). Monarch butterflies are brightly colored with orange wings contrasted by black veins and white spots. Their larvae are similarly distinctive, with bold black, white, and yellow bands along the body. The vivid coloration of monarch caterpillars and adults serves as a warning of their potential toxicity to predators, which they acquire as larvae by feeding on milkweed (primarily *Asclepias* spp.), their obligate host plant (USFWS, 2024). In the western U.S., the widely distributed narrow-leaved milkweed (*A. fascicularis*) and showy milkweed (*A. speciosa*) are commonly used. The availability of forage for pollinators often depends on rainfall and seasonal patterns, as drought or dry periods can reduce plant growth, floral abundance, and nectar resources (Phillips et al., 2018). The monarch butterfly is notable for its long-distance multi-generational annual migrations. In the fall, most of the western U.S.

population migrates to California to winter within a coastal strip from Los Angeles to Monterey (CDFW, 2026a). Overwintering monarchs require roosting habitat in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nearby nectar and water sources. In February and March, monarchs breed at the roost site before dispersing to suitable habitat to lay their eggs. Spring and summer breeding areas for monarch butterflies are found throughout most of California (except for the northwest), where milkweed and nectar plants are available. In southern California, breeding is generally in more coastal locations, but records exist in all non-desert areas. No suitable nectar or hosts plants are present in the Project area, however, suitable habitat may be present in the adjacent Little Mountain and multiple recent iNaturalist records are documented within 0.5 miles of the Project area. There is moderate potential for it to occur in the Project area.

Western burrowing owl (*Athene cunicularia*). Burrowing owl is a CDFW Species of Special Concern and Special Animal (CDFW, 2026a; 2026c). The western burrowing owl subspecies (*Athene cunicularia hypugaea*) is a candidate for state listing (CESA endangered) and includes all burrowing owls in California. It is a small, terrestrial owl of open country. During breeding season, it ranges throughout most of the western U.S. It occurs year-around in southern California, but may be more numerous during fall and winter, when migratory individuals from farther north join the regional resident population. Burrowing owl favor flat, open annual or perennial grassland or gentle slopes and sparse shrub or tree cover. They use the burrows of ground squirrels and other rodents for shelter and nesting. Availability of suitable burrows is an important habitat component. Where ground squirrel burrows are not available, the owls may use alternate burrow sites or man-made features (such as drainpipes, debris piles, or concrete slabs). In the California deserts, burrowing owl generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel, 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC, 1993), is February 1 through August 31. While eBird records are documented within two miles and CNDDB and iNaturalist records are documented within 6 to 7 miles, there is suitable habitat present in the Project area. Suitable foraging habitat and multiple potential burrow sites were identified within the survey buffer during the burrowing owl habitat assessment (see Section 4.5. and Attachment 1, Figure 4). No burrowing owls or their sign (e.g., active burrows, pellets, whitewash) were observed during surveys There is moderate potential for it to occur in the Project area.

4.4.2.2. Other Special-Status Wildlife

In addition to the federal and state statutes and policies described above, the CDFW maintains a list of wildlife species of conservation concern. The CDFW compiles these in its compendium of “Special Animals” (2026c). These species are referred to as “special-status species” throughout this report. Those that have at least a moderate potential to be present are addressed below.

Reptiles

Coastal whiptail (*Aspidoscelis tigris stejnegeri*). The coastal whiptail is a CDFW Species of Special Concern and Special Animal (CDFW, 2026a; 2026c). It is found in coastal southern California, mostly west of the Peninsular Ranges and south of the Transverse Ranges. Its range extends north into Ventura County and south to Baja California. It occurs in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, mixed conifer, pine-juniper, chamise-redshank chaparral, mixed chaparral, desert scrub, desert wash, alkali scrub, and annual grasslands. It is most associated with areas of dense vegetation but are also found around sandy areas along gravelly arroyos or washes (Stebbins, 2003). The reproductive season generally occurs between May and August; however, this may vary depending on local conditions. Suitable habitat is present in the Project area and several CNDDB records are documented within four miles along Lytle Creek. Other CNDDB and iNaturalist records are documented within 10 miles. There is moderate potential for it to occur in the Project area.

Birds

Loggerhead shrike (*Lanius ludovicianus*). The loggerhead shrike is a CDFW Species of Special Concern and Special Animal (CDFW, 2026a; 2026c). The breeding range includes Alberta, Saskatchewan, and Manitoba in Canada; the majority of the United States except the Pacific Northwest; and Mexico (Yosef, 1996). It is a common resident and winter visitor in lowlands and foothills throughout California. It forages in a variety of open habitats including agricultural fields and desert shrublands where perch sites are used to scan for potential prey. Loggerhead shrike feeds on insects and small vertebrates such as lizards and snakes. It typically nests in dense vegetation but also may nest in isolated shrubs and trees near agricultural fields (Ehrlich et al., 1988). Suitable habitat is present in the Project area. iNaturalist and eBird records are documented within two miles at California State University, San Bernardino with others within 6 to 10 miles. There is moderate potential for it to occur in the Project area.

Raptors. Two special-status raptors, designated as Special Animals and Watch List species by CDFW (CDFW, 2025a; 2025c), have potential to occur in the Project area: Cooper's hawk (*Astur cooperii*) and merlin (*Falco columbarius*). These species are not expected to nest in the Project area as it lacks suitable nesting trees for Cooper's hawk and is outside the breeding range for the merlin. However, these raptors may occasionally forage on the Project area or fly overhead. Several iNaturalist and eBird observations of both Cooper's hawk and merlin are documented within one mile at California State University, San Bernardino and Devil's Canyon. One CNDDB record for merlin is documented in the immediate Project vicinity and one eBird record overlaps the Project area. Many other records of these species (CNDDB, iNaturalist, eBird) are documented within 5 to 10 miles of the Project area. There is high potential for them to occur in the Project area.

Mammals

San Diego desert woodrat (*Neotoma lepida intermedia*). San Diego desert woodrat is a CDFW Species of Special Concern and Special Animal (CDFW, 2026a; 2026c). It ranges in coastal California from San Luis Obispo south through the Transverse and Peninsular Ranges into Baja California. It occurs in Joshua tree woodlands, pinyon-juniper woodlands, mixed chaparral, sagebrush, and desert habitats (Zeiner et al., 1990), and preferentially builds nests in areas with large boulders as they presumably provide better protection from predators (Thompson, 1982; Smith, 1995). It constructs middens of sticks and leaves in crevices in rock outcrops, rocky cliffs, rock piles, and occasionally in debris piles (Thompson, 1982). No suitable habitat in the Project area; however, suitable habitat and may be present in the adjacent Little Mountain. There are several CNDDB and iNaturalist records are documented within 5 miles. There is moderate potential for it to occur in the Project area.

4.5. Burrowing Owl Habitat Assessment Results

A burrowing owl habitat assessment survey was conducted in accordance with the CDFW Burrowing Owl Survey Guidelines. No live burrowing owl individuals or their sign (e.g., active burrows, pellets, whitewash) were observed during field surveys. However, fourteen potential burrows were identified within the Burrowing Owl Survey Buffer, each burrow measured at least four inches in diameter and approximately 60 inches in depth. These burrows may provide suitable breeding and overwintering sites for residents or migratory owls. The findings of the habitat assessment are summarized in Table 3 and provided in Figure 4 (Attachment 1).

Table 3. Potential Burrowing Owl Burrows

Burrow Number	Burrow Characteristics
1	Burrow approximately 8 inches wide. No burrowing owl sign was observed at the burrow entrance or the surrounding area.

Burrow Number	Burrow Characteristics
2	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
3	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
4	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
5	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
6	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
7	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
8	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
9	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
10	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
11	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
12	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
13	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.
14	Partially ground squirrel No burrowing owl sign was observed at the burrow entrance or the surrounding area.

Note:
The burrowing owl habitat assessment was conducted on May 7, 2026.

4.6. Designated Critical Habitat

The literature review determined that there is no critical habitat overlapping the Project area (USFWS, 2026a; 2026b). Critical habitat for San Bernardino kangaroo rat is located approximately one mile north of the Project area, north of California State University, San Bernardino, and 2.5 miles west, along Lytle Creek (USFWS, 2026b). Critical habitat for Southwestern willow flycatcher is located approximately three miles northeast in the San Bernardino Mountains, along Waterman Canyon. Critical habitat for thread-leaved brodiaea is located approximately three miles northeast in the San Bernardino Mountains, near Arrowhead Springs (USFWS, 2026b).

4.7. Wildlife Habitat and Movement

4.7.1. Wildlife Habitat

The term habitat refers to the environment and ecological conditions where a species is found. Wildlife habitat is often described in terms of vegetation, though a more thorough explanation includes details such as availability or proximity to water, suitable nesting or denning sites, shade, foraging perches, cover sites to escape from predators, soils that are suitable for burrowing or hiding, proximity of noise and disturbance,

and other factors that are unique to each species. For many wildlife species, vegetation reflects important components of habitat, including regional climate, physical structure, biological productivity, and food resources. Thus, the vegetation descriptions in Section 4.1. are useful overarching descriptors for wildlife habitat.

4.7.2. Native Birds: Migratory Bird Treaty Act / California Fish and Game Code

The Project area supports limited native vegetation and shrubs that may provide nesting habitat. Numerous common birds are known to nest in the area and many of these are likely to nest in the Project area. Due to the high probability that birds could nest on site during construction, regular monitoring and nest site management may be necessary throughout the breeding season. Many adult birds would flee from equipment during Project construction; however, nestlings and eggs would be vulnerable. If Project activities include site grading or brush removal during nesting season, then it would likely destroy bird nests, including eggs or nestling birds. For most birds, these impacts can be avoided by scheduling initial clearing and grading outside the nesting season. Or, if initial clearing and grading are undertaken during nesting season, work may be limited to areas where no nesting birds are present, as documented by pre-construction nest surveys. The species most likely to nest in the Project area during construction are mourning dove (*Zenaida macroura*), California towhee (*Melozone crissalis*), and black phoebe (*Sayornis nigricans*). Other common birds such as red-tailed hawk (*Buteo jamaicensis*) and red-shouldered hawk (*Buteo lineatus*) were suspected of nesting in areas adjacent to the Project area and may also nest in the Project vicinity. These birds are protected by the MBTA and FGC.

4.7.3. Wildlife Movement

The ability for wildlife to move freely among populations and habitat areas is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to individual animals' ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The California Essential Habitat Connectivity Project was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Caltrans and CDFW, 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (natural landscape blocks) and areas essential for ecological connectivity between them (essential connectivity areas). This map does not reflect the needs of particular species but is based on overall biological connectivity and ecological integrity.

The Essential Connectivity Map (Caltrans and CDFW, 2010) identifies that the Project area is not located within an Essential Connectivity Area. However, within a mile north, an Essential Connectivity Area is mapped that spans the San Gabriel and San Bernardino Mountains, connecting to the San Jacinto Mountains to the south and the Lucerne Valley and Mojave Desert to the north. The Project is not expected to impact local or migratory wildlife movement between natural landscape blocks within the San Jacinto Mountains or the broader southern California region.

5. CONCLUSIONS

No vegetation communities were identified in the Project area; other land cover types include Disturbed/Developed areas and the Maintained Flood Control Basin portions of the channel. No sensitive natural communities occur in the Project area.

No special-status plant or wildlife species were observed in the Project area during biological surveys. No special-status plant species have potential to occur. Special-status wildlife have potential to occur, as identified in Table 2 and described in Section 4.4. No state or federally listed wildlife were detected. However, three wildlife candidates proposed for listing, Crotch bumble bee, monarch butterfly, and western burrowing owl, have a moderate potential to be present. Several non-listed special-status wildlife species have moderate to high potential to occur including:

REPTILES
- coastal whiptail

BIRDS
- loggerhead shrike
- Cooper's hawk
- merlin

MAMMALS
- San Diego desert woodrat

The burrowing owl habitat assessment identified 14 potential burrowing owl burrows with no live burrowing owl individuals or their sign detected during field surveys. No designated critical habitat is present within the Project area. The Project area does not overlap with California Essential Habitat Connectivity Areas or natural landscape blocks. The Project is not expected to impact local or migratory wildlife movement between natural landscape blocks within the San Jacinto Mountains or the broader southern California region.

6. LITERATURE CITED

American Ornithologists' Union (AOU). 1998. Check-list of the North American Birds, 7th ed. Prepared by Committee on Classification and Nomenclature. American Ornithologists' Union, Washington DC.

Baldwin, B.G., D.H., Goldman, D.J. Keil, R. Patterson, and T.J. Rosatti (eds.). 2012. The Jepson Manual: Higher Plants of California. 2nd edition. University of California Press, Berkeley, California.

Barbour, R.W. and W.H. Davis. 1969. Bats of America. University Press of Kentucky, Lexington, Kentucky.

CalTrans (California Department of Transportation) and CDFW (California Department of Fish and Wildlife). 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. https://www.wildlife.ca.gov/Conservation/Planning/Connectivity. Last accessed: May 2026.

CBOC (California Burrowing Owl Consortium). 1993. Burrowing owl survey protocol and mitigation guidelines. Alviso, California. 13 pp.

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

CDFW (California Department of Fish and Wildlife). 2026a. California Natural Diversity Database. Bios: Version 6. California Department of Fish and Wildlife, Sacramento, CA. Last accessed: June 2026.

_____. 2026b. California Sensitive Natural Communities. Vegetation Classification and Mapping Program, CDFW, Sacramento. https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities Last accessed: June 2026.

_____. 2026c. Special Animals List. State of California, Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database (CNDDB). April.

_____. 2026d. Special Vascular Plants, Bryophytes, and Lichens List. State of California, Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database (CNDDB). April.

_____. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. Online: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959. Last accessed: May 2026.

CCH (Consortium of California Herbaria). 2026. [Online]: http://ucjeps.berkeley.edu/consortium/. Last accessed: June 2026.

CNPS (California Native Plant Society), Rare Plant Program. 2026. Inventory of Rare and Endangered Plants. California Native Plant Society. Sacramento. [Online]: https://www.rareplants.cnps.org. Last accessed: June 2026.

City of San Bernardino, Planning Division. 2005. San Bernardino General Plan. November. Available at: https://www.sanbernardino.gov/372/Planning-Division. Last accessed: June 2026.

eBird (eBird.org). 2026. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Online: http://www.ebird.org. Last accessed: June 2026.

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon and Schuster, New York. 785pp.

Gannon, W.L. 2003. Bats (Vespertilionidae, Molossidae, Phyllostomidae). Pages 56-74 in Feldhamer, G.A., B.C. Thompson, and J.A. Chapman, eds. Wild Mammals of North America: Biology, Management and Conservation, 2nd ed. Johns Hopkins University Press, Baltimore MD. 1216 pp.

Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, Los Angeles, California.

Grinnell, J. and A.H. Miller. 1944. The Distribution of the Birds of California. Cooper Ornithological Club, Berkeley (reprint 1986 by Artemisia Press, Lee Vining, CA).

Hall, E.R. 1981. The Mammals of North America. John Wiley and Sons, New York.

Hansen, R. and Shedd, J. 2025. California Amphibians and Reptiles. Princeton University Press, Princeton, New Jersey.

Hatfield, R., Jepsen, S., Thorp, R., Richardson, L. & Colla, S. 2015. *Bombus crotchii*. The IUCN Red List of Threatened Species 2015: e. T44937582A46440211. Online: http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T44937582A46440211.en.

iNaturalist. 2026. [Online]: https://www.inaturalist.org/observations. Last accessed: June 2026.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA. 225 pp.

Jepson eFlora. 2026. Jepson Flora Project. [Online]: https://ucjeps.berkeley.edu/eflora/. Last accessed: May 2026.

Phillips, B.B., Shaw, R.F., Holland, M.J., Fry, E.L., Bardgett, R.D., Bullock, J.M., and Osborne, J.L. 2018. Drought reduces floral resources for pollinators. Global Change Biology 24(7): 3226–3235. https://doi.org/10.1111/gcb.14130

Pierson, E.D. and W.E. Rainey. 1998. California leaf-nosed bat, *Macrotus californicus* Pallid bat, *Antrozous pallidus*, Townsend's big-eared bat, *Corynorhinus townsendii*. Western mastiff bat, *Eumops perotis*, pocketed free-tailed bat *Nyctinomops femorosaccus*, and big free-tailed bat *Nyctinomops macrotis*. Pages 27-41 and 66-76 in Bolster, B.C. (ed.) Terrestrial Mammal Species of Special Concern in California. Draft Final Report prepared by P.V. Brylski, P.W. Collins, E.D. Pierson, W.E. Rainey and T.E. Kucera. Report submitted to California Department of Fish and Game Wildlife Management Division, Nongame Bird and Mammal Conservation Program for Contract No. FG3146WM. Online: http://www.dfg.ca.gov/wildlife/nongame/ssc/1998mssc.html.

San Bernardino County. 2022. Countywide Plan, County Policy Plan. September. Available at: https://countywideplan.sbcounty.gov/policy-plan/. Last accessed: June 2026.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A manual of California vegetation, 2nd ed., CA Native Plant Society and California Department of Fish and Game, Sacramento, CA. 1300 pp.

Sibley, D.A. 2000. Sibley Guide to Birds. A. A. Knopf, New York, NY.

Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians, 3rd ed. Houghton Mifflin Company, Boston Mass.

Smith, F.A. 1995. Den characteristics and survivorship of woodrats (Neotoma lepida) in the eastern Mohave Desert. Southwestern Naturalist 40(4): 366–372.

Thompson, S.D. 1982. Spatial utilization and foraging behavior of the desert woodrat, Neotoma lepida lepida. Journal of Mammalogy 63(4): 570–581.

U.S. Climate Data. 2026. U.S. Climate Data Website https://www.usclimatedata.com/climate/san-bernardino/california/united-states/usca0978. Last accessed: May 2026.

USDA (U.S. Department of Agriculture) NRCS (Natural Resource Conservation Service). 2026a. Web Soil Survey. Available at: https://websoilsurvey.nrcs.usda.gov/app/. Accessed: April 2026.

_____. 2026b. Official Soil Series Descriptions (OSDs). Available at: https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osds. Accessed: April 2026.

USFWS (U.S. Fish and Wildlife Service). 2026a. IPaC Information for Planning and Consultation. Available at: https://ipac.ecosphere.fws.gov/. Last accessed: June 2026.

_____. 2026b. Critical Habitat Mapper. Available at: https://www.arcgis.com/apps/Embed/index.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77&extent=-124.1522,38.0501,-121.4496,39.2098&zoom=true&scale=true&details=true&disable_scroll=true&theme=light. Last accessed: May 2026.

_____. 2024. Monarch Butterfly (*Danaus plexippus*) Species Status Assessment Report, Version 2.3.

_____. 2007. Protection of eagles; definition of ‘‘disturb.’’ Federal Register 72:31132 -31140 (5 Jun).

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

Wilkerson, R.L. and R.B. Siegel. 2011. Distribution and abundance of western burrowing owls (*Athene cunicularia hypugaea*) in southeastern California. Southwestern Naturalist 56:378-384.

Wilson, D.E. and S. Ruff, eds. 1999. Smithsonian Book of North American Mammals. Smithsonian Institution Press, Washington DC.

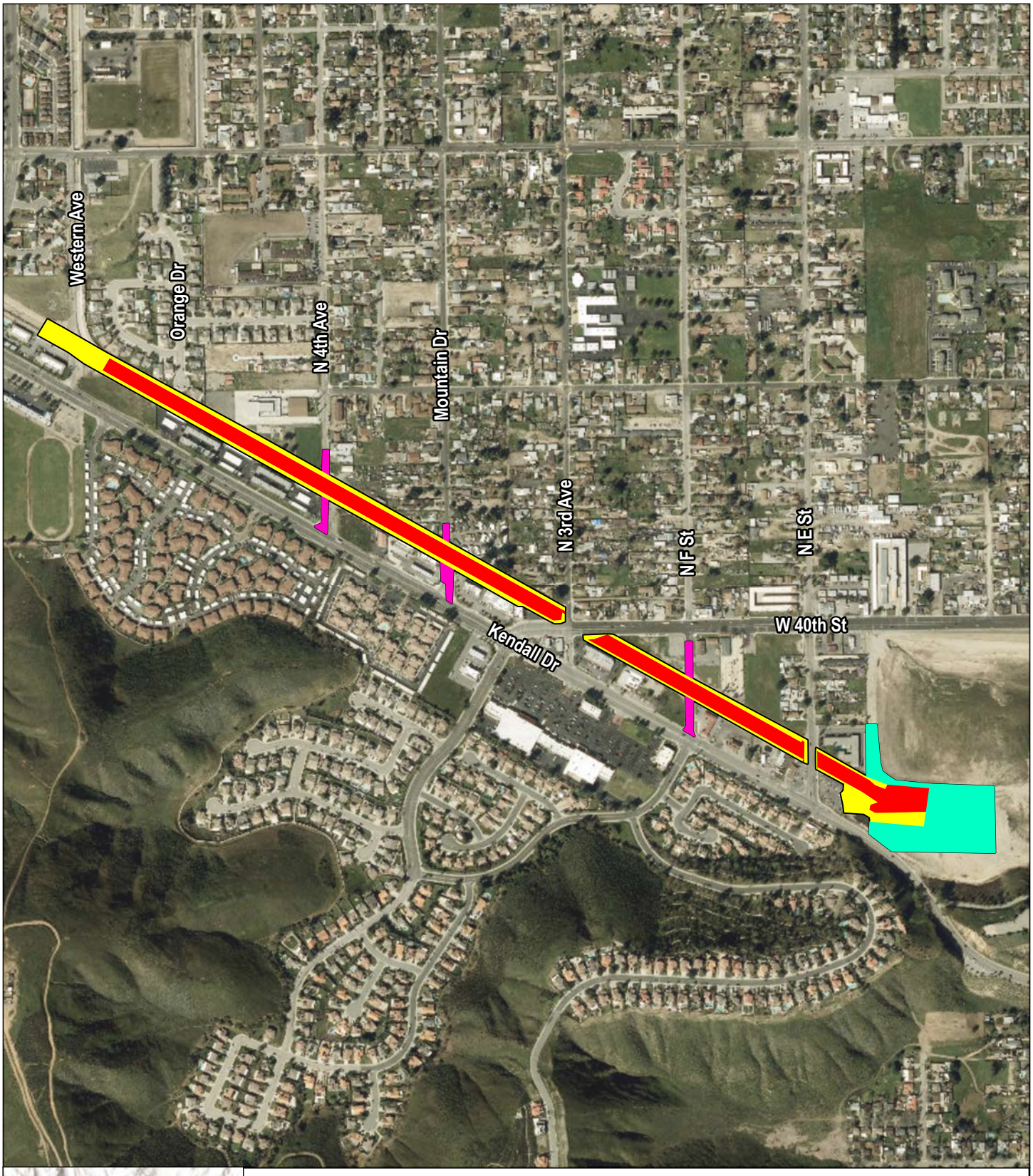
Xerces (The Xerces Society for Invertebrate Conservation), Defenders of Wildlife, and Center for Food Safety. 2018. A Petition To The State Of California Fish And Game Commission To List The Crotch bumble bee (*Bombus crotchii*), Franklin’s bumble bee (*Bombus franklini*), Suckley cuckoo bumble bee (*Bombus suckleyi*), and western bumble bee (*Bombus occidentalis occidentalis*) as Endangered under the California Endangered Species Act.

Yosef, R. 1996. Loggerhead shrike (Lanius ludovicianus). In: Poole, A.; Gill, F., eds. The birds of North America, No. 231. Philadelphia, PA: The Academy of Natural Sciences and Washington, DC: The American Ornithologists' Union.

Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White (eds.). 1990. California's Wildlife (1988-1990). Vol. I-III. California Depart. of Fish and Game, Sacramento, California.

Attachment 1

FIGURES



San Bernardino County

Project Location

Project Area
Permanent Disturbance Area
Pavement Rehabilitation (Temporary Disturbance)
Staging Area (Temporary Disturbance)
Temporary Construction Area

0 500 1,000 feet

Figure 1

Project Overview

Sources: County of San Bernardino, 2026; Esri, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



Figure 2

Vegetation and Land Cover

Project Area

Cover Type

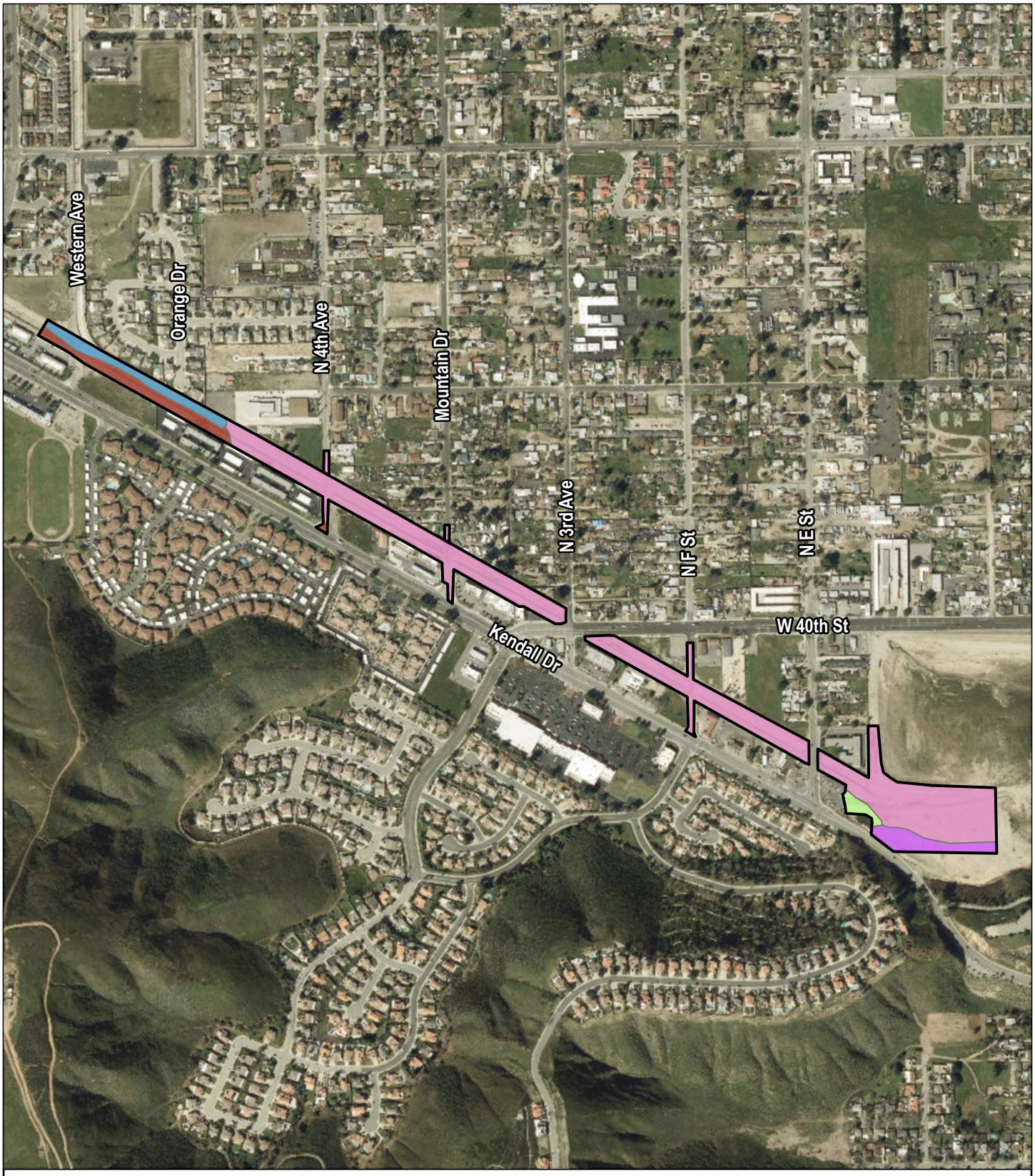
CDFW Maintaned Flood Control Channel

Disturbed / Developed

0 500 1,000 feet

Sources: County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



Soils

- Friant-Rock outcrop complex
- Hanford coarse sandy loam, 2 to 9 percent slopes
- Hanford sandy loam, 0 to 2 percent slopes
- Soboba stony loamy sand, 2 to 9 percent slopes
- Tujunga gravelly loamy sand, 0 to 9 percent slopes

Project Area

0 500 1,000 feet

Figure 3

Soils

Sources: USDA NRCS, 2026; County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



Figure 4

Biological Resources

Potential Burrowing Owl Burrow

Burrowing Owl Survey Buffer (150 meters)

Project Area

0 500 1,000 feet

Sources: USDA NRCS, 2026; County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.

Attachment 2

CNDDB AND IPAC RESULTS

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (San Bernardino North (3411723) OR San Bernardino South (3411713) OR Cajon (3411734) OR Silverwood Lake (3411733) OR Lake Arrowhead (3411732) OR Devore (3411724) OR Harrison Mtn. (3411722) OR Fontana (3411714) OR Redlands (3411712))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Actinemys pallida southwestern pond turtle	ARAAD02032	Proposed Threatened	None	G2	SNR	SSC
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G3	S2	SSC
Aimophila ruficeps canescens southern California rufous-crowned sparrow	ABPBX91091	None	None	G5T3	S4	WL
Allium howellii var. clokeyi Mt. Pinos onion	PMLIL02161	None	None	G3G4T2	S2	1B.3
Ambrosia monogyra singlewhorl burrobrush	PDAST50010	None	None	G5	S2	2B.2
Anaxyrus californicus arroyo toad	AAABB01230	Endangered	None	G1G2	S2	SSC
Anniella stebbinsi Southern California legless lizard	ARACC01060	None	None	G3	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
Artemisiospiza belli belli Bell's sparrow	ABPBX97021	None	None	G5T2T3	S3	WL
Asclepias nyctaginifolia Mojave milkweed	PDASC02190	None	None	G4?	S2	2B.1
Asio otus long-eared owl	ABNSB13010	None	None	G5	S3?	SSC
Aspidoscelis hyperythra orange-throated whiptail	ARACJ02060	None	None	G5	S2S3	WL
Aspidoscelis tigris stejnegeri coastal whiptail	ARACJ02143	None	None	G5T5	S3	SSC
Astragalus hornii var. hornii Horn's milk-vetch	PDFAB0F421	None	None	GUT1	S1	1B.1
Astur cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Athene cunicularia burrowing owl	ABNSB10010	None	Candidate Endangered	G4	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Batrachoseps gabrieli San Gabriel slender salamander	AAAAD02110	None	None	G2G3	S2S3	
Berberis nevinii Nevin's barberry	PDBER060A0	Endangered	Endangered	G1	S1	1B.1
Bombus crotchii Crotch's bumble bee	IIHYM24480	None	Candidate Endangered	G2	S2	
Bombus morrisoni Morrison bumble bee	IIHYM24460	None	None	G3	S1S2	
Bombus pensylvanicus American bumble bee	IIHYM24260	None	None	G3G4	S2	
Brodiaea filifolia thread-leaved brodiaea	PMLIL0C050	Threatened	Endangered	G2	S2	1B.1
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S4	
Calochortus palmeri var. palmeri Palmer's mariposa-lily	PMLIL0D122	None	None	G3T2	S2	1B.2
Calochortus plummerae Plummer's mariposa-lily	PMLIL0D150	None	None	G4	S4	4.2
Canbya candida white pygmy-poppy	PDPAP05020	None	None	G3G4	S3S4	4.2
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Castilleja lasiorhyncha San Bernardino Mountains owl's-clover	PDSCR0D410	None	None	G2?	S2?	1B.2
Centromadia pungens ssp. laevis smooth tarplant	PDAST4R0R4	None	None	G3G4T2	S2	1B.1
Chaetodipus fallax fallax northwestern San Diego pocket mouse	AMAFD05031	None	None	G5T3T4	S3S4	
Chaetodipus fallax pallidus pallid San Diego pocket mouse	AMAFD05032	None	None	G5T3T4	S3S4	
Charina bottae umbratica southern rubber boa	ARADA01011	None	Threatened	G4T2	S2	
Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
Chorizanthe parryi var. parryi Parry's spineflower	PDPGN040J2	None	None	G3T2	S2	1B.1
Chorizanthe xanti var. leucotheca white-bracted spineflower	PDPGN040Z1	None	None	G4T3	S3	1B.2
Cicindela tranquebarica viridissima greenest tiger beetle	IICOL02201	None	None	G5T1	S1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coleonyx variegatus abbotti San Diego banded gecko	ARACD01031	None	None	G5T5	S1S2	SSC
Crotalus ruber red-diamond rattlesnake	ARADE02090	None	None	G4	S3	SSC
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4?	SH	2B.2
Deinandra mohavensis Mojave tarplant	PDAST4R0K0	None	Endangered	G3	S3	1B.3
Diadophis punctatus modestus San Bernardino ringneck snake	ARADB10015	None	None	G5T2T3	S2?	
Dipodomys merriami parvus San Bernardino kangaroo rat	AMAFD03143	Endangered	Endangered	G5T1	S1	SSC
Dipodomys stephensi Stephens' kangaroo rat	AMAFD03100	Threatened	Threatened	G2	S3	
Dodecahema leptoceras slender-horned spineflower	PDPGN0V010	Endangered	Endangered	G1	S1	1B.1
Dudleya abramsii ssp. affinis San Bernardino Mountains dudleya	PDCRA04013	None	None	G4T2	S2	1B.2
Empidonax traillii extimus southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	G5T2	S3	
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eremothera boothii ssp. boothii Booth's evening-primrose	PDONA03052	None	None	G5T4	S3	2B.3
Eriastrum densifolium ssp. sanctorum Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	G4T1	S1	1B.1
Erigeron parishii Parish's daisy	PDAST3M310	Threatened	None	G2	S2	1B.1
Euchloe hyantis andrewsi Andrew's marble butterfly	IILEPA5032	None	None	G3G4T2	S2	
Eugnosta busckana Busck's gallmoth	IILEM2X090	None	None	G1G3	S2S3	
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G4G5T4	S3S4	SSC
Euphydryas editha quino quino checkerspot butterfly	IILEPK405L	Endangered	Candidate Endangered	G4G5T1T2	S1S2	
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Fimbristylis thermalis hot springs fimbristylis	PMCYP0B0N0	None	None	G4	S1S2	2B.2
Galium californicum ssp. primum Alvin Meadow bedstraw	PDRUB0N0E6	None	None	G5T2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Gila orcuttii arroyo chub	AFCJB13120	None	None	G1	S2	SSC
Glaucomys oregonensis californicus San Bernardino flying squirrel	AMAFB09021	None	None	G5T1T2	S1S2	SSC
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Helianthus nuttallii ssp. parishii Los Angeles sunflower	PDAST4N102	None	None	G5TX	SX	1A
Helminthoglypta taylori westfork shoulderband	IMGASC2640	None	None	G1	S1	
Heuchera parishii Parish's alumroot	PDSAX0E1F0	None	None	G3	S3	1B.3
Horkelia cuneata var. puberula mesa horkelia	PDROS0W045	None	None	G4T1	S1	1B.1
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S4	SSC
Imperata brevifolia California satintail	PMPOA3D020	None	None	G3	S3	2B.1
Ivesia argyrocoma var. argyrocoma silver-haired ivesia	PDROS0X021	None	None	G2T2	S2	1B.2
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lasiurus xanthinus western yellow bat	AMACC05070	None	None	G4G5	S3	SSC
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S2	FP
Lepidium virginicum var. robinsonii Robinson's pepper-grass	PDBRA1M114	None	None	G5T3	S3	4.3
Lepus californicus bennettii San Diego black-tailed jackrabbit	AMAEB03051	None	None	G5T3T4	S3S4	
Lilium parryi lemon lily	PMLIL1A0J0	None	None	G3	S3	1B.2
Lycium parishii Parish's desert-thorn	PDSOL0G0D0	None	None	G4	S1	2B.3
Malacothamnus parishii Parish's bushmallow	PDMAL0Q0C0	None	None	GXQ	SX	1A
Monardella macrantha ssp. hallii Hall's monardella	PDLAM180E1	None	None	G5T3	S3	1B.3
Monardella pringlei Pringle's monardella	PDLAM180J0	None	None	GX	SX	1A
Nasturtium gambelii Gambel's water cress	PDBRA270V0	Endangered	Threatened	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Neolarra alba white cuckoo bee	IIHYM81010	None	None	GH	SH	
Neotamias speciosus speciosus lodgepole chipmunk	AMAFB02172	None	None	G4T3T4	S2	
Neotoma lepida intermedia San Diego desert woodrat	AMAFF08041	None	None	G5T3T4	S3S4	
Nyctinomops femorosaccus pocketed free-tailed bat	AMACD04010	None	None	G5	S3	SSC
Oncorhynchus mykiss irideus pop. 10 steelhead - southern California DPS	AFCHA0209J	Endangered	Endangered	G5T1Q	S1	
Onychomys torridus ramona southern grasshopper mouse	AMAFF06022	None	None	G5T3	S3	SSC
Opuntia basilaris var. brachyclada short-joint beavertail	PDCAC0D053	None	None	G5T3	S3	1B.2
Palaeoxenus dohrni Dohrn's elegant eucnemid beetle	IICOL5K010	None	None	G3?	S1S2	
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Pantosteus santaanae Santa Ana sucker	AFCJC02190	Threatened	None	G1	S1	SSC
Pediomelum castoreum Beaver Dam breadroot	PDFAB5L050	None	None	G3	S2	1B.2
Pelazoneuron puberulum var. sonorense Sonoran maiden fern	PPTHE05192	None	None	G5T4	S2	2B.2
Perideridia parishii ssp. parishii Parish's yampah	PDAPI1N0C2	None	None	G4T3T4	S2	2B.2
Perognathus alticolus alticolus white-eared pocket mouse	AMAFD01081	None	None	G2TH	SH	SSC
Perognathus longimembris brevinasus Los Angeles pocket mouse	AMAFD01041	None	None	G5T2	S1S2	SSC
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G4	S4	SSC
Polioptila californica californica coastal California gnatcatcher	ABPBJ08081	Threatened	None	G4G5T3Q	S2	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Rana muscosa southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	G1	S2	WL
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	IIDIP05021	Endangered	None	G1T1	S1	
Rhinichthys gabrielino Santa Ana speckled dace	AFCJB3705K	Proposed Threatened	None	G1	S1	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ribes divaricatum var. parishii Parish's gooseberry	PDGRO020F3	None	None	G5TX	SX	1A
Riversidian Alluvial Fan Sage Scrub Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	G1	S1.1	
Schoenus nigricans black bog-rush	PMCYP0P010	None	None	G4	S2	2B.2
Scutellaria bolanderi ssp. austromontana southern mountains skullcap	PDLAM1U0A1	None	None	G4T3	S3	1B.2
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	1B.2
Setophaga petechia yellow warbler	ABPBX03010	None	None	G5	S3	SSC
Sidalcea malviflora ssp. dolosa Bear Valley checkerbloom	PDMAL110FH	None	None	G4G5T2	S2	1B.2
Sidalcea neomexicana salt spring checkerbloom	PDMAL110J0	None	None	G4	S2	2B.2
Siphateles bicolor mohavensis Mohave tui chub	AFCJB1303H	Endangered	Endangered	G4T1	S1	FP
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	G3	S3.2	
Southern Mixed Riparian Forest Southern Mixed Riparian Forest	CTT61340CA	None	None	G2	S2.1	
Southern Riparian Forest Southern Riparian Forest	CTT61300CA	None	None	G4	S4	
Southern Riparian Scrub Southern Riparian Scrub	CTT63300CA	None	None	G3	S3.2	
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Spea hammondii western spadefoot	AAABF02020	Proposed Threatened	None	G2G3	S3S4	SSC
Sphenopholis obtusata prairie wedge grass	PMPOA5T030	None	None	G5	S2	2B.2
Streptanthus bernardinus Laguna Mountains jewelflower	PDBRA2G060	None	None	G3G4	S3S4	4.3
Streptanthus campestris southern jewelflower	PDBRA2G0B0	None	None	G3	S3	1B.3
Symphyotrichum defoliatum San Bernardino aster	PDASTE80C0	None	None	G2	S2	1B.2
Symphyotrichum greatae Greata's aster	PDASTE80U0	None	None	G2	S2	1B.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis hammondii two-striped gartersnake	ARADB36160	None	None	G4	S3S4	SSC
Thamnophis sirtalis pop. 1 south coast gartersnake	ARADB3613F	None	None	G5T1T2	S1S2	SSC
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S3	

Record Count: 127

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

San Bernardino County, California



Local office

Carlsbad Fish And Wildlife Office

(760) 431-9440
(760) 431-5901

2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385

NOT FOR CONSULTATION

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:

Mammals

NAME	STATUS
San Bernardino Merriam's Kangaroo Rat Dipodomys merriami parvus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2060	Endangered

Birds

NAME	STATUS
Coastal California Gnatcatcher Polioptila californica 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/8178	Threatened
Least Bell's Vireo Vireo bellii pusillus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5945	Endangered

NOT FOR CONSULTATION

Reptiles

NAME	STATUS
Southwestern Pond Turtle Actinemys pallida Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4768	Proposed Threatened

Amphibians

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

Fishes

NAME	STATUS
Santa Ana Speckled Dace Rhinichthys gabrielino No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4124	Proposed Threatened
Santa Ana Sucker Catostomus santaanae There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3785	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Flowering Plants

NAME	STATUS
Nevin's Barberry Berberis nevinii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8025	Endangered
Slender-horned Spineflower Dodecahema leptoceras Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4007	Endangered
Thread-leaved Brodiaea Brodiaea filifolia Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6087	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.

NOT FOR CONSULTATION

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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 avoidance and minimization 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 Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

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. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle Aquila chrysaetos 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	Breeds Jan 1 to Aug 31

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 (■)

NOT FOR CONSULTATION

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.

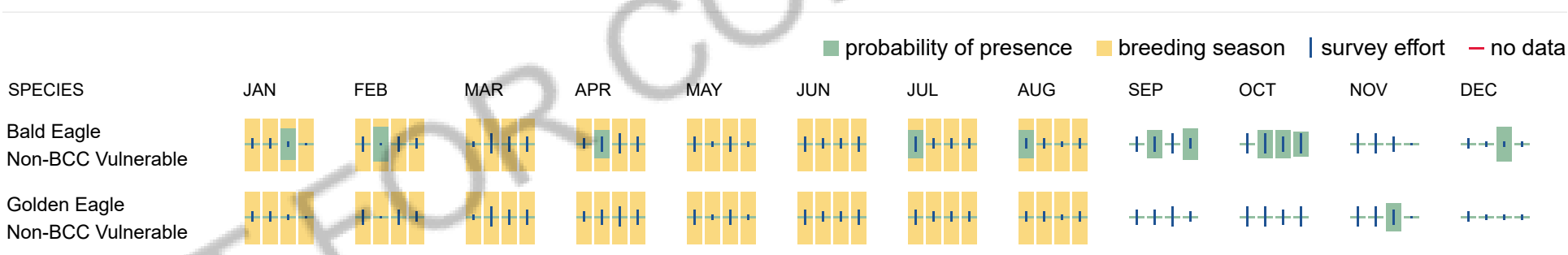
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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.



Bald & Golden Eagles FAQs

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 an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report
On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). 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 line or no data line (red horizontal) 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 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 and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are 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 resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), 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.

Interpreting the Probability of Presence Graphs

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 taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

NOT FOR CONSULTATION

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.

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.

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.

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.

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.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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 avoidance and minimization measures for birds
- 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

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

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.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15

NOT FOR CONSULTATION

Bald Eagle Haliaeetus leucocephalus — 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/1626

Belding's Savannah Sparrow Passerculus sandwichensis beldingi — Breeds Apr 1 to Aug 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/8

Black-chinned Sparrow Spizella atrogularis — Breeds Apr 15 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/9447

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Gull Larus californicus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cassin's Finch Haemorhous cassinii — Breeds May 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/9462

Clark's Grebe Aechmophorus clarkii — Breeds Jun 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
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

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

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

NOT FOR CONSULTATION

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 Grebe Aechmophorus occidentalis — Breeds Jun 1 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/6743

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

White-headed Woodpecker Dryobates albolarvatus gravirostris — Breeds May 1 to Aug 15
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.

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.

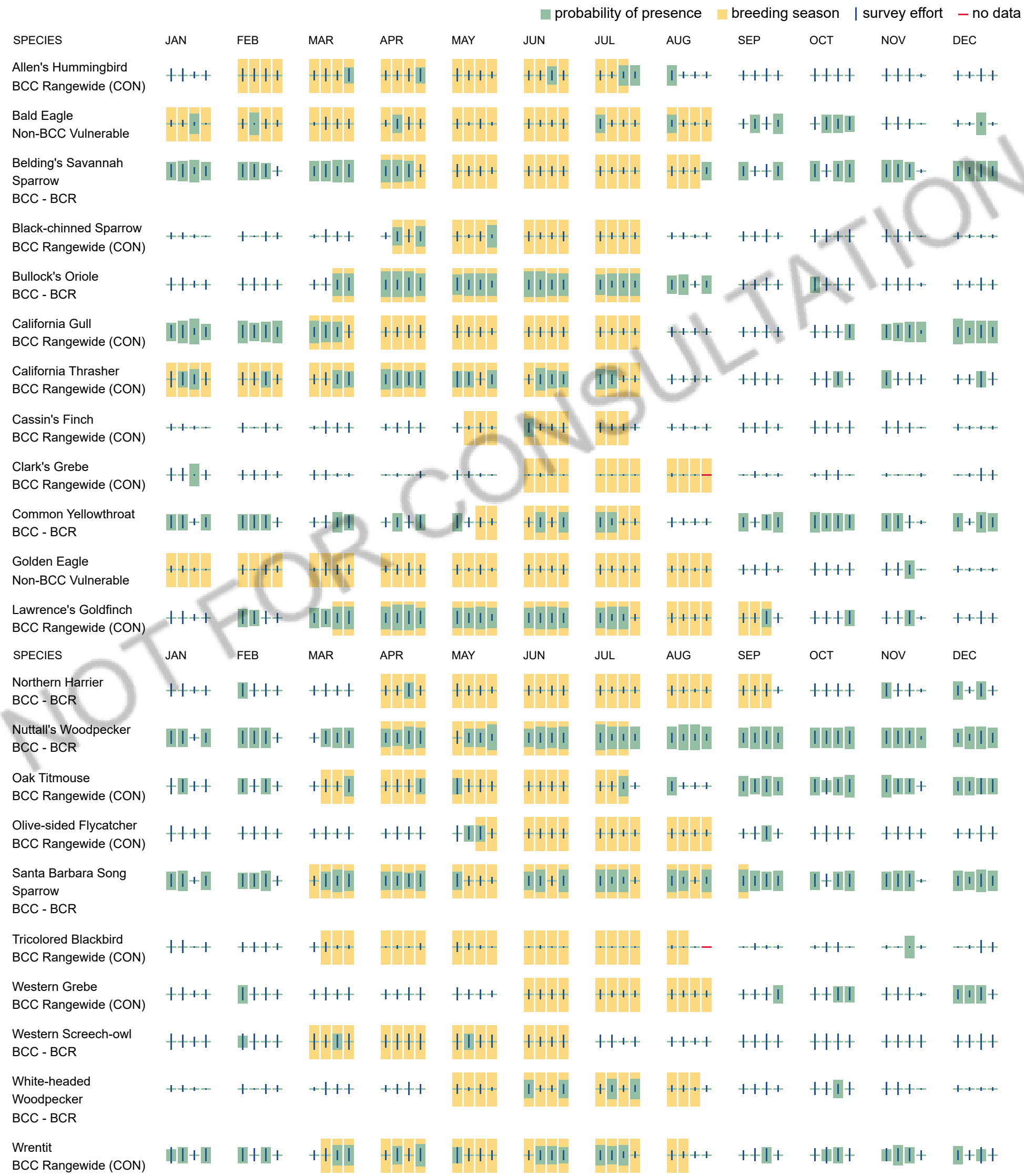
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Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 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.



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Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed 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 Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

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) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection 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, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

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 to 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 resident), you may query your location using the RAIL Tool and view 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 IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), 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 Bald and Golden Eagle Protection 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 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 BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

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.

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 look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). 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 does not represent all birds present in your project area. 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

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present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
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 taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
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.

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.

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.

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.

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.

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.

This location did not intersect any wetlands mapped by NWI.

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

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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.

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Attachment 3

OBSERVED SPECIES LIST

Observed Species List	
Latin Name	**Common Name**
VASCULAR PLANTS	
Dicotyledons	
ADOXACEAE	MUSKROOT FAMILY
Sambucus nigra ssp. cerulea (S. mexicana)	Mexican elderberry, blue elderberry
APOCYNACEAE	DOGBANE FAMILY
* *Nerium oleander*	Oleander
ASTERACEAE	ASTER FAMILY
Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
Ambrosia psilostachya	Western ragweed
Baccharis salicifolia	Mule fat
Erigeron canadensis	Canada horseweed
* *Gazania linearis*	Treasure flower
* *Hedypnois cretica*	Crete weed, Crete hedypnois
Helianthus annuus	Western sunflower
* *Lactuca serriola*	Prickly lettuce
Lepidospartum squamatum	Scale-broom
Pseudognaphalium californicum	California everlasting
Xanthium strumarium	Cocklebur
BRASSICACEAE	MUSTARD FAMILY
* *Brassica fruticulosa*	Mediterranean cabbage
* *Brassica nigra*	Black mustard
* *Capsella bursa-pastoris*	Shepherd's purse
Nasturtium officinale	Water cress
* *Sisymbrium irio*	London rocket
CHENOPODIACEAE	GOOSEFOOT FAMILY
* *Chenopodium album*	Lamb’s quarters
* *Salsola tragus*	Russian thistle
EUPHORBIACEAE	SPURGE FAMILY
Croton californicus	California croton
FABACEAE	LEGUME FAMILY
Acmispon americanus	Spanish clover
Acmispon glaber	Deerweed
* *Melilotus albus*	White sweet clover
* *Melilotus officinalis*	Yellow sweet clover
* *Vicia villosa*	Winter vetch
GERANIACEAE	GERANIUM FAMILY
* *Erodium cicutarium*	Redstem filaree
LAMIACEA	SAGE FAMILY
* *Marrubium vulgare*	Horehound
Salvia apiana	White sage
MALVACEAE	MALLOW FAMILY
* *Malva parviflora*	Cheeseweed
MYRSINACEAE	MYRSINE FAMILY
* *Anagallis arvensis*	Scarlet pimpernel
ONAGRACEAE	PRIMROSE FAMILY
Camissoniopsis bistorta	California sun cup

Observed Species List	
Latin Name	**Common Name**
* *Oenothera laciniata*	Cut-leaf evening primrose
OXALIDACEAE	OXALIS FAMILY
* *Oxalis corniculata*	Yellow sorrel
PHRYMACEAE	LOPSEED FAMILY
Erythranthe guttata	Seep monkeyflower
PLANTAGINACEAE	PLANTAIN FAMILY
* *Veronica anagallis-aquatica*	Water speedwell
POLYGONACEAE	BUCKWHEAT FAMILY
Eriogonum fasciculatum	California buckwheat
Persicaria lapathifolia	Common knotweed
* *Rumex crispus*	Curly dock
SIMAROUBACEAE	QUASSIA or SIMAROUBA FAMILY
* *Ailanthus altissima*	Tree of heaven
SOLANACEAE	NIGHTSHADE FAMILY
Datura wrightii	Jimsonweed, tolguacha
* *Nicotiana glauca*	Tree tobacco
* *Solanum nigrum*	Black nightshade
URTICACEAE	NETTLE FAMILY
* *Urtica urens*	Dwarf nettle
Monocotyledons	
ARECACEAE	PALM FAMILY
* *Washingtonia robusta*	Mexican fan palm
CYPERACEAE	SEDGE FAMILY
* *Cyperus involucratus*	Umbrella sedge
POACEAE	GRASS FAMILY
* *Avena barbata*	Slender wild oat
* *Avena fatua*	Wild oat
* *Bromus diandrus*	Ripgut brome
* *Bromus madritensis*	Foxtail chess
* *Bromus rubens*	Red brome
* *Bromus tectorum*	Cheat grass
* *Echinochloa colona*	Jungle-rice
* *Polypogon monspeliensis*	Rabbitfoot grass
* *Schismus barbatus*	Mediterranean schismus
INVERTEBRATE ANIMALS	
ARTHROPODA	
INSECTA	INSECTS
COLEOPTERA	BEETLES
* *Harmonia* sp.	Lady beetle
Trogloderus sp.	Darkling beetle
HYMENOPTERA	ANTS, BEES, AND WASPS
Apis mellifera	Western honey bee
Pogonomyrmex sp.	Harvester ant
Xylocopa californica	California carpenter bee
LEPIDOPTERA	BUTTERFLIES AND MOTHS
Pieris rapae	Cabbage Butterfly

Observed Species List	
Latin Name	**Common Name**
ARACHNIDA	ARACHNIDS
ARANEAE	SPIDERS
Latrodectus mactans	Southern black widow
MOLLUSKA	**MOLLUSKS**
GASTROPODA	GASTROPODS
LITTORINIMORPHA	
* *Potamopyrgus antipodarum*	Red-tailed hawk snail
VERTEBRATE ANIMALS	
REPTILIA	**REPTILES**
IGUANIDAE	IGUANID LIZARDS
Uta stansburiana	Side-blotched lizard
AVES	BIRDS
ACCIPITRIDAE	HAWKS, EAGLES, HARRIERS
Buteo lineatus	Red-shouldered hawk
Buteo jamaicensis	Red-tailed hawk
FALCONIDAE	FALCONS
Falco sparverius	American kestrel
CHARADRIIDAE	PLOVERS
Charadrius vociferus	Killdeer
COLUMBIDAE	PIGEONS AND DOVES
Charadrius vociferus	Killdeer
* *Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	Mourning dove
APODIDAE	SWIFTS
Aeronautes saxatalis	White-throated swift
TROCHILIDAE	HUMMINGBIRDS
Calypte costae	Costa's hummingbird
TYRANNIDAE	TYRANT FLYCATCHERS
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird
HIRUNDINIDAE	SWALLOWS
Hirundo rustica	Barn swallow
CORVIDAE	CROWS AND JAYS
Corvus corax	Common raven
TROGLODYTIDAE	WRENS
Thryomanes bewickii	Bewick's wren
MUSCICAPIDAE	THRUSHES AND ALLIES
Sialia mexicana	Western bluebird
MIMIDAE	MOCKINGBIRDS AND THRASHERS
Mimus polyglottos	Northern mockingbird
STURNIDAE	STARLINGS
* *Sturnus vulgaris*	European starling
EMBERIZIDAE	SPARROWS, WARBLERS, TANAGERS
Pipilo maculatus	Spotted towhee

Observed Species List	
Latin Name	**Common Name**
Icterus cucullatus	Hooded oriole
FRINGILLIDAE	FINCHES
Haemorhous mexicanus	House finch
Spinus psaltria	Lesser goldfinch
PASSERIDAE	WEAVERS
* *Passer domesticus*	House sparrow
MAMMALIA	MAMMALS
SCIURIDAE	SQUIRRELS
Otospermophilus beecheyi	Beechey (California) ground squirrel
CANIDAE	FOXES, WOLVES AND COYOTES
Canis familiaris	Domestic dog
FELIDAE	CATS
Felis catus	Domestic cat

Note:
Species introduced to California are indicated by an asterisk. Special-status species have two asterisk. This list includes only species observed on the site. Other species may have been overlooked or unidentifiable due to season (amphibians are active during rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate, many plants are identifiable only in spring). Plants were identified using keys, descriptions, and illustrations in Baldwin et al (2012). Plant taxonomy and nomenclature generally follow Baldwin et al. (2012). Wildlife taxonomy and nomenclature generally follow Hansen and Shedd (2025) for amphibians and reptiles, AOU (1998) for birds, and Wilson and Ruff (1999) for mammals.

Attachment 4

PHOTO EXHIBIT



Photo 1. Northwestern end of the Project site facing downstream on May 7, 2026.



Photo 2. Northwestern end of the Project site facing upstream towards Western Avenue on May 7, 2026.



Photo 3. Adjacent open space near North 4th Street surveyed for biological resources, facing northwest, on May 7, 2026.



Photo 4. Upstream view of the channel facing Mountain Drive on May 7, 2026.



Photo 5. Downstream view of the channel facing North 3rd St on May 7, 2026.



Photo 6. Downstream view of the channel from West 40th St on May 7, 2026.



Photo 7. Upstream view of the channel facing North F St on May 7, 2026.



Photo 8. Downstream view of the channel facing North E St on May 7, 2026.



Photo 9. Upstream view of the channel facing North E St on May 7, 2026.



Photo 10. Downstream view of the southern channel facing the confluence with the primary channel on May 7, 2026.



Photo 11. Upstream view of the confluence between the primary channel (right) and the southern channel (left) on May 7, 2026.



Photo 12. Downstream view from the confluence between the primary channel and the southern channel facing the limts of the Project site on May 7, 2026.



Photo 13. Potential burrowing owl burrow (Burrow Number 1) with no sign detected on the channel bank on May 7, 2026.



Photo 14. Aspen team conducting biological surveys within the channel, facing downstream, on May 7, 2026.



Photo 15. Aspen team conducting the burrowing owl habitat assessment in Little Mountain Basin on May 7, 2026.



Photo 16. Northwestern inlet to Little Mountain Basin inspected during the burrowing owl habitat assessment on May 7, 2026.

Attachment 5

SPECIAL-STATUS SPECIES NOT ADDRESSED

Special-Status Species Not Addressed[1]		
Latin Name	**Common Name**	**Reason for Exclusion**
PLANTS		
Acanthoscyphus parishii var. *parishii*	Parish's oxytheca	Well below the species elevation range.
Allium howellii var. *clokeyi*	Mt. Pinos onion	Well outside of species geographic range.
Allium parishii	Parish's onion	Well outside of species geographic and elevation range.
Ambrosia monogyra	singlewhorl burrobrush	Well outside of species geographic range.
Androsace elongata ssp. *acuta*	California androsace	Well outside of species geographic range.
Arenaria paludicola	marsh sandwort	No suitable aquatic habitat.
Artemisia palmeri	San Diego sagewort	No suitable riparian, coastal scrub, or chaparral habitat.
Asclepias nyctaginifolia	Mojave milkweed	Well outside of species geographic and elevation range.
Asplenium vespertinum	western spleenwort	No suitable coastal scrub or chaparral habitat.
Astragalus hornii var. *hornii*	Horn's milk-vetch	No suitable meadows or seep habitat.
Azolla microphylla	Mexican mosquito fern	No suitable aquatic habitat and outside of species range.
Berberis nevinii	Nevin's barberry	Large conspicuous shrub not observed.
Brodiaea filifolia	thread-leaved brodiaea	No suitable clay soils or habitat.
Calochortus palmeri var. *palmeri*	Palmer's mariposa-lily	Well outside of species geographic range.
Calochortus plummerae	Plummer's mariposa-lily	No suitable coastal scrub or chaparral habitat.
Canbya candida	white pygmy-poppy	Well outside of species geographic and elevation range.
Carex comosa	bristly sedge	No suitable aquatic habitat.
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	Well outside of species geographic range.
Castilleja plagiotoma	Mojave paintbrush	Well outside of species geographic range.
Centromadia pungens ssp. *laevis*	smooth tarplant	No suitable habitat, including alkaline soil conditions.
Chloropyron maritimum ssp. *maritimum*	salt marsh bird's-beak	No suitable marsh habitat.
Chorizanthe leptotheca	peninsular spineflower	No suitable alluvial fan habitat.
Chorizanthe parryi var. *parryi*	Parry's spineflower	No suitable alluvial fan, coastal scrub, or chaparral habitat.
Chorizanthe xanti var. *leucotheca*	white-bracted spineflower	No suitable alluvial fan or coastal scrub habitat.
Convolvulus simulans	small-floweredmorning-glory	No suitable habitat, including seeps or areas of clay or serpentine soils.
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder	Well outside of species geographic range, species is considered extirpated in San Bernardino County.
Deinandra mohavensis	Mojave tarplant	No suitable riparian habitat.
Deinandra paniculata	paniculate tarplant	Well outside of species geographic range.
Diplacus johnstonii	Johnston's monkeyflower	Well below the species elevation range.

Special-Status Species Not Addressed[1]

Latin Name	Common Name	Reason for Exclusion
Dodecahema leptoceras	slender-horned spineflower	Well outside of species geographic range.
Dudleya abramsii ssp. *affinis*	San Bernardino Mountains dudleya	Well below the species elevation range.
Eremothera boothii ssp. *boothii*	Booth's evening-primrose	No suitable woodland habitat below known elevation range.
Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woollystar	No suitable Riversidean alluvial fan sage scrub habitat.
Erigeron parishii	Parish's daisy	Well outside the species geographic range.
Eriogonum umbellatum var. *minus*	alpine sulfur-flowered buckwheat	Well below the species elevation range.
Eriophyllum lanatum var. *obovatum*	southern Sierra woollys unflower	Well below the species elevation range.
Fimbristylis thermalis	hot springs fimbristylis	No suitable aquatic habitat.
Frasera neglecta	pine green-gentian	Well below the species elevation range.
Fritillaria pinetorum	pine fritillary	Well below the species elevation range.
Galium californicum ssp. *primum*	Alvin Meadow bedstraw	No suitable pine forest or chaparral habitat.
Galium jepsonii	Jepson's bedstraw	Well below the species elevation range.
Galium johnstonii	Johnston's bedstraw	Well below the species elevation range.
Helianthus nuttallii ssp. *parishii*	Los Angeles sunflower	No suitable marsh or swamp habiat.
Heuchera caespitosa	urn-flowered alumroot	Well below the species elevation range.
Heuchera parishii	Parish's alumroot	Well below the species elevation range.
Horkelia cuneata var. puberula	mesa horkelia	No suitable alluvial fan, coastal scrub, or chaparral habitat.
Hulsea vestita ssp. *parryi*	Parry's sunflower	Well below the species elevation range.
Imperata brevifolia	California satintail	No suitable seep or wetland habitat.
Juglans californica	Southern California black walnut	Large conspicuous shrub not observed.
Juncus duranii	Duran's rush	Well below the species elevation range.
Lepidium virginicum var. *robinsonii*	*Robinson's peppergrass*	No suitable coastal scrub or chaparral habitat.
Lilium humboldtii ssp. *ocellatum*	ocellated Humboldt lily	No suitable riparian, woodland, or chaparral habitat.
Ivesia argyrocoma var. *argyrocoma*	silver-haired ivesia	Well outside of species geographic range.
Lilium parryi	lemon lily	No suitable riparian meadow habitat.
Lycium parishii	Parish's desert-thorn	Outside the species geographic range, extirpated from San Bernardino North USGS Quadrangle.
Malacothamnus parishii	Parish's bushmallow	Large conspicuous shrub not observed.
Monardella exilis	Mojave monardella	Well outside of species geographic and elevation range.
Monardella macrantha ssp. *hallii*	Hall's monardella	Well below the species elevation range.
Monardella pringlei	Pringle's monardella	Extirpated from Riverside and San Bernardino Counties.

Special-Status Species Not Addressed[1]

Latin Name	Common Name	Reason for Exclusion
Monardella saxicola	rock monardella	No suitable chaparral or coniferous forest habitat.
Muhlenbergia californica	California muhly	No suitable meadow or seep habitat.
Nasturtium gambelii	Gambel's water cress	No suitable marsh or swamp habitat.
Nemacladus gracilis	Slender nemacladus	Well outside of species geographic range.
Opuntia basilaris var. *brachyclada*	short-joint beavertail	Well outside of species geographic range.
Packera ionophylla	Tehachapi ragwort	Well outside of species geographic and elevation range.
Pediomelum castoreum	Beaver Dam breadroot	Well outside of species geographic and elevation range.
Pelazoneuron puberulum var. *sonorense*	Sonoran maiden fern	No suitable meadow or seep habitat.
Pentachaeta aurea ssp. *aurea*	golden-rayed pentachaeta	Well outside of species geographic range.
Perideridia parishii ssp. *parishii*	Parish's yampah	Well below the species elevation range.
Phacelia exilis	Transverse Range phacelia	Well below the species elevation range.
Phacelia mohavensis	Mojave phacelia	Well below the species elevation range.
Piperia leptopetala	narrow-petaled rein orchid	No suitable montane woodland or coniferous forest habitat.
Quercus durata var. *gabrielensis*	San Gabriel oak	Outside of species geographic range, no suitable chaparral or woodland habitat.
Ribes divaricatum var. *parishii*	Parish's gooseberry	No suitable habitat, outside of species range.
Romneya coulteri	Coulter's matilija poppy	Large conspicuous shrub not observed.
Rupertia rigida	Parish's rupertia	Well below the species elevation range.
Schoenus nigricans	black bog-rush	No suitable aquatic habitat.
Scutellaria bolanderi ssp. *austromontana*	southern mountains skullcap	Well outside of species geographic range.
Selaginella asprella	bluish spike-moss	Well below the species elevation range.
Senecio aphanactis	chaparral ragwort	No suitable coastal scrub, or chaparral habitat.
Senecio astephanus	San Gabriel ragwort	No suitable rocky slope habitat.
Sidalcea malviflora ssp. *dolosa*	Bear Valley checkerbloom	No suitable pine, meadow, or grassy habitats.
Sidalcea neomexicana	salt spring checkerbloom	No suitable aquatic habitat.
Sidotheca caryophylloides	chickweed oxytheca	Well below the species elevation range.
Sphenopholis obtusata	prairie wedge grass	No suitable meadow, seep, or woodland habitat.
Streptanthus bernardinus	Laguna Mountains jewelflower	Well outside of species geographic range.
Streptanthus campestris	southern jewelflower	Well outside of species geographic range.
Symphyotrichum defoliatum	San Bernardino aster	No suitable habitat and outside geographic range.
Symphyotrichum greatae	Greata's aster	No suitable mesic habitat.
Syntrichopappus lemmonii	Lemmon's syntrichopappus	Well outside of species geographic range.
Trichostema micranthum	small-flowered bluecurls	Well below the species elevation range.

Special-Status Species Not Addressed[1]		
Latin Name	**Common Name**	**Reason for Exclusion**
INVERTEBRATES		
Bombus morrisoni	Morrison bumble bee	Well outside of species geographic range.
Bombus pensylvanicus	American bumble bee	Well outside of species geographic range.
Cicindela tranquebarica viridissima	greenest tiger beetle	No suitable riparian habitat.
Euchloe hyantis andrewsi	Andrew's marble butterfly	No host plants present and no suitable habitat.
Eugnosta busckana	Busck's gallmoth	No suitable coastal sage scrub habitat and host plants present.
Euphydryas editha quino	Quino checkerspot butterfly	No suitable habitat, no suitable host or nectar plants; outside species geographic range.
Helminthoglypta taylori	westfork shoulderband	Well outside of species geographic range.
Neolarra alba	white cuckoo bee	No suitable coastal scrub habitat.
Palaeoxenus dohrni	Dohrn's elegant eucnemid beetle	No suitable forest habitat.
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	No suitable sand or dune habitat, no suitable soils.
FISHES		
Gila orcuttii	Arroyo chub	No suitable aquatic stream habitat.
Oncorhynchus mykiss irideus pop. 10	Steelhead - southern California DPS	No suitable aquatic stream habitat.
Pantosteus santaanae	Santa Ana sucker	No suitable aquatic stream habitat.
Rhinichthys gabrielino	Santa Ana speckled dace	No suitable aquatic stream habitat.
Siphateles bicolor mohavensis	Mohave tui chub	No suitable aquatic pond habitat.
AMPHIBIANS AND REPTILES		
Actinemys pallida	southwestern pond turtle	No suitable aquatic habitat.
Anaxyrus californicus	Arroyo toad	No suitable aquatic habitat.
Aspidoscelis hyperythra	Orange-throated whiptail	Outside known geographic range.
Batrachoseps gabrieli	San Gabriel slender salamander	Outside known geographic range.
Charina umbratica	Southern rubber boa	No suitable forest habitat.
Coleonyx variegatus abbotti	San Diego banded gecko	No suitable alluvial fan, coastal scrub, or chaparral habitat.
Diadophis punctatus modestus	San Bernardino ringneck snake	No suitable coastal scrub, chaparral, or forested habitat.
Phrynosoma blainvillii	Coast horned lizard	No suitable alluvial habitat, coastal scrub, or chaparral habitat.
Rana draytonii	California red-legged frog	No suitable aquatic habitat; outside of known geographic range.
Rana muscosa	Southern mountain yellow-legged frog	No suitable aquatic habitat.
Thamnophis sirtalis pop. 1	south coast gartersnake	No suitable aquatic habitat.
BIRDS		
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	No suitable alluvial fan, coastal scrub, or chaparral habitat.

Special-Status Species Not Addressed[1]		
Latin Name	**Common Name**	**Reason for Exclusion**
Artemisiospiza belli belli	Bell's sparrow	No suitable alluvial fan, coastal scrub, or chaparral habitat.
Asio otus	long-eared owl	No suitable forest or willow habitat.
Buteo swainsoni	Swainson's hawk	No suitable open grassland or desert habitat, no suitable nesting trees.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	No suitable riparian habitat.
Empidonax traillii extimus	southwestern willow flycatcher	No suitable riparian or aquatic habitat.
Eremophila alpestris actia	California horned lark	No suitable sparsely vegetated grassland or desert habitat.
Haliaeetus leucocephalus	bald eagle	No suitable aquatic habitat.
Icteria virens	yellow-breasted chat	No suitable riparian habitat.
Laterallus jamaicensis coturniculus	California black rail	No suitable marshland habitat.
Pandion haliaetus	osprey	No suitable aquatic habitat.
Polioptila californica californica	Coastal California gnatcatcher	No suitable alluvial fan or coastal scrub habitat.
Setophaga petechia	yellow warbler	No suitable riparian or aquatic habitat.
Vireo bellii pusillus	least Bell's vireo	No suitable riparian habitat.
MAMMALS		
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	No suitable alluvial fan or coastal scrub habitat.
Chaetodipus fallax pallidus	pallid San Diego pocket mouse	No suitable habitat with sandy soils.
Dipodomys merriami parvus	San Bernardino kangaroo rat	No suitable alluvial fan or coastal scrub habitat.
Dipodomys stephensi	Stephens' kangaroo rat	No suitable sparsely vegetated grassland.
Glaucomys oregonensis californicus	San Bernardino flying squirrel	No suitable forest habitat and outside of geographic range.
Neotamias speciosus speciosus	lodgepole chipmunk	No suitable forest habitat and outside of geographic range.
Onychomys torridus ramona	southern grasshopper mouse	Well outside of species geographic range.
Perognathus alticolus alticolus	white-eared pocket mouse	No suitable montane habitat. Outside species range.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	No suitable alluvial fan or coastal scrub habitat.

Note:

1 Special-status species reported from the region but not addressed in this report due to habitat or geographic range.

Appendix C

Aquatic Resources Delineation Report

AQUATIC RESOURCES DELINEATION REPORT

North San Bernardino Channel Project

Prepared for

San Bernardino County
Flood Control District

Submitted by

Aspen environmental group

July 2026

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1. INTRODUCTION

This report presents the methods and results of a jurisdictional delineation of aquatic resources conducted by Aspen Environmental Group (Aspen) on behalf of the San Bernardino County Flood Control District (District). The delineation was completed to support the District's North San Bernardino Channel Project (Proposed Project or Project) which would construct a concrete rectangular channel to replace the existing rural interim channel. This report provides preliminary data on the extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Santa Ana Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW).

1.1. Project Location

The Project site is located at the North San Bernardino Channel (formerly known as Devil Creek Channel), just north of Kendall Drive, from Western Avenue to Little Mountain Basin (approximately one mile), in the City of San Bernardino, San Bernardino County, California (Attachment 1, Figure 1). The Project is located in the San Bernardino North U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Surrounding lands are dense residential developments to the north, west, and east, with approximately 1,000 acres of natural open space at Little Mountain to the south. Interstate 215 is located approximately one mile west and State Route 210 is located approximately 1.5 miles south. California State University, San Bernardino is located approximately one mile northwest of the Project site. The Project site is situated approximately two miles southwest of the San Bernardino Mountains and 3.5 miles east of Lytle Creek.

1.2. Project Description

The District proposes to construct an 8-foot-high reinforced concrete rectangular channel to replace the existing channel and three street crossings/culverts, as well as the relocation of various utilities (primarily at the street crossings). The existing rural and interim channel was constructed in the 1950s and intended to be a temporary flood control channel designed for flood protection during 25-year events upstream and 10-year events downstream. The channel improvements aim to increase flood protection to a uniform 100-year event protection, enhance protection for areas within the 100-year floodplain, and mitigate flooding risks for nearly 300 structures and over 200,000 residents.

1.3. Contact Information

San Bernardino County Flood Control District
Environmental Management Division
825 E. Third St., Rm. 123
San Bernardino, CA 92415

Maryn Mineo-Wells
Phone: (909) 387-1865
Email: Maryn.Mineo-Wells@dpw.sbcounty.gov

1.4. Site Access

Driving directions from Los Angeles to the Project are provided below in Table 1.

Table 1. Driving Directions to the Project Site

From Los Angeles, California
Take State Route 210 East to Interstate 215 North. Travel north for approximately 1.1 miles to University Parkway (Exit 48). Turn right (north) onto University Parkway, continue for approximately 1.2 miles. Turn right (east) onto Northpark Boulevard West, continue for approximately 0.75 miles. Turn right (south) on Little Mountain Drive, continue for approximately 0.7 miles. Turn left (southeast) on Kendall Drive, continue for approximately 0.15 miles. The Project site is located along Kendall Drive, in the North San Bernardino Channel, starting at Western Avenue North and continuing southeast to the Little Mountain Basin, just past H Street.

2. ENVIRONMENTAL SETTING

2.1. Regional Setting and Land Use

The Project site is in the southwestern portion of San Bernardino County. It is within the Southern California/Northern Baja Coast ecoregion, in the Inland Valleys subregion (Griffith et al., 2016). Elevation of the Project site ranges from approximately 1,325 to 1,400 feet (400 to 425 meters) above mean sea level.

The Project site occurs in an area zoned as Publicly Owned Flood Control (PFC) and Public Facility (PF) (City of San Bernardino, 2026). A portion of the channel between 3rd Avenue and H Street are designated as Commercial General (CG-1), followed by a very small portion zoned Residential Medium (RM). Surrounding lands are primarily zoned as Residential Suburban (RS), Residential Low (RL), Residential Medium High (RMH), Residential High (RH), and Commercial General (CG-1). The majority of Little Mountain is zoned as Publicly Owned Flood Control (PFC) and Commercial General (CG-1).

2.2. Existing Vegetation and Land Cover

Vegetation within the Project site was mapped by Aspen biologists Jacob Aragon, Emily Correia-Lambton, and Keziah Robles on May 7, 2026. Vegetation mapping units, descriptions, and names are typically based on alliance level nomenclature in *A Manual of California Vegetation* (Sawyer et al., 2009); however, no stands of vegetation were present and only land cover types were mapped. The land cover data is presented in Table 2 and shown in Figure 2 (Attachment 1). All plants observed within the Project site are provided in Attachment 2 and representative photos are provided in Attachment 3.

Table 2. Vegetation and Land Cover in the Project Site

Vegetation and Land Cover Types[1]	Permanent Impact (Acres)	Temporary Impact (Acres)	Total Impact (Acres)
Disturbed/Developed	3.48	1.47	**12.86**
Maintained Flood Control Channel	5.46	9.38	**6.93**
Total	**8.94**	**10.85**	**19.79**

Note:
[1] These other land cover types are not defined in Sawyer et al. (2009) but are included in this table for acreage calculation purposes.

2.2.1. Vegetation Types

No vegetation alliance of adequate size for mapping was identified on the Project site.

2.2.2. Other Land Cover Types

Two land cover types are present within the Project site and are discussed below. These land cover types do not match any cover types described in *A Manual of California Vegetation.*

Disturbed/Developed. Disturbed/Developed areas within the Project site include paved and dirt roads and other unvegetated areas. Vegetation, when present includes ruderal species such as treasure flower (*Gazania linearis*), redstem filaree (*Erodium cicutarium*), and London rocket (*Sisymbrium irio*), and scattered ornamental species such as oleander (*Nerium oleander*).

Maintained Flood Control Channel. The maintained flood control channel was used to map portions of the Project site that are routinely maintained by the District. This includes the existing channel and Little Mountain Basin. These areas are largely unvegetated with some scattered non-native species such as water speedwell (*Veronica anagallis-aquatica*), white sweetclover (*Melilotus albus*), and Russian thistle (*Salsola tragus*). Several native species are also present such as watercress (*Nasturtium officinale*), common knotweed (*Persicaria lapathifolia*), and seep monkey flower (*Erythranthe guttata*).

2.3. Climate and Precipitation

The climate in the vicinity of the Project site is Mediterranean, with hot and dry summers and cool winters. The area experiences maximum mean temperatures of 80 to 90 degrees Fahrenheit (°F) typically from June to September, and minimum mean temperatures of 30 to 40 °F typically from December to April. The average temperature ranges from the high 40s °F in the winter to mid-80s °F in the summer (CDWR, 2026).

The Project site is located in the South Coast Hydrologic Region, in the Upper Santa Ana River Watershed and the Bunker Hill Groundwater Sub-basin (CDWR, 2004; 2026). The Santa Ana River, Mill Creek, and Lytle Creek are the main tributary streams in the subbasin. Average annual precipitation ranges from 13 to 31 inches (CDWR, 2004).

As of July 2026, the South Coast Hydrologic Region had accumulated 17.5 inches of precipitation (historical average at 16.27 inches). This is approximately 108% of the historical average for the water year to date, and 100% of the average for a full water year through September 30 (CDWR, 2026). A water year is defined as October 1 through September 30.

2.4. Hydrology

The literature review included an assessment of the National Hydrography Dataset (NHD), Watershed Boundary Dataset (WBD), and National Map Viewer (USGS, 2026a; 2026b; and 2026c), the National Wetlands Inventory (NWI) Wetlands Mapper (USFWS, 2026), and the Santa Ana RWQCB Basin Plan (SARWQCB, 2025).

The NHD is managed by the USGS and defines nested hydrologic units, beginning with regions that are subdivided into subregions, basins, subbasins and watersheds, as listed below:

- Hydrologic Unit Code (HUC)-2: 18, California (8,861,368 acres).
- HUC-4: 1807, Southern California Coastal (8,861,368 acres).
- HUC-6: 180702, Santa Ana (1,779,076 acres).
- HUC-8: 18070203, Santa Ana (1,084,242 acres).
- HUC-10: 1807020303, Lytle Creek (104,089 acres).
- HUC-12: 180702030304, Cable Creek watershed (14,092 acres).

The NWI Wetlands Mapper is managed by the U.S. Fish and Wildlife Service (USFWS). It includes historic spatial data of wetlands and deepwater features and is updated twice a year. The North San Bernardino Channel in the Project site is described as Riverine habitat and is classified as R5UBF (USFWS, 2026).

- Riverine (R): The Riverine System includes all wetlands and deepwater habitats contained within a channel, defined as an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water. Two exceptions include: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 parts per thousand or greater.
- Unknown Perennial (5): This Subsystem designation is used when the distinction between lower perennial, upper perennial, and tidal cannot be made from aerial photography and no data is available.
- Unconsolidated Bottom (UB): This Class includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 centimeters), and a vegetative cover less than 30%.
- Semipermanently Flooded (F): For this Water Regime, surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

The basin adjacent to the Project site is described as Lake habitat and is classified as L1UBH (USFWS, 2026), as follows:

- Lacustrine (L): The Lacustrine System includes wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, and emergent mosses or lichens with 30 percent or greater areal coverage; and (3) total area of at least 8 hectares (ha) (20 acres). Similar wetlands and deepwater habitats totaling less than 8 ha are also included in the Lacustrine System if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin equals or exceeds 2.5 meters (8.2 feet) at low water. Lacustrine waters may be tidal or nontidal, but ocean-derived salinity is always less than 0.5 parts per thousand.
- Limnetic (1): The Limnetic Subsystem includes all deepwater habitats (i.e., areas > 2.5 meters [8.2 feet] deep below low water) in the Lacustrine System.
- Unconsolidated Bottom (UB): This Class includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 centimeters), and a vegetative cover less than 30%.
- Permanently Flooded (H): In this Water Regime, water covers the substrate throughout the year in all years.

The Project site is in the Bunker Hill-A Management Zone as defined in the Santa Ana RWQCB Basin Plan (SARWQCB, 2025). Beneficial uses identified in the Basin Plan for North San Bernardino Channel (formerly known as Devil Creek Channel (San Bernardino County, 2022)), which shares the regulatory beneficial use designations of its receiving waters (Reach 4, Santa Ana River), include:

- Municipal and Domestic Supply (MUN) waters are used for community, military, municipal or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
- Groundwater Recharge (GWR) waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality or halting saltwater intrusion into freshwater aquifers.
- Water Contact Recreation (REC1: Primary Contact Recreation) waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may

include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.

- Non-contact Water Recreation (REC2: Secondary Contact Recreation) waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing and aesthetic enjoyment in conjunction with the above activities.
- Warm Freshwater Habitat (WARM) waters support warmwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish and wildlife, including invertebrates.
- Wildlife Habitat (WILD) waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

2.5. Soils

The literature review included querying historic soil data from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to determine potential soil types within the Project site (USDA NRCS, 2026). Summaries of elevation ranges, parent material, flooding potential, and drainage classes are provided in Table 3. Soil map units within the Project site are displayed on Figure 3 (Attachment 1).

Table 3. Soil Units Occurring in the Project Site

Map Unit Symbol and Name	Description
TvC Tujunga gravelly loamy sand, 0 to 9 percent slopes	Very deep, somewhat excessively drained soils that formed in alluvium from granitic sources. Alluvial fans and floodplains, including urban areas. Negligible to low runoff and high saturated hydraulic conductivity. Flooding is none to frequent. Used for grazing, citrus, grapes, other fruits, and urban residential or commercial development; uncultivated areas have a cover of shrubs, annual grasses and forbs; in urban areas ornamentals and turf-grass are common. Found from sea level to 1,700 feet elevation.
SpC Soboba stony loamy sand, 2 to 9 percent slopes	Deep, excessively drained soils formed in alluvium from predominantly granitic rock sources. Alluvial fans and flood plains. Very slow runoff and very rapid permeability. Used mostly for pasture; native vegetation is annual grasses and forbs and chaparral shrubs. Found from 25 to 3,700 feet elevation.
HbA Hanford sandy loam, 0 to 2 percent slopes HaC Hanford coarse sandy loam, 2 to 9 percent slopes	Very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Stream bottoms, floodplains and alluvial fans. Well drained with negligible to low runoff and moderately rapid permeability. Used for growing fruits, vegetables, and general farm crops; urban development; dairies; uncultivated areas are mainly annual grasses and associated herbaceous plants. Found from 150 to 950 feet elevation.
Fr Friant-Rock outcrop complex	Shallow, well drained soils that formed in material weathered from mica schist, quartz schist and gneiss; friant soils are on mountainous uplands. Well drained; medium to very rapid runoff; moderately rapid permeability. Used principally for grazing, wildlife, and watershed; native vegetation is buckwheat, chaparral, and naturalized grasses and forbs. Found from 500 to 3,500 feet elevation.

3. REGULATORY SETTING

Jurisdictional waters, wetlands, and riparian habitat are regulated by the USACE, Santa Ana RWQCB, and CDFW. The USACE regulatory program regulates activities pursuant to Section 404 of the federal Clean Water Act (CWA); the RWQCB regulates activities under Section 401 of the CWA and the California Porter-Cologne

Water Quality Control Act; and the CDFW regulates activities under the Fish and Game Code Sections 1600-1616.

3.1. Clean Water Act Section 404

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within "Waters of the U.S." (resulting in more than incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). The definition of federally jurisdictional wetlands and "Waters of the U.S." have changed several times recently and the latest interpretation of the CWA is discussed below.

In 2020, the U.S. Environmental Protection Agency (USEPA) updated the CWA and their definition of navigable waters (USACE and USEPA, 2020). The Navigable Waters Protection Rule (NWPR) revised the definition of "Waters of the U.S." to encompass traditional navigable waters; perennial and intermittent tributaries that contribute surface waters flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. Ephemeral waters were not included in the NWPR definition of "Waters of the U.S."

In 2021, the USEPA and USACE were directed by the Biden Administration and the U.S. District Court to vacate the 2020 NWPR and revert to the pre-2020 rule. On January 18, 2023, the USEPA published the "Revised Definition of 'Waters of the United States'" (the January 2023 Rule), with a definition of "Waters of the U.S." that reutilized the 2006 Rapanos ruling's permanent and significant nexus standards (88 Fed. Reg. 3004).

On May 25, 2023, the U.S. Supreme Court decision in Sackett v. Environmental Protection Agency concluded that the significant nexus standard is inconsistent with the CWA (*Sackett et ux. v. Environmental Protection Agency et al*., 598 U.S. 651 [2023]). On September 8, 2023, the USACE and USEPA published the final rule to amend the January 2023 Rule and define "Waters of the U.S." as follows, once again not including ephemeral waters (88 Fed. Reg. 61964):

- Traditional navigable waters, the territorial seas, and interstate waters (referred to as "(a)(1) waters").
- Impoundments of "Waters of the U.S.", other than impoundments of waters identified under paragraph (a)(5) (referred to as "(a)(2) waters").
- Tributaries to traditional navigable waters, the territorial seas, and interstate waters that are relatively permanent, standing or continuously flowing bodies of water (referred to as "(a)(3) waters" or "jurisdictional tributaries").
- Wetlands adjacent to and having a continuous surface connection with (a)(1) waters or relatively permanent, standing or continuously flowing (a)(2) waters (referred to as "jurisdictional adjacent wetlands").
- Intrastate lakes and ponds not identified as (a)(1) through (4) waters that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to (a)(1) or (a)(3) waters.

3.2. Porter-Cologne Water Quality Control Act and Clean Water Act Section 401

The RWQCBs regulate activities affecting 'Waters of the State' according to the Porter-Cologne Water Quality Control Act and Section 401 of the federal CWA. The Project site is within the jurisdictional boundaries of the Santa Ana RWQCB. The Porter-Cologne Act defines waters of the State as all surface and subsurface waters. The RWQCBs may issue permits (called Waste Discharge Requirements or WDRs) or may issue a waiver for a

given application. In addition, the RWQCB recently started to implement a new regulatory program for all waters of the State.

On April 2, 2019, the State Water Resources Control Board (SWRCB) adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to waters of the State. The adopted definitions and procedure allow for the presence of hydric substrates as a criterion for wetland identification (not just wetland soils) and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland. Waters of the State are typically delineated based on the ordinary high-water mark (OHWM) in the field as defined by federal guidelines (SWRCB, 2021, see also USACE, 2008a) as the limits of jurisdiction. However, waters of the State include isolated waters and need not have downstream surface connection to federally jurisdictional waters. The new program uses the soils, hydrology, and vegetation criteria to identify wetlands, but may define certain unvegetated sites (e.g., mud flats or playas) as wetlands based on only the soils and hydrology criteria. The definition of "Waters of the State" excludes certain types of artificial wetlands greater than or equal to one acre in size, including, but not limited to, those constructed and currently used and maintained for "detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program" (SWRCB, 2021).

In 2023, USEPA published a final rule revising and replacing the 2020 regulatory requirements for water quality certification under CWA section 401. This final rule updates the existing regulations to better align with the statutory text and purpose of the CWA; to clarify, reinforce, and provide a measure of consistency with elements of section 401 certification practice that have evolved over the more than 50 years since USEPA first promulgated water quality certification regulations; and to support an efficient and predictable certification process that is consistent with the water quality protection and cooperative federalism principles central to CWA section 401 (USEPA, 2023).

Section 401 of the CWA requires that:

> *…any applicant for a Federal permit for activities that involve a discharge to "waters of the State," shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act.*

Therefore, before the USACE may issue a Section 404 permit, a permittee must apply for and receive a Section 401 Water Quality Certification from the RWQCB. The RWQCB may add conditions to their certification to remove or mitigate potential impacts to water quality standards.

3.3. California Fish and Game Code Section 1602

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, to first notify the CDFW of the proposed project. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and water courses having a surface or subsurface flow that support or have supported riparian vegetation. Based on the notification materials submitted, the CDFW will determine if the proposed project may impact fish or wildlife resources.

If the CDFW determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (SAA) will be required. An environmental review

document completed in accordance with the California Environmental Quality Act (CEQA) must be submitted to CDFW before a SAA will be issued.

4. WATERS AND WETLANDS DELINEATION METHODOLOGY

The assessment of jurisdictional wetlands, waters of the U.S., waters of the State, and other jurisdictional habitats was conducted by Aspen biologists Jacob Aragon, Emily Correia-Lambton, and Keziah Robles on May 7, 2026. Prior to conducting the field assessment, Mr. Aragon reviewed current and historic aerial photographs (Google Earth Pro, 2026), the San Bernardino County Soil Survey (USDA NRCS, 2026), and the local and state hydric soil list (USDA NRCS, 2026) to evaluate the potential active channels and wetland features in the Project site. Mr. Aragon also reviewed the NWI (USFWS, 2026) and the 2022 wetland plant ratings in the National Wetland Plant List (USACE, 2022).

Site maps were generated with available aerial photographs and potentially jurisdictional features were identified and marked with lines and global positioning system (GPS) coordinates to assist in field verification. During the field assessment, vegetation and hydrology were mapped using a high-accuracy GPS unit and were identified on aerial photographs. Field maps were digitized using Geographic Information System (GIS) and total state and federal jurisdictional areas were calculated (Figure 4, Attachment 1). Representative site photos were captured during the survey and are included in this report (Attachment 3).

OHWM and wetland determination data were collected along three transects of North San Bernardino Channel, including one approximately 0.24 miles downstream of Western Avenue, the second approximately 336 feet downstream of Mountain Drive, and a third approximately 110 feet upstream from North F Street. Arid West datasheets are provided in Attachment 4. The sections below outline the standard methodology utilized in delineating a potential jurisdictional aquatic feature and represent the methods used by the Aspen biologists where aquatic features were observed.

4.1. USACE Non-Wetland Waters of the U.S.

Potential jurisdictional non-wetland waters of the U.S. are delineated based on the limits of the OHWM as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. In the Arid West region, the OHWM indicates the limits of high flows in low- to moderate-discharge events (USACE, 2008a; 2010). See Tables 1 and 2 in Attachment 5 for a list of key physical features used for determining the OHWM identified by the Arid West manual.

4.2. USACE Wetland Waters of the U.S.

Potential jurisdictional wetland waters of the U.S. are delineated using a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008b) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils (USACE, 1987; 2008b; and 2024). In addition, a visual field and aerial photograph assessment of potential surface water connectivity is completed to determine if potential federal wetlands have a surface water connection to a water of the U.S.

4.3. RWQCB Waters of the State and State Wetlands Definition

Potential jurisdictional waters of the State are generally delineated based on the limits of the OHWM as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. If waters of the U.S. are not present, the RWQCB may exert jurisdiction that matches the jurisdiction of CDFW, under the Porter Cologne Water Quality Control Act. Wetlands of the State are generally delineated based on three wetland parameters similar to the USACE methodology. In

addition, the RWQCB can take jurisdiction over wetlands of the State lacking vegetation if the area has hydric substrates and wetland hydrology present.

4.4. CDFW Jurisdictional Streambeds

CDFW jurisdiction streambeds are delineated to the top of the banks of a channel. In addition, CDFW jurisdiction can be extended to the outer drip line of adjacent riparian vegetation, when present. CDFW has jurisdiction over a larger area than the federal jurisdiction, therefore the total acreage of CDFW jurisdictional streambeds includes all federally jurisdictional waters of the U.S., where present, as well as additional adjacent state jurisdictional features, where present.

5. RESULTS

The Project site contains three drainage features consisting of the North San Bernardino Channel (Feature 1), Western Avenue Channel (Feature 2), and an unnamed earthen channel (Feature 3) near the downstream portion of the Project site which merges with North San Bernardino Channel as it enters Little Mountain Basin (Figure 4, Attachment 1). The three drainage features are ephemeral and dry up following rainfall events. Table 4 provides a summary of the acreage of the features and potential jurisdiction.

Table 4. Measurements and Classification of Potential Jurisdictional Features

	USACE Waters of the U.S.	RWQCB Waters of the State			CDFW Streambeds			Drainage Length (Linear Feet)
Drainage Feature	Total (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)	Total Impact (Acres)	Permanent Impact (Acres)	Temporary Impact (Acres)	Total Impact (Acres)	
Feature #1 (North San Bernardino Channel)	--	2.94	0.63	3.56	5.56	1.31	6.87	5,645
Feature #2 (Western Avenue Channel)	--	--	0.04	0.04	--	0.04	0.04	62
Feature #3 (Unnamed Channel)	--	0.03	0.05	0.08	0.09	0.22	0.31	233
Total:	**--**	**2.96**	**0.72**	**3.69**	**5.65**	**1.58**	**7.23**	**--**

Note: Values that are zero or absent are indicated with a double dash.

Feature #1 (North San Bernardino Channel). This feature is the North San Bernardino Channel, the primary channel at the Project site. It flows from northwest to southeast during rain events. The channel is expected to fall under the jurisdiction of the RWQCB and CDFW.

Feature #2 (Western Avenue Channel). This feature is the Western Avenue Channel and flows only during rain events from north to south, adjacent to Western Avenue, and feeds into the primary channel in the northwestern portion of the Project site. The concrete channel is expected to fall under the jurisdiction of the RWQCB and CDFW.

Feature #3 (Unnamed Channel). This feature flows from west to east and feeds into the primary channel along the southern, downstream end of the Project site. It emerges from a concrete channel underground and flows only during rain events. The channel is expected to fall under the jurisdiction of the RWQCB and CDFW.

5.1. USACE Non-Wetland Waters of the U.S.

Based on the assessment of hydrology and the limits of the OHWM as determined by aerial imagery, evidence of flow, changes in physical and biological features (i.e., bank erosion, sorted sediments, deposited vegetation or debris), and vegetative characteristics, none of the aquatic resources within the Project site are expected to fall under the jurisdiction of the USACE. This is largely based on the lack of relatively permanent water within these aquatic resources.

5.2. USACE Wetland Waters of the U.S.

Based on assessment of hydrology, vegetation, and soils during the field surveys, wetland waters of the U.S. are also absent from the Project site.

5.3. RWQCB Waters and Wetlands of the State

Based on an assessment of hydrology and the limits of the OHWM as determined by aerial imagery, evidence of flow, changes in physical and biological features, and vegetative characteristics, the primary channel (Feature 1) and two interconnecting channels (Features 2 and 3) within the Project site are expected to fall under the jurisdiction of the RWQCB as non-wetland waters of the State.

5.4. CDFW Jurisdictional Streambeds

Based on assessment of hydrology and the presence of bed and bank, all aquatic resources mapped within the Project site are expected to meet the definition of CDFW jurisdictional streambeds as outlined in Sections 1600-1616 of the California Fish and Game Code. As described above, this includes the two interconnecting channels in the Project site (Features 2 and 3) and the primary channel (Feature 1).

6. SUMMARY AND CONCLUSIONS

A total of three aquatic resources were mapped within the Project site (Figure 4, Attachment 1). This includes a total of 3.69 acres of RWQCB waters of the State and 7.23 acres of CDFW jurisdictional streambeds. No features were considered wetlands or waters of the U.S. under USACE jurisdiction. Based on Proposed Project impacts, it is anticipated that regulatory permits from the RWQCB and CDFW will need to be obtained prior to the start of this Project. The conclusions presented above represent Aspen's professional opinion based on our knowledge and experience with the USACE, RWQCB, and CDFW, including the applicable regulatory guidance documents and manuals. However, the USACE, RWQCB, and CDFW have final authority in determining the status and presence of jurisdictional wetlands and waters and the extent of their boundaries.

7. LITERATURE CITED

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, D.H. Wilken, eds. 2012. The Jepson Manual: Vascular Plants of California, 2nd ed. University Press, Berkeley, California.

CDWR (California Department of Water Resources). 2026. California Water Watch. [Online]: https://cww.water.ca.gov/. Last accessed: May 2026.

_____. 2004. California's Groundwater Bulletin 118; Hydrologic Region South Coast, Upper Santa Ana Valley Groundwater Basin.

City of San Bernardino. 2026. Public Zoning Map. Planning Division. Available at: https://sbcity.maps.arcgis.com/home/index.html.

Google Earth Pro (Version 7.3.6.10201). 2026. Aerial Imagery for San Bernardino, California.

Griffith et al. (Griffith, G.E., J.M. Omernik, D.W. Smith, T.D. Cook, E. Tallyn, K. Moseley, and C.B. Johnson). 2016. Ecoregions of California (poster). U.S. Geological Survey Open-File Report 2016-1021, with map, scale 1:1,100,00. Online: https://www.usgs.gov/publications/ecoregions-california. Last accessed: June 2026.

Jepson eFlora. 2026. Jepson Flora Project. [Online]: https://ucjeps.berkeley.edu/eflora/. Last accessed: May 2026.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: national summary. U.S. Fish and Wildlife Service Biology Report 88(24). 244pp.

San Bernardino County. 2022. Multi-jurisdictional Hazard Mitigation Plan. December. Available at: https://www.sbcounty.gov/uploads/SBCFire/documents/EmergencyServices/Hazard-Mitigation-Plan-202212.pdf.

SARWQCB (Santa Ana Regional Water Quality Control Board). 2025. Water Quality Control Plan: Santa Ana River Basin. Adopted 1995. Updated 2025. Online: https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/. Last accessed: May 2026.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evans. 2009. Manual of California Vegetation, 2nd ed. California Native Plant Society, Sacramento, California. 1300 pp.

SWRCB (State Water Resources Control Board). 2021. State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. Adopted April 2, 2019, revised April 6, 2021. Online: https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf. Last accessed: May 2026.

USACE (U.S. Army Corps of Engineers). 2026. National Wetland Plant List. Interagency online publication led by USACE with support from U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture – Natural Resources Conservation Service. Online: https://wetland-plants.sec.usace.army.mil/. Last accessed: June 2026.

_____. 2024. Wetland Determination Data Sheet – Arid West Region. Arid West V. 2.0. ENG FORM 6116-1, September 2024. Expires September 30, 2027.

_____. 2022. National Wetland Plant List, Arid West Region, version 3.6. U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://wetland-plants.usace.army.mil/. Last accessed: May 2026.

_____. 2010. Updated Datasheet for the Identification of the Ordinary High Water Mark ({OHWM) in the Arid West Region of the Western United States, ed. K.E. Curtis and R.W. Lichvar. ERDC/CRREL TN-10-1. Hanover, NH: U.S. Army Engineer Research and Development Center.

_____. 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, ed. R.W. Lichvar and S.M. McColley. ERDC/CRREL TR- 08-12. Hanover, NH: U.S. Army Engineer Research and Development Center.

_____. 2008b. Regional Supplement to the U.S Army Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____. 1987. U.S. Army Cops Wetland Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS.

USACE and USEPA (U.S. Environmental Protection Agency). 2020. The Navigable Waters Protection Rule: Definition of "Waters of the United States." Final rule, prepublication copy issued January 23, 2020, pending publication in Federal Register. https://www.epa.gov/sites/production/files/2020-01/documents/navigable_waters_protection_rule_prepbulication.pdf. Last accessed: May 2026.

USDA NRCS (U.S. Department of Agriculture, Natural Resources Conservation Service). 2026. Web Soil Survey. Online: https://websoilsurvey.nrcs.usda.gov/app/. Last accessed: May 2026.

USEPA (U.S. Environmental Protection Agency). 2023. Clean Water Act Section 401 Water Quality Certification Improvement Rule; Final Rule. Federal Register 88:66558-66666 (September 27).

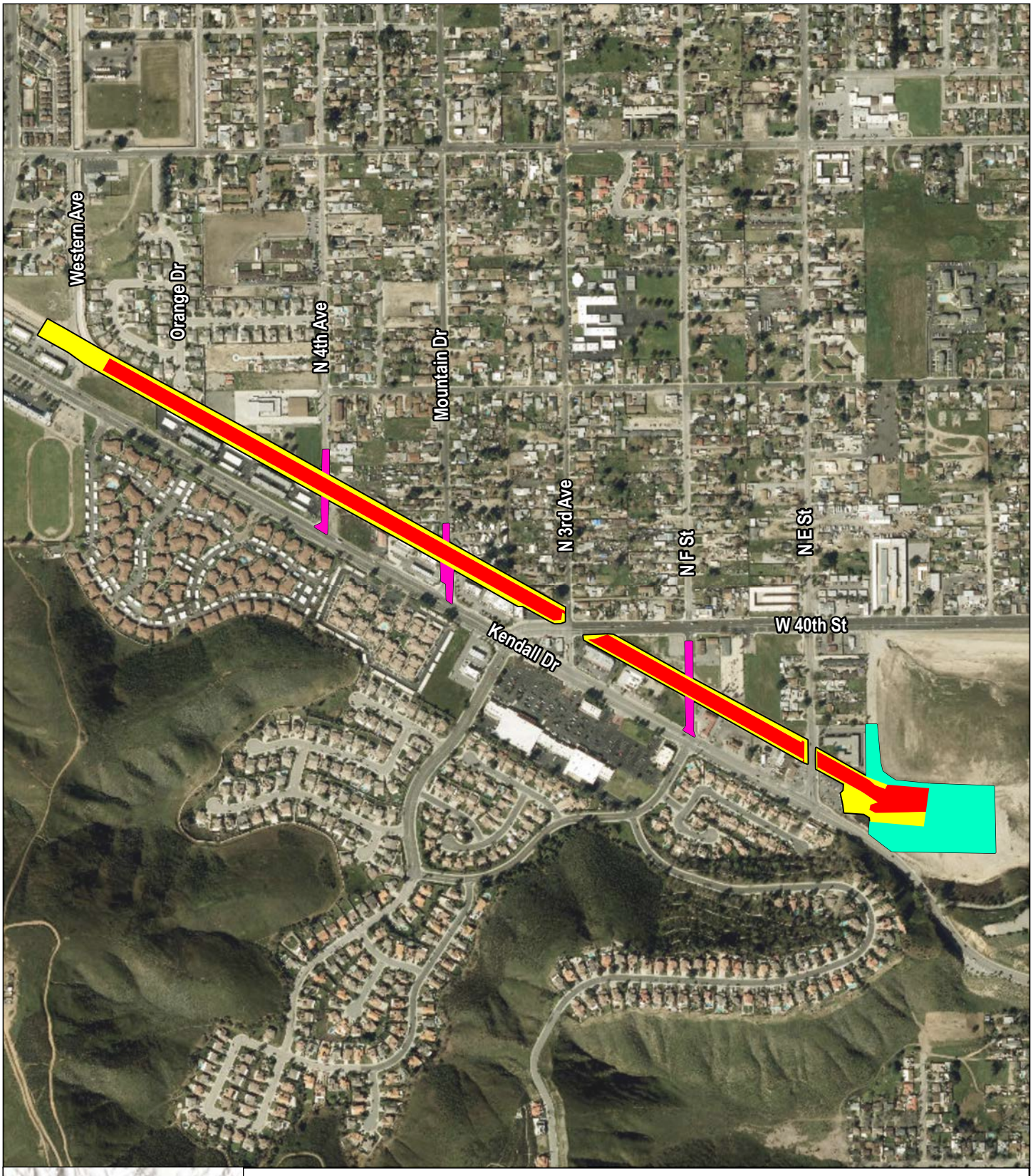
USFWS (U.S. Fish and Wildlife Service). 2026. National Wetland Inventory, Wetland Mapper. https://www.fws.gov/wetlands/Data/Mapper.html. Last accessed: May 2026.

USGS (U.S. Geological Survey). 2026a. National Hydrography Dataset. https://www.usgs.gov/national-hydrography/national-hydrography-dataset. Last accessed: May 2026.

_____. 2026b. Watershed Boundary Dataset. Available at: https://www.usgs.gov/national-hydrography/watershed-boundary-dataset. Last accessed: May 2026.

_____. 2026c. National Map Viewer. Available at: https://apps.nationalmap.gov/viewer/. Last accessed: May 2026.

Attachment 1
FIGURES



San Bernardino County

Project Location

Project Area
Permanent Disturbance Area
Pavement Rehabilitation (Temporary Disturbance)
Staging Area (Temporary Disturbance)
Temporary Construction Area

0 500 1,000 feet

Figure 1

Project Overview

Sources: County of San Bernardino, 2026; Esri, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



Figure 2

Vegetation and Land Cover

Project Area

Cover Type

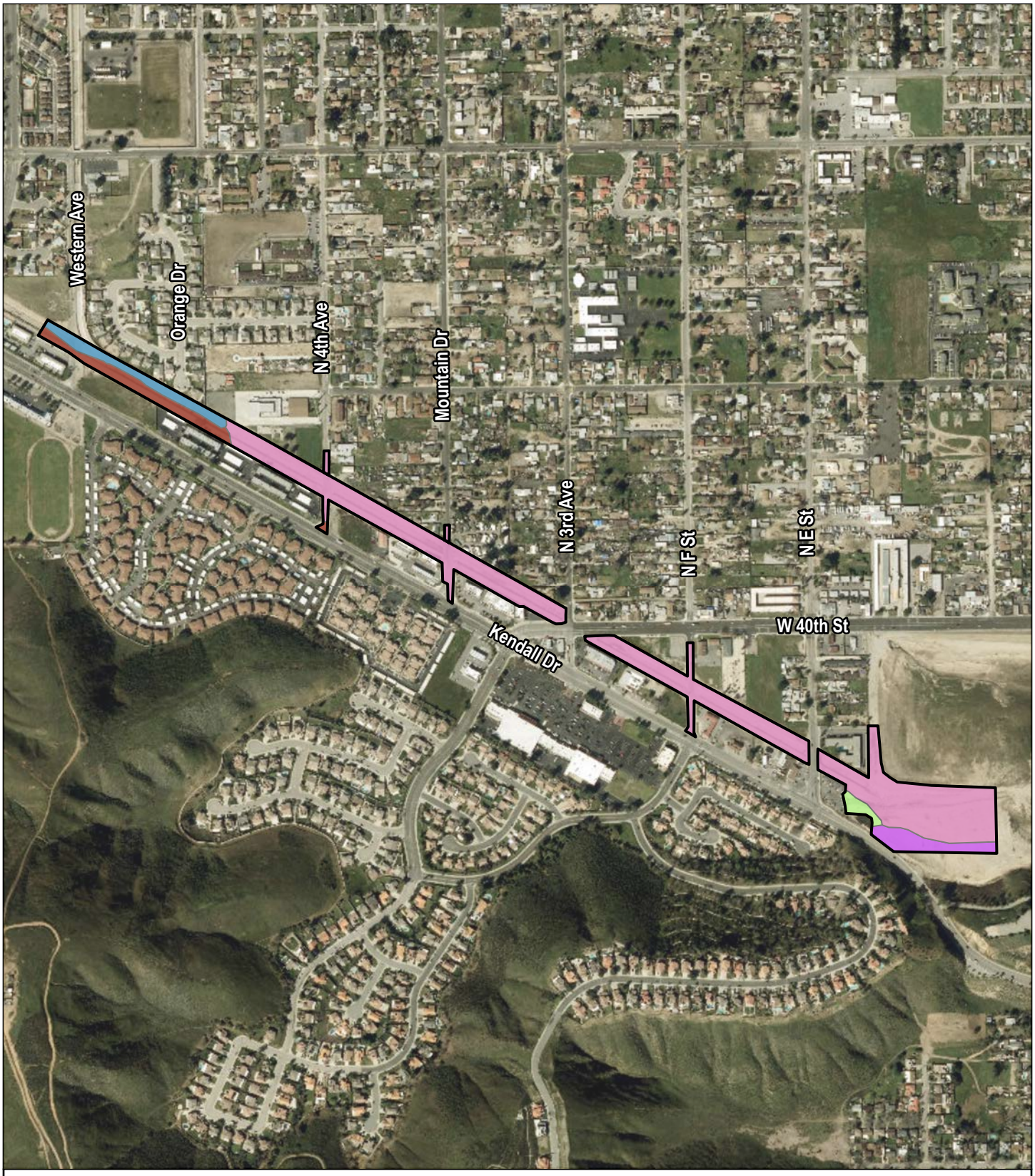
CDFW Maintaned Flood Control Channel

Disturbed / Developed

0 500 1,000 feet

Sources: County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



Soils

- Friant-Rock outcrop complex
- Hanford coarse sandy loam, 2 to 9 percent slopes
- Hanford sandy loam, 0 to 2 percent slopes
- Soboba stony loamy sand, 2 to 9 percent slopes
- Tujunga gravelly loamy sand, 0 to 9 percent slopes

Project Area

0 500 1,000 feet

Figure 3

Soils

Sources: USDA NRCS, 2026; County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.



N

OHWM Transect
Project Area
CDFW Waters
RWQCB Waters

0 500 1,000 feet

Figure 4

Aquatic Resources

Sources: County of San Bernardino, 2026; Esri, 2026; Aspen, 2026.

This product reflects geospatial analysis only and is not a substitute for authoritative boundary determinations.

Attachment 2

OBSERVED PLANT SPECIES LIST AND WETLAND INDICATOR STATUS

Observed Plant Species List and Wetland Indicator Status

Latin Name	Common Name	Wetland Indicator Status (Arid West)
ADOXACEAE	MUSKROOT FAMILY	
Sambucus nigra ssp. *cerulea (S. mexicana)*	Mexican elderberry, blue elderberry	NL
APOCYNACEAE	DOGBANE FAMILY	
* *Nerium oleander*	Oleander	NL
ASTERACEAE	ASTER FAMILY	
Ambrosia acanthicarpa	Annual bur-sage, annual sandbur	NL
Ambrosia psilostachya	Western ragweed	FACU
Baccharis salicifolia	Mule fat	FAC
Erigeron canadensis	Canada horseweed	FACU
* *Gazania linearis*	Treasure flower	NL
* *Hedypnois cretica*	Crete weed, Crete hedypnois	NL
Helianthus annuus	Western sunflower	FACU
* *Lactuca serriola*	Prickly lettuce	FACU
Lepidospartum squamatum	Scale-broom	FACU
Pseudognaphalium californicum	California everlasting	NL
Xanthium strumarium	Cocklebur	FAC
BRASSICACEAE	MUSTARD FAMILY	
* *Brassica fruticulosa*	Mediterranean cabbage	NL
* *Brassica nigra*	Black mustard	NL
* *Capsella bursa-pastoris*	Shepherd's purse	FACU
Nasturtium officinale	Water cress	OBL
* *Sisymbrium irio*	London rocket	NL
CHENOPODIACEAE	GOOSEFOOT FAMILY	
* *Chenopodium album*	Lamb’s quarters	FACU
* *Salsola tragus*	Russian thistle	FACU
EUPHORBIACEAE	SPURGE FAMILY	
Croton californicus	California croton	NL
FABACEAE	LEGUME FAMILY	
Acmispon americanus	Spanish clover	UPL
Acmispon glaber	Deerweed	NL
* *Melilotus albus*	White sweet clover	FACU
* *Melilotus officinalis*	Yellow sweet clover	FACU
* *Vicia villosa*	Winter vetch	NL
GERANIACEAE	GERANIUM FAMILY	
* *Erodium cicutarium*	Redstem filaree	NL
LAMIACEA	SAGE FAMILY	
* *Marrubium vulgare*	Horehound	FACU
Salvia apiana	White sage	NL
MALVACEAE	MALLOW FAMILY	
* *Malva parviflora*	Cheeseweed	NL
MYRSINACEAE	MYRSINE FAMILY	

Observed Plant Species List and Wetland Indicator Status

Latin Name	Common Name	Wetland Indicator Status (Arid West)
* *Anagallis arvensis*	Scarlet pimpernel	FAC
ONAGRACEAE	PRIMROSE FAMILY	
Camissoniopsis bistorta	California sun cup	NL
* *Oenothera laciniata*	Cut-leaf evening primrose	FAC
OXALIDACEAE	OXALIS FAMILY	
* *Oxalis corniculata*	Yellow sorrel	FACU
PHRYMACEAE	LOPSEED FAMILY	
Erythranthe guttata	Seep monkeyflower	OBL
PLANTAGINACEAE	PLANTAIN FAMILY	
* *Veronica anagallis-aquatica*	Water speedwell	OBL
POLYGONACEAE	BUCKWHEAT FAMILY	
Eriogonum fasciculatum	California buckwheat	NL
Persicaria lapathifolia	Common knotweed	FACW
* *Rumex crispus*	Curly dock	FAC
SIMAROUBACEAE	QUASSIA or SIMAROUBA FAMILY	
* *Ailanthus altissima*	Tree of heaven	FACU
SOLANACEAE	NIGHTSHADE FAMILY	
Datura wrightii	Jimsonweed, tolguacha	UPL
* *Nicotiana glauca*	Tree tobacco	FAC
* *Solanum nigrum*	Black nightshade	FACU
URTICACEAE	NETTLE FAMILY	
* *Urtica urens*	Dwarf nettle	NL
Monocotyledons		
ARECACEAE	PALM FAMILY	
* *Washingtonia robusta*	Mexican fan palm	FACW
CYPERACEAE	SEDGE FAMILY	
* *Cyperus involucratus*	Umbrella sedge	FACW
POACEAE	GRASS FAMILY	
* *Avena barbata*	Slender wild oat	NL
* *Avena fatua*	Wild oat	NL
* *Bromus diandrus*	Ripgut brome	NL
* *Bromus madritensis*	Foxtail chess	UPL
* *Bromus rubens*	Red brome	NL
* *Bromus tectorum*	Cheat grass	NL
* *Echinochloa colona*	Jungle-rice	FAC
* *Polypogon monspeliensis*	Rabbitfoot grass	FACW
* *Schismus barbatus*	Mediterranean schismus	NL

Note:
Non-native species indicated by asterisk; special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season (many plants are identifiable only in spring). Plants were identified using keys, descriptions, and illustrations in Baldwin et al. (2012). Taxonomy and nomenclature generally follow Jepson eflora (2026).

Observed Plant Species List and Wetland Indicator Status

Latin Name	Common Name	Wetland Indicator Status (Arid West)
Wetland Status Key (USACE 2026)		
OBL (Obligate): Almost always occur in wetlands.		
FACW (Facultative Wetland): Usually occur in wetlands, but may occur in non-wetlands.		
FAC (Facultative): Occur in wetlands and non-wetlands.		
FACU (Facultative Upland): Usually occur in non-wetlands, but may occur in wetlands.		
UPL (Upland): Almost never occur in wetlands.		
NL (Not Listed): Not listed by the National Wetlands Plant List.		

Attachment 3

PHOTO EXHIBIT



Photo 1. Northwestern end of the Project site facing downstream within the primary channel on May 7, 2026.



Photo 2. Northwestern end of the Project site facing upstream towards the concrete channel near Western Avenue on May 7, 2026.



Photo 3. Transect 1 OHWM delineation site facing northeast on May 7, 2026.



Photo 4. Upstream view of the primary channel facing Mountain Drive (Arizona crossing) on May 7, 2026.



Photo 5. Downstream view of the primary channel facing North 3rd St on May 7, 2026.



Photo 6. Downstream view of the primary channel from West 40th St on May 7, 2026.



Photo 7. Upstream view of the primary channel facing North F St on May 7, 2026.



Photo 8. Downstream view of the primary channel facing North E St on May 7, 2026.



Photo 9. Upstream view of the primary channel facing North E St on May 7, 2026.



Photo 10. Downstream view of the southern unnamed channel facing the confluence with the primary channel on May 7, 2026.



Photo 11. Upstream view of the confluence between the primary channel (right) and the southern unnamed channel (left) on May 7, 2026.



Photo 12. Downstream view from the confluence between the primary channel and the southern unnamed channel facing the Project limts on May 7, 2026.

Attachment 4

ARID WEST ORDINARY HIGH-WATER MARK (OHWM) DATASHEETS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: North San Bernardino Channel Project
Date: May 7, 2026
Time: 11:37 AM
Project Number: 3711.001
Town: San Bernardino
State: California
Stream: Unnamed Flood Control Channel
Photo begin file#: 8-1
Photo end file#: 12-22
Investigator(s): Jacob Aragon, Emily Correia-Lambton, Keziah Robles

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

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Transect 1, located approximately 0.24-mile downstream of Western Ave.

Projection: UTM **Datum:** WGS84
Coordinates: 34.167185°N, -117.310051°W

Potential anthropogenic influences on the channel system:

Anthropogenic influences on the channel include several at-grade paved roads (Arizona crossings), trash and debris from nearby urban areas, and a high-occupancy of homeless persons with encampments.

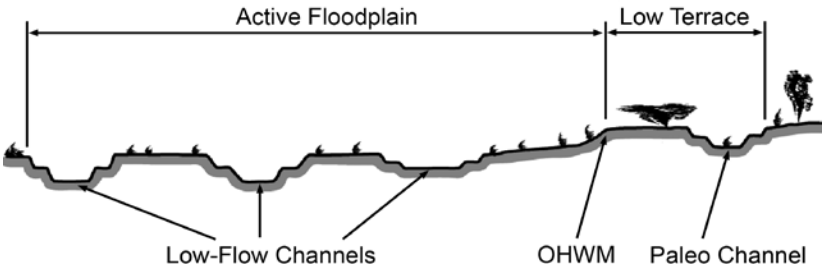
Brief site description:

The flood control channel is an engineered, single-thread, dry earthen channel. It has a relatively flat bottom, with no low-flow channel, and a substrate consisting of sand and cobbles. Rip-rap has been placed along its edges leading to a nonvegetated, compacted bank on each side.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 5/1994 - 6/2025
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



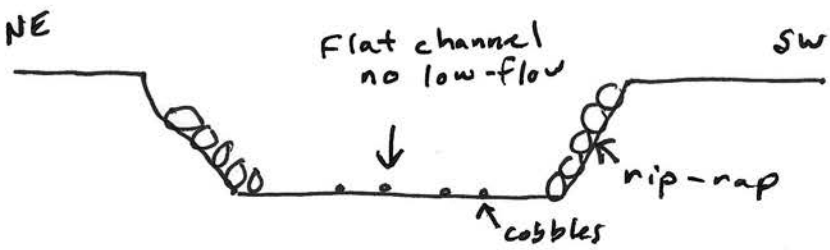
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

Project ID: 3711.001 **Cross section ID:** Transect 1 **Date:** 5/7/2026 **Time:** 11:37 AM

Cross section drawing:

Facing Downstream



OHWM

GPS point: 34.167221°N, -117.310026°W

Indicators:

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

Comments:

Little to no vegetation along the active floodplain with an increase in vegetation along the low terrace and no vegetation along the channel banks. Vegetation litter and trash identified along wrack line following the OHWM.

Floodplain unit:

☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.167185°N, -117.310051°W

Characteristics of the floodplain unit:

Average sediment texture: sandy loam

Total veg cover: 1 % Tree: 0 % Shrub: 0 % Herb: 1 %

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: Wrack line
- ☐ Other: _____
- ☐ Other: _____

Comments:

There is currently no water in the active floodplain. Cobbles are present within sandy areas of the substrate. Drift and debris composed of vegetation litter and trash forms a wrack line along the OHWM.

Project ID: 3711.001 **Cross section ID:** Transect 1 **Date:** 5/7/2026 **Time:** 11:37 AM

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

GPS point: 34.167241°N, -117.310012°W

Characteristics of the floodplain unit:

Average sediment texture: Coarse sand

Total veg cover: 0 % 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:

Gabion held channel with rip-rap placed along the low terrace of the channel. Banks have been compacted and contain no vegetation.

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:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: North San Bernardino Channel Project
Date: May 7, 2026
Time: 10:45 AM
Project Number: 3711.001
Town: San Bernardino
State: California
Stream: Unnamed Flood Control Channel
Photo begin file#: 3-1
Photo end file#: 7-11
Investigator(s): Jacob Aragon, Emily Correia-Lambton, Keziah Robles

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

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Transect 2, located approximately 336-feet downstream of Mountain Dr.

Projection: UTM **Datum:** WGS84
Coordinates: 34.165290°N, -117.306035°W

Potential anthropogenic influences on the channel system:

Anthropogenic influences on the channel include several at-grade paved roads (Arizona crossings), trash and debris from nearby urban areas, and a high-occupancy of homeless persons with encampments.

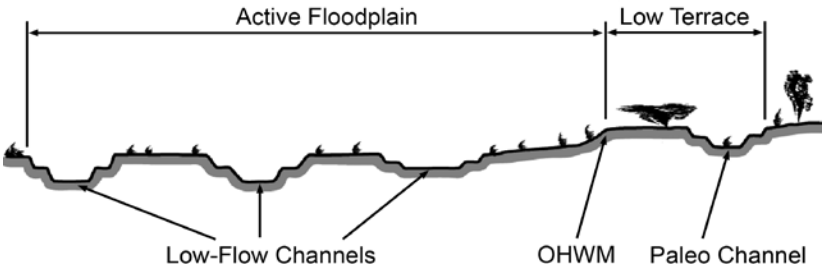
Brief site description:

The flood control channel is an engineered, single-thread, dry earthen channel. It has a relatively flat bottom, with no low-flow channel, and a substrate consisting of sand, gravel, and cobbles. Rip-rap has been placed along its edges leading to a nonvegetated, compacted bank on each side.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 5/1994 - 6/2025
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

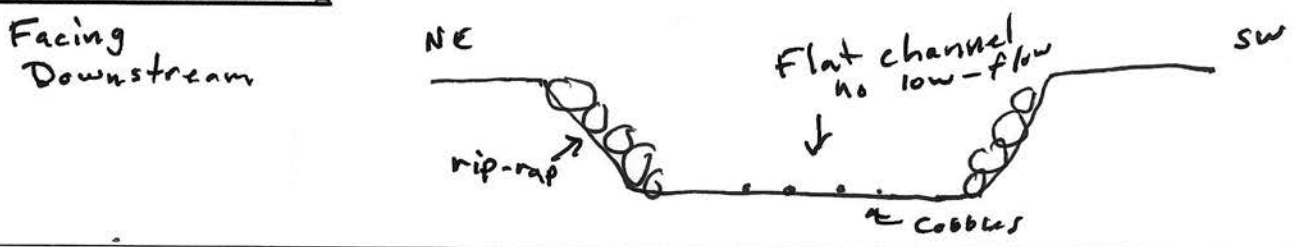


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

Project ID: 3711.001 **Cross section ID:** Transect 2 **Date:** 5/7/2026 **Time:** 10:45 AM

Cross section drawing:



OHWM

GPS point: 34.165326°N, -117.306010°W

Indicators:

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

Comments:

Little to no vegetation along the active floodplain with an increase in vegetation along the low terrace and no vegetation along the channel banks. Vegetation litter and trash identified along wrack line following the OHWM.

Floodplain unit:

☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.165290°N, -117.306035°W

Characteristics of the floodplain unit:

Average sediment texture: sandy loam

Total veg cover: 1 % Tree: 0 % Shrub: 0 % Herb: 1 %

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: Wrack line
- ☐ Other: _____
- ☐ Other: _____

Comments:

There is currently no water in the active floodplain. Cobbles are present within sandy areas of the substrate. Drift and debris composed of vegetation litter and trash forms a wrack line along the OHWM.

Project ID: 3711.001 **Cross section ID:** Transect 2 **Date:** 5/7/2026 **Time:** 10:45 AM

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

GPS point: 34.165343°N, -117.305999°W

Characteristics of the floodplain unit:

Average sediment texture: coarse sand

Total veg cover: 0 % 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:

Gabion held channel with rip-rap placed along the low terrace of the channel. Banks have been compacted and contain no vegetation.

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:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: North San Bernardino Channel Project
Project Number: 3711.001
Stream: Unnamed Flood Control Channel
Date: May 7, 2026
Town: San Bernardino
Photo begin file#: 1-1
Time: 9:45 AM
State: California
Photo end file#: 32-69
Investigator(s): Jacob Aragon, Emily Correia-Lambton, Keziah Robles

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

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Transect 3, located approximately 110-feet upstream of North F St.

Projection: UTM **Datum:** WGS84
Coordinates: 34.163840°N, -117.302961°W

Potential anthropogenic influences on the channel system:

Anthropogenic influences on the channel include several at-grade paved roads (Arizona crossings), trash and debris from nearby urban areas, and a high-occupancy of homeless persons with encampments.

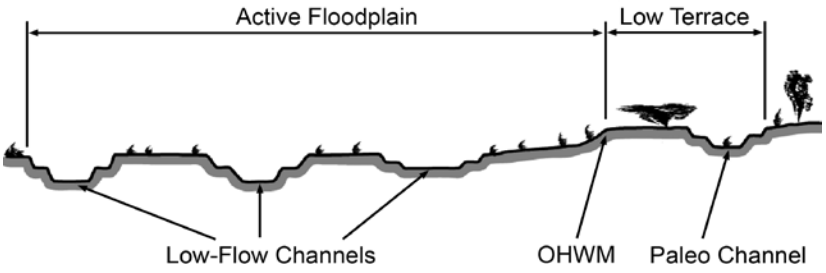
Brief site description:

The flood control channel is an engineered, single-thread, dry earthen channel. It has a relatively flat bottom, with no low-flow channel, and a substrate consisting of sand, gravel, and cobbles. Rip-rap has been placed along its edges leading to a nonvegetated, compacted bank on each side.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 5/1994 - 6/2025
- ☒ 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



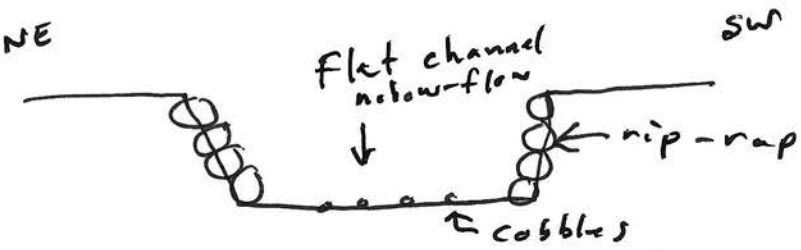
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1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.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

Project ID: 3711.001 **Cross section ID:** Transect 3 **Date:** 5/7/2026 **Time:** 9:45 AM

Cross section drawing:

Facing downstream



OHWM

GPS point: 34.163875°N, -117.302937°W

Indicators:

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

Comments:

Little to no vegetation along the active floodplain with an increase in vegetation along the low terrace and no vegetation along the channel banks. Vegetation litter and trash identified along wrack line following the OHWM.

Floodplain unit:

☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 34.163840°N, -117.302961°W

Characteristics of the floodplain unit:

Average sediment texture: sandy loam

Total veg cover: 1 % Tree: 0 % Shrub: 0 % Herb: 1 %

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: Wrack line
- ☐ Other: _____
- ☐ Other: _____

Comments:

There is currently no water in the active floodplain. Cobbles are present within sandy areas of the substrate. Drift and debris composed of vegetation litter and trash forms a wrack line along the OHWM.

Project ID: 3711.001 **Cross section ID:** Transect 3 **Date:** 5/7/2026 **Time:** 9:45 AM

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

GPS point: 34.163905°N, -117.302917°W

Characteristics of the floodplain unit:

Average sediment texture: coarse sand

Total veg cover: 0 % 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:

Rip-rap has been placed along the low terrace of the channel. Banks have been compacted and contain no vegetation.

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:

Attachment 5

FEDERAL NON-WETLAND AND WETLAND WATERS INDICATOR INFORMATION

Table 1. Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West

(A) Below OHW	(B) At OHW	(C) Above OHW
1. In-stream dunes	1. Valley flat	1. Desert pavement
2. Crested ripples	2. Active floodplain	2. Rock varnish
3. Flaser bedding	3. Benches: low, mid, most prominent	3. Clast weathering
4. Harrow marks	4. Highest surface of channel bars	4. Salt splitting
5. Gravel sheets to rippled sands	5. Top of point bars	5. Carbonate etching
6. Meander bars	6. Break in bank slope	6. Depositional topography
7. Sand tongues	7. Upper limit of sand-sized particles	7. Caliche rubble
8. Muddy point bars	8. Change in particle size distribution	8. Soil development
9. Long gravel bars	9. Staining of rocks	9. Surface color/tone
10. Cobble bars behind obstructions	10. Exposed root hairs below intact soil layer	10. Drainage development
11. Scour holes downstream of obstructions	11. Silt deposits	11. Surface relief
12. Obstacle marks	12. Litter (organic debris, small twigs and leaves)	12. Surface rounding
13. Stepped-bed morphology in gravel	13. Drift (organic debris, larger than twigs)	
14. Narrow berms and levees		
15. Streaming lineations		
16. Desiccation/mud cracks		
17. Armored mud balls		
18. Knick Points		

Table 2. Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West

	(D) Below OHW	(E) At OHW	(F) Above OHW
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian Indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

Table 3. Summary of Wetland Indicator Status

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability of 67–99%)
Facultative	FAC	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34-66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67–99%)
Obligate Upland	UPL	Almost always occur in non-wetlands (estimated probability >99%)
Non-Indicator	NI	No indicator status has been assigned

Source: Reed 1988

Table 4. Wetland Hydrology Indicators*

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	Local Soil Survey Data

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 5. Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface Water	X	
A2 – High Water Table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	X (Non-riverine)	X (Riverine)
B2 – Sediment Deposits	X (Non-riverine)	X (Riverine)
B3 – Drift Deposits	X (Non-riverine)	X (Riverine)
B6 – Surface Soil Cracks	X	
B7 – Inundation Visible on Aerial Imagery	X	
B9 – Water-Stained Leaves	X	
B10 – Drainage Patterns		X
B11 – Salt Crust	X	
B12 – Biotic Crust	X	
B13 – Aquatic Invertebrates	X	
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	X	
C2 – Dry-Season Water Table		X
C3 – Oxidized Rhizospheres along Living Roots	X	

	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)
C4 – Presence of Reduced Iron	X	
C6 – Recent Iron Reduction in Tilled Soils	X	
C7 – Thin Muck Surface	X	
C8 – Crayfish Burrows		X
C9 – Saturation Visible on Aerial Imagery		X
Group D – Evidence from other Site Conditions or Data		
D3 – Shallow Aquitard		X
D5 – FAC-Neutral Test		X

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 6. Field Indicators of Hydric Soil Conditions*

1. Indicators of Historical Hydric Soil Conditions	2. Indicators of Current Hydric Soil Conditions
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for *7 continuous days) c. Sulfidic material (rotten egg smell)

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 7. Hydric Soil Indicators for the Arid West*

Hydric Soil Indicators			Hydric Soil Indicators for Problem Soils**
All Soils	**Sandy Soils**	**Loamy and Clay Soils**	
A1 – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Verti
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	—	F7 – Depleted Dark Surface	Other (See Section 5 of Regional Supplement, Version 2.0)
A9 – 1 cm Muck	—	F8 – Redox Depressions	—
A11 – Depleted Below Dark Surface	—	F9 – Vernal Pools	—
A12 – Thick Dark Surface	—	—	—

*Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Ver. 2.0.
**Indicators of hydrophytic vegetation and wetland hydrology must be present.

Appendix D

Cultural Resources Assessment Report

CULTURAL RESOURCES ASSESSMENT REPORT

North San Bernardino Channel Project

Prepared for

San Bernardino County Flood Control District

Submitted by

Aspen environmental group

July 2026

NATIONAL ARCHAEOLOGICAL DATABASE INFORMATION

Authors: Hoke, Michael M.A., RPA
DeOliveira, Lauren, M.S., RPA
Hatheway, Roger, M.A.

Date: July 2026

Title: Cultural Resources Assessment for the North San Bernardino Channel Project San Bernardino County, California

Submitted by: Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

Submitted to: San Bernardino County Flood Control District and South Central Coastal Information Center

This document contains sensitive information regarding the location of archaeological sites, which should not be disclosed to the public or other unauthorized persons. Archaeological and other heritage resources can be damaged or destroyed through uncontrolled public disclosure of information regarding their location.

Therefore, information regarding the location, character, or ownership of archaeological or other heritage resources is exempt from the Freedom of Information Act pursuant to the National Historic Preservation Act (16 USC Section 340), the Archaeological Resources Protection Act (16 USC Section 9(a)), Executive Order 13007, and Section 6254.10 of the California State Government Code. This report and records that relate to archaeological site information are exempt from the California Public Records Act (Government Code Section 6250 et seq.). In addition, Government Code Section 6254.19(r) explicitly authorizes public agencies to withhold information from the public relating to Native American graves, cemeteries, sacred places, and records of Native American places, features, and objects maintained by the Native American Heritage Commission pursuant to Sections 5097.9 and 5097.993 of the Public Resources Code (PRC) and Section 296.18 of the Code of Federal Regulations.

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1. EXECUTIVE SUMMARY

San Bernardino County Flood Control District (District) is receiving federal funding for the propose of constructing the North San Bernardino Channel Project (Proposed Project or Project), which would include the construction of an 8-foot-high reinforced concrete rectangular ultimate channel to replace the existing channel and three street crossings/culverts, as well as the relocation of various utilities (primarily at the street crossings). The Proposed Project therefore must comply with Section 106 of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA) guidelines. The Area of Potential Effect (APE) was surveyed and researched with regards to potential impacts to archaeological and built environment cultural resources pursuant to appropriate federal and state guidelines.

A cultural resources records search was conducted by staff at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton, California, on July 6, 2026. Eight (8) previously prepared reports and two (2) previously recorded sites were identified by the Information Center within the 0.25-mile records search buffer. No resources were identified within the APE for the Project as a result of the record search.

The Native American Heritage Commission (NAHC) completed a search of its Sacred Lands File (SLF) to determine if resources significant to Native Americans have been recorded within 0.25-miles of the APE. On May 5, 2026, Aspen received a response from the NAHC stating that the results of the SLF was positive. The NAHC also suggested contacting specific tribes and provided an additional contact list of Native American tribal governments that might have information regarding cultural resources in the Project area. The County is responsible for any needed tribal outreach or formal consultation.

On July 13, 2026, Aspen staff conducted an archaeological and built environment survey of the APE. The archaeological survey did not identify any historic-aged or precontact archaeological resources. The built environment survey identified the Little Mountain Dam, components of which include the North San Bernardino Channel and Little Mountain Basin within the APE. Historical research has identified these components as 45+ year old. As a means of determining overall impacts and effects of the Proposed Project on any potential district of San Bernardino County Flood Control resources, a DPR 523 update was prepared for Little Mountain Dam that included the North San Bernardino Channel and Little Mountain Basin. The Little Mountain Dam and its components have been previously found ineligible for listing on the California Register of Historic Resources (CRHR) and National Register of Historic Places (NRHP). Aspen concurs with this recommendation.

In summary, based on the results of an intensive survey and research, Aspen recommends that the Little Mountain Dam, and associated channel and basin within the APE, are ineligible for listing to the NRHP and CRHR. Additionally, this resource does not qualify as a larger district given the fact that the great majority of facilities maintained by the District are ubiquitous and undistinguished in design, and all such facilities, in a manner similar to freeways and roads, cannot be regarded as part of a significant larger whole.

In the unlikely event that there is an inadvertent discovery of cultural resources or an inadvertent discovery of human remains during construction of the Project, Aspen has made standard recommendations in the event of these discoveries.

2. INTRODUCTION

2.1. Project Description

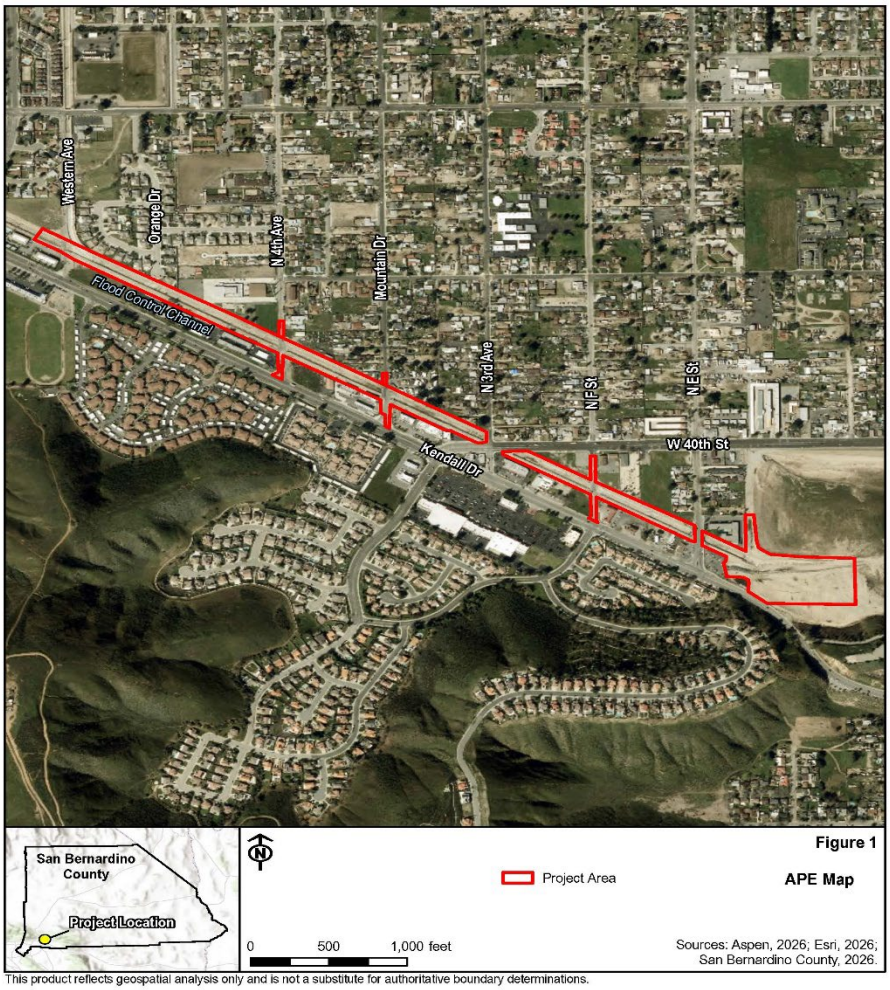
The District proposes to construct the North San Bernardino Channel Project, which would include the construction of an 8-foot-high reinforced concrete rectangular ultimate channel to replace the existing channel and three street crossings/culverts, as well as the relocation of various utilities (primarily at the street crossings). The existing rural and interim channel was constructed in the 1950s and intended to be a temporary flood control channel designed for 25-year event upstream and 10-year event downstream flood protection. The Proposed Project is funded with federal funds through the Hazard Mitigation Grant Program and National Environmental Policy Act (NEPA) compliance would be required through the Governor's Office of Emergency Services (CalOES). CalOES is the lead agency for NEPA compliance.

2.2. Project Location

The Project would be located within the North San Bernardino Channel (formerly known as Devil Creek Channel) north of Kendall Drive, from Western Avenue to Little Mountain Basin (approximately 1 mile), in the City of San Bernardino, San Bernardino County (see Figure 1). The Project site is surrounded by residential and institutional development to the north and west, Little Mountain Basin (an earthen flood control basin maintained by the District) to the east, and residential and commercial development to the south. The Project site is approximately 1 mile south of Interstate 215 (I-215). Staging areas are included within the Project site totaling 4.63 acres at the eastern end of the channel within Little Mountain Basin.

For cultural resources, the APE is synonymous with the Project site. The APE is inclusive of all ground disturbing activities, including staging areas.

Figure 1. Area of Potential Effects



3. REGULATORY FRAMEWORK

Numerous laws, ordinances, regulations, and standards on federal, state, and local levels seek to protect and manage cultural resources. The APE of the Project was surveyed and researched with regards to potential impacts on cultural resources in accordance with all appropriate federal and state guidelines

3.1. Federal

National Historic Preservation Act of 1966 as Amended (NHPA) (36 CFR 800). The NHPA sets forth the responsibilities that federal agencies must meet regarding cultural resources. Based on Section 106 and its implementing regulations in 36 CFR Part 800, federal agencies must conduct the necessary studies and consultations to identify cultural resources that may be affected by an undertaking, evaluate cultural resources that may be affected to determine if they are eligible for the NRHP (that is, whether identified resources constitute historic properties), and assess whether such historic properties would be adversely affected. Historic properties are resources that are listed in or eligible for listing in the NRHP (36 CFR

800.16[l][1]). A property may be listed in the NRHP if it meets criteria provided in the NRHP regulations (36 CFR 60.4). Typically, such properties must also be 50 years or older (36 CFR 60.4[d]).

Section 106 defines an adverse effect as an effect that alters, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]). Consideration must be given to the property's location, design, setting, materials, workmanship, feeling, and association, to the extent that these qualities contribute to the integrity and significance of the resource. Adverse effects may be direct and reasonably foreseeable or may be more remote in time or distance or be cumulative (36 CFR 8010.5[a][1]).

National Register of Historic Places (NRHP), 1966. The NRHP is "an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR Part 60.2). Eligibility for inclusion in the NRHP is determined by applying the following criteria, which were developed by the National Park Service in accordance with the NHPA as outlined in 36 CFR Part 60.4:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

A. *Are associated with events that have made a significant contribution to the broad patterns of our history; or,*
B. *Are associated with the lives of persons significant in our past; or,*
C. *Embody 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. *Have yielded, or may be likely to yield, information important in prehistory or history.*

Any prehistoric or historic period district, site, building, structure, or object that meets one or more of the criteria above and possesses sufficient integrity may be eligible for inclusion in the NRHP as a historic property. The NRHP defines integrity through the evaluation of seven aspects or qualities of a resource, including: feeling, association, workmanship, location, design, setting, and materials. The NRHP defines these as:

- Feeling: a property's expression of the aesthetic or historic sense of a particular period of time.
- Association: the direct link between an important historic event or person and a historic property.
- Workmanship: the physical evidence of the crafts of a particular culture, people, or individual during any given period in history or prehistory.
- Location: the place where the historic property was constructed or the place where the historic event occurred.
- Design: a combination of elements that create the form, plan, space, structure, and style of a property.
- Setting: the physical environment of a historic property.
- Materials: the physical construction elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

American Antiquities Act, "Antiquities Act," (16 USC 431-433). The Antiquities Act was signed into law in 1906 with the explicit goal of protecting the nation's cultural resources and is widely viewed as the cornerstone for subsequent regulatory protection of archaeological and historic architectural features and cultural materials. It prohibits and criminalizes the appropriation, excavation, injury and destruction of "any historic

or prehistoric ruin or monument, or any object of antiquity" on federally owned or managed lands without permission of the secretary of the federal department with jurisdiction; and establishes penalties for such acts, including fines and/or imprisonment.

Archaeological Resources Protection Act (ARPA) of 1979 (Public Law 96-95). The ARPA has been amended several times. This act is intended to protect archaeological sites and resources on public land and Tribal lands. The ARPA also codifies a federal definition of the term "archaeological resources," such that the term now includes all material remains of past human life or activities that are determined to be of archaeological interest and that are at least 100 years of age. The ARPA prohibits excavation or removal of archaeological resources on federal lands without first obtaining a federal permit. The act also establishes civil and criminal penalties for unauthorized excavation and removal of archaeological resources. Permits may only be issued to qualified individuals for the purposes of furthering archaeological knowledge in the public interest. All resources that are excavated or removed remain the property of the United States and once removed must be preserved by a suitable archival institution.

Native American Graves Protection and Repatriation Act (NAGPRA), enacted in 1990. NAGPRA conveys to American Indians of demonstrated lineal descent, the human remains and funerary or religious items that are held by federal agencies and federally supported museums, or that have been recovered from federal lands. It also makes the sale or purchase of American Indian remains illegal, whether they derive from federal or Indian lands.

National Environmental Policy Act (NEPA). NEPA requires federal agencies to assess the potential for their actions (including permitting and funding decisions) to result in significant impacts on the environment, including the "degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register for Historic Places or may cause loss or destruction of significant scientific, cultural or historic resources" (40 CFR 1508.24(b)(8)).

3.2. State

California Register of Historical Resources (PRC § 5024.1). The CRHR establishes the following criteria for listing as a historical resource:

1. is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
2. is associated with the lives of persons important to our past
3. embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
4. has yielded, or may be likely to yield, information important in prehistory or history

The CRHR also includes the following:

- properties determined eligible for or listed in the National Register of Historic Places
- a resource included in a local register of historical resources or identified in a historical resources survey
- any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant
- Points of Historical Interest and State Historical Landmarks with a number greater than No 770.

California Environmental Quality Act (PRC § 21084.1). CEQA requires that lead agencies determine if a project could have a significant impact on historical or unique archaeological resources. CEQA establishes that an impact that results in a substantial adverse change in the significance of a historical resource is considered a significant impact on the environment. A substantial adverse change could result from physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired (Cal. Code Regs., tit. 14, § 15064.5 (b)(1)). Material impairment is defined as demolition or alteration in an adverse manner [of] those characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR or a local register (Cal. Code Regs., tit. 14, § 15064.5(b)(2)(A)).

In 2014, CEQA was expanded to include the category tribal cultural resource. A project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (PRC § 21084.2). It further states the CEQA lead agency shall, when feasible, avoid damaging effects to any tribal cultural resource (PRC § 21084.3).

Unique Archaeological Resources (PRC § 21083.2). If an archaeological resource does not qualify as a historical resource, it may meet the definition of a "unique archaeological resource." The PRC Section 21083.2(g) defines a unique archaeological resource as an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. has a special and particular quality such as being the oldest of its type or the best available example of its type
3. is directly associated with a scientifically recognized important prehistoric or historic event or person

Health and Safety Code, Section 7050.5. In the event of the discovery of human remains outside of the context of a formal cemetery, the California Health and Safety Code, Section 7050.5 requires that construction be halted and that the coroner be notified. It also requires the coroner to notify the NAHC if remains are determined to be Native American in origin.

Public Resources Code, Section 5097.98. In the event human remains are discovered, PRC Section 5097.98 authorizes the NAHC to assign a Most Likely Descendant (MLD). Requires that the landowner ensure the discovery is not further damaged and the MLD then may, with the landowner's permission, inspect the find and make recommendations for the culturally appropriate treatment or disposition of the human remains and any associated grave goods. The landowner shall confer with the MLD all reasonable options regarding the MLD's preferences for treatment. Where the parties are unable to agree on the appropriate treatment measures, the Native American human remains and associated items shall be reinterred on the property with appropriate dignity.

3.3. Local

San Bernardino County Policy Plan

The Cultural Resources Element of the San Bernardino County Policy Plan contains the following applicable goals and policies:

- Policy CR-1.1—Tribal Notification and Coordination: Requires the County to notify and coordinate with tribal representatives in accordance with applicable state and federal laws. Coordination

must address avoidance of Native American archaeological sites and burials, treatment of inadvertent discoveries, and consideration of avoidance alternatives early in project planning.

- Policy CR-1.2—Tribal Planning: Requires the County to collaborate with local tribes during countywide planning efforts and, when permitted or required, during planning efforts initiated by tribes.
- Policy CR-1.3—Mitigation and Avoidance: Requires consultation with local tribes to develop project-specific mitigation measures and resource-specific treatment procedures. Applicants must design projects to avoid known tribal cultural resources whenever possible. When avoidance is infeasible, appropriate mitigation must be implemented to minimize impacts.
- Policy CR-1.4—Resource Monitoring: Encourages coordination with and active participation by local tribes as monitors during cultural resources surveys, testing, excavation, grading, and other project activities that could affect tribal resources.
- Policy CR-2.1—National and State Historic Resources: Encourages preservation of archaeological sites and structures of state or national significance in accordance with the Secretary of the Interior's Standards.
- Policy CR-2.2—Local Historic Resources: Encourages property owners to maintain the historic integrity of locally significant resources. Treatment should follow the County's stated order of preference: preservation, adaptive reuse, and memorialization.
- Policy CR-2.3—Paleontological and Archaeological Resources: Requires new development to avoid archaeological and paleontological resources whenever possible. When avoidance is infeasible, appropriate mitigation must be implemented to salvage and preserve affected resources and maintain their quality and integrity.
- Policy CR-2.4—Partnerships: Encourages partnerships that support and fund the preservation and restoration of historic sites, structures, and districts.
- Policy CR-2.5—Public Awareness and Education: Directs the County to increase public awareness and provide education concerning historic, natural, tribal, and cultural resources through the San Bernardino County Museum and collaboration with other organizations (San Bernardino County, 2025).

San Bernardino County Development Code

Chapter 82.12 of the San Bernardino County Development Code establishes the Cultural Resources Preservation (CP) Overlay and contains the following requirements:

Section 82.12.010—Purpose: Establishes the CP Overlay to identify and preserve important archaeological and historical resources because these resources are unique and nonrenewable and contribute to an understanding of county history**.**

Section 82.12.020—Location Requirements: Allows the CP Overlay to be applied where archaeological or historic resources warranting preservation are known or likely to occur. Known resources may be identified through the California Archaeological Inventory, California Historical Resources Inventory, California Historical Landmarks, California Points of Historical Interest, or National Register of Historic Places.

Section 82.12.030—Application Requirements: Requires applications for projects within a CP Overlay to include a cultural resources report prepared by a qualified professional. The report must determine whether archaeological or historical resources are present and recommend appropriate protection or data-recovery measures. Required measures may include:

- Site recordation;
- Mapping and surface collection;
- Artifact analysis and curation;
- Excavation of subsurface deposits;
- Preservation through an open-space easement;
- Dedication to an appropriate institution; or
- Curation of recovered materials and documentation at the San Bernardino County Museum.

Section 82.12.040—Development Standards: Requires the proposed project to incorporate all protection and data-recovery measures recommended in the qualified professional's report. Resources determined to be extremely important should, when possible, be preserved as open space or dedicated to a public institution.

Section 82.12.050—Native American Monitor: Requires notification of the appropriate local tribe when Native American cultural resources are discovered during grading or excavation or when a project site is within a high-sensitivity CP Overlay area. If requested by the tribe, a Native American monitor must be present during grading or excavation to ensure that cultural materials are appropriately protected or recovered (San Bernardino County, 2026a).

City of San Bernardino General Plan

The City of San Bernardino General Plan establishes the local policy framework for identifying, evaluating, preserving, and managing cultural resources within the City. Chapter 11, Historical and Archaeological Resources, recognizes that archaeological sites, historic buildings, structures, districts, and other culturally significant properties are nonrenewable community resources that may be affected by development.

Goal 11.1 directs the City to develop a program to protect, preserve, and restore sites, buildings, and districts possessing architectural, historical, archaeological, or cultural significance. Policy 11.1.2 calls for the City to maintain and update its Historic Resources Reconnaissance Survey database and integrate the resulting information into the City's ordinance and environmental-review processes. Policy 11.1.4 similarly directs the City to maintain an inventory of significant historic, architectural, and cultural resources. Both policies recognize the need to consult California Native American tribes before publicly distributing information that may raise confidentiality concerns (City of San Bernardino, 2005).

Policy 11.1.9 requires environmental review of grading, building, demolition, and other applications involving resources that are designated or potentially eligible for designation as significant. This review is intended to ensure that significant resources are identified, preserved, and protected before project approval or ground disturbance occurs (City of San Bernardino, 2005).

Goal 11.4 directs the City to protect and enhance its historic and cultural resources. Policy 11.4.1 encourages the preservation, maintenance, enhancement, and adaptive reuse of existing buildings within redevelopment and commercial areas. The policy also supports retaining and renovating existing residential buildings or relocating such buildings when onsite preservation is determined infeasible (City of San Bernardino, 2005).

Goal 11.5 addresses archaeological resources specifically. Policy 11.5.1 calls for an inventory of archaeologically sensitive areas, with tribal consultation conducted before sensitive information is publicly distributed. Policy 11.5.2 directs the City to develop mitigation measures for projects within archaeologically sensitive areas. Such measures may include protecting archaeological locations, recovering cultural materials when appropriate, and consulting California Native American tribes

regarding the treatment and disposition of Native American cultural materials (City of San Bernardino, 2005).

4. ENVIRONMENTAL SETTING

San Bernardino is located within the upper Santa Ana River watershed, which encompasses approximately 2,650 square miles across portions of San Bernardino, Riverside, Orange, and Los Angeles counties. The Santa Ana River originates in the San Bernardino Mountains and flows generally west and southwest through the San Bernardino Valley toward the Pacific Ocean. The valley occupies a structural basin bounded by the San Gabriel Mountains to the northwest, the San Bernardino Mountains to the north and northeast, and the Crafton Hills, Box Springs Mountains, and other uplands to the south and southeast. The valley floor consists primarily of broad, coalescing alluvial fans formed by sediment transported from the surrounding mountains by the Santa Ana River and tributary drainages, including Cajon Creek, Lytle Creek, Devil Canyon Creek, East Twin Creek, City Creek, and Mill Creek (Dutcher and Garrett, 1963; SAWPA, 2013).

Surficial geology in the San Bernardino area generally consists of Quaternary alluvial-fan, alluvial-valley, and active-channel deposits underlain by older basin-fill sediments and crystalline basement rock. These deposits commonly consist of unconsolidated to moderately consolidated gravel, sand, silt, and clay derived from granitic, metamorphic, and sedimentary rocks in the adjacent mountain ranges. The age and composition of the deposits vary according to their position within the basin and proximity to active or former drainages. Younger Holocene alluvium and wash deposits typically occur along active channels and recently formed floodplains, while Pleistocene and older alluvial deposits commonly underlie elevated fan surfaces and older portions of the valley floor (Dutcher and Garrett, 1963; Morton and Miller, 2003.

San Bernardino has a hot-summer Mediterranean climate characterized by hot, dry summers and mild, comparatively wet winters. Most precipitation occurs between approximately November and March, while summer rainfall is limited and generally associated with isolated monsoonal thunderstorms. Late summer and autumn may also bring hot, dry Santa Ana winds from the interior deserts, which can substantially reduce humidity and increase wildfire conditions. Current climatic characterization should rely on the National Oceanic and Atmospheric Administration's 1991–2020 climate normals for the nearest representative weather station (NOAA, 2021). Natural vegetation in undeveloped portions of the San Bernardino Valley may include Riversidean sage scrub, alluvial-fan sage scrub, chaparral, annual grassland, and riparian communities, depending on elevation, soils, drainage conditions, and the extent of prior disturbance (San Bernardino County, 2020).

5. HISTORIC CONTEXT

5.1. Precontact Background

The chronological framework applied to the San Bernardino Valley in this analysis is based on Wallace's (1955) four-part horizon sequence for southern California, as subsequently revised by Warren (1968). The strengths and limitations of southern California chronological frameworks have been examined by Warren (Moratto, 1984), Chartkoff and Chartkoff (1984), and Heizer (1978). The following discussion primarily follows the cultural sequence presented by Warren (1968), as refined and summarized by Byrd and Raab (2007).

5.1.1. Paleoindian Period (13,000 to 10,000 cal. BCE)

Evidence for Paleoindian occupation in inland southern California remains limited, and interpretations of this period generally draw from the broader archaeological record of North America. Earlier models proposed that the first inhabitants of the Americas migrated from northeastern Asia across Beringia and traveled south after continental ice sheets began to recede near the end of the Pleistocene. More recent discoveries have complicated this model and support the possibility of multiple migration routes, including movement along the Pacific Coast. The timing, routes, and circumstances of the initial peopling of the Americas remain subjects of continuing archaeological debate.

Among the earliest human remains identified in North America are those from Arlington Springs on Santa Rosa Island, dated to approximately 13,000 years before present (Johnson et al., 2002). Other early sites include Monte Verde in Chile (Meltzer et al., 1997) and Meadowcroft Rockshelter in Pennsylvania, although the age and interpretation of some early deposits remain debated. Paleoindian groups are generally characterized as highly mobile hunter-gatherers who relied on diverse animal and plant resources. Their material culture included distinctive flaked-stone technologies, including projectile points and other tools distributed across broad portions of North America. Although plant foods were likely an important part of the diet, tools specifically associated with intensive plant processing are comparatively uncommon in identified Paleoindian assemblages.

Near the end of the Pleistocene, approximately 10,000 years ago, climatic warming and associated environmental changes coincided with the extinction of many large-bodied animal species. Human communities responded by broadening their subsistence practices to include a more diverse range of plant foods and smaller game. Technological traditions became increasingly regionalized and included a greater variety of tools used for processing plant and animal resources. This suite of economic, technological, and settlement changes is commonly associated with the Archaic period, a broadly defined hunter-gatherer adaptation that persisted in varied forms throughout much of North America.

5.1.2. Early Archaic Period (10,000 to 8,000 cal. BCE)

The earliest Archaic-period adaptation recognized in inland southern California is commonly associated with the San Dieguito tradition, named for the San Diego region where it was initially identified and studied (Warren, 1968). Characteristic artifacts include stemmed projectile points, crescents, and leaf-shaped bifacial tools. These assemblages suggest that hunting remained an important subsistence activity, although the large Pleistocene megafauna associated with the preceding Paleoindian period were no longer present.

Milling implements appeared in the regional archaeological record by approximately 7,500 years before present (Moratto, 1984). Assemblages containing basin milling stones, minimally shaped manos, projectile points, cogged stones, and flexed burials beneath stone cairns are generally associated with the La Jolla Complex, which dates from approximately 7,500 to 3,000 years before present. The transition from San Dieguito to La Jolla adaptations may have been related, in part, to increasingly arid conditions after approximately 8,000 years before present. These environmental changes may have encouraged population movements and the spread of milling technology from inland desert areas toward the coast. Coastal populations increasingly relied on marine resources, particularly shellfish, while inland communities emphasized the collection and processing of wild seeds, acorns, and other plant foods.

5.1.3. Archaic Period (8,000 to 3,000 cal. BCE)

Milling stone adaptations emerged in central and southern California approximately 8,000 to 7,000 years before present. Subsistence practices emphasized the gathering and processing of seeds and other plant foods, supplemented by hunting a variety of small- and medium-sized animals. Typical artifact

assemblages include manos, milling stones or metates, and large core-and-cobble chopping tools. Other artifacts may include hammerstones, scraper planes, scrapers and other large flake tools, worked bone, beads, cogged stones, discoidal, perforated stones, and stone balls. Projectile points, generally represented by large leaf-shaped and Elko forms, occur less frequently; however, faunal remains demonstrate that deer, rabbits, and other animals were hunted. Sites near bays and estuaries also frequently contain substantial quantities of shellfish and fish remains, reflecting an increased reliance on coastal resources (Byrd and Raab, 2007).

5.1.4. Intermediate Period (3,000 to 1350 cal. BCE)

The Intermediate Period is marked by the introduction of mortars and pestles for processing acorns, seeds, greens, and other plant foods. Large projectile points, including Elko forms, suggest that hunting was conducted primarily with darts propelled by atlatls. Settlement patterns may have been semi-sedentary, with winter residential bases established near reliable water sources and temporary camps used seasonally to procure and process resources throughout the surrounding landscape.

5.1.5. Late Precontact Period (1,350 cal. BCE to Historic)

The Late Prehistoric Period is marked by the introduction of the bow and arrow, which increased hunting efficiency, and the adoption of ceramic technology after approximately A.D. 1000. Some researchers have proposed that population movements during this period contributed to changes in social practices, including the replacement of inhumation with cremation in some areas, and helped shape the linguistic and cultural patterns documented at the time of European contact (Byrd and Raab, 2007). Acorns were an important food for inland populations and were gathered from oak groves along canyons, drainages, and foothills. Their preparation required intensive processing, including grinding with mortars and pestles and leaching with water to remove tannins.

The Medieval Climatic Anomaly, approximately 1,050 to 600 years before present, was a period of generally warmer and drier conditions that occurred during the Late Prehistoric Period. These conditions may have encouraged more intensive resource use and the establishment of permanent or semi-permanent settlements near reliable water sources in inland areas, including the San Bernardino Valley. In San Diego County, Meighan (1954) designated the period following approximately A.D. 1400 as the San Luis Rey Complex. San Luis Rey I, dating from approximately A.D. 1400 to 1750, is associated with bedrock mortars, milling stones, cremations, small triangular projectile points with concave bases, and Olivella shell beads. San Luis Rey II, dating from approximately A.D. 1750 to 1850, is distinguished by the addition of pottery, red and black pictographs, cremation urns, steatite arrow straighteners, and Euro-American materials (Meighan, 1954; Keller and McCarthy, 1989). Research at Cole Canyon and other southern California sites indicates that many elements of this cultural complex, as well as practices documented ethnographically among the region's Native American communities, were established by at least 1,000 years before present (Keller and McCarthy, 1989).

5.2. Ethnography

The APE is located in San Bernardino County near the southwestern extent of traditionally documented Serrano territory and the eastern extent of Tongva (Gabrieliño) territory. Ethnographic sources indicate that the traditional lands of these groups adjoined and may have overlapped in this region (Bean and Smith, 1978; Kroeber, 1925).

In southern California, Spanish mission names were commonly applied to the Native communities associated with each mission. The term "Gabrieliño," therefore, refers to Indigenous people associated with Mission San Gabriel, although many contemporary descendants identify as Tongva. During the ethnohistoric period, Tongva territory encompassed portions of present-day Los Angeles, Orange, and San

Bernardino counties and extended into northwestern Riverside County (Bean and Smith, 1978; Kroeber, 1925). The term "Serrano," derived from the Spanish word for "mountaineer" or "highlander," was applied to Native communities associated with the mountainous interior. Bean and Smith (1978) noted that Serrano territorial boundaries cannot be precisely defined because of limited historical information and the nature of their sociopolitical organization. Nevertheless, researchers generally associate Serrano territory with the San Bernardino Mountains east of Cajon Pass, the northern mountain foothills and adjacent desert near Victorville, areas extending east toward Twentynine Palms, and lands southward into Yucaipa Valley.

The Tongva and Serrano practiced hunting and gathering economies and maintained broadly similar semi-sedentary settlement patterns. Permanent villages were generally established near reliable water sources and may be archaeologically represented by midden deposits, bedrock milling features, and other evidence of sustained occupation. Village populations used a wide range of locally available resources and periodically established temporary camps to gather seasonally available plants and conduct communal hunts for deer, rabbits, and other animals. Communities were generally organized around clans, lineages, or other kinship-based groups.

Unlike the inland territory associated with the Serrano, Tongva territory extended to the Pacific Coast and included offshore islands. This provided Tongva communities with access to marine and estuarine resources, including shellfish, fish, marine mammals, and waterfowl (Hudson 1971). During seasonal resource-gathering activities, smaller groups traveled from established villages to temporary camps to obtain particular plant and animal resources. These activities sometimes left archaeological evidence such as bedrock mortars, grinding slicks, lithic artifacts, and temporary habitation deposits.

5.2.1. Tongva (Gabrieliño)

Ethnographic accounts indicate that Tongva ancestral territory encompassed much of the Los Angeles Basin, portions of Orange County, the southern Channel Islands, and areas extending east into the western San Bernardino Valley (Kroeber 1925). This territory included productive coastal, island, and lowland environments containing diverse terrestrial and marine resources. The name "Gabrieliño" was applied by the Spanish to Native people associated with Mission San Gabriel Arcángel, founded in 1771. Many contemporary descendants identify as Tongva, a name associated with the former village of Tovaangar in the San Gabriel area, while others use the name Kizh. Because contemporary descendant communities use different names, Tongva, Gabrieliño, and Kizh may appear in historical and modern sources (McCawley, 1996). Before European contact, the Tongva were among the most populous and socially complex Indigenous groups in southern California (Bean and Smith, 1978; Kroeber 1925; McCawley, 1996; Moratto, 1984).

The Tongva language belongs to the Cupan group of the Takic branch of the Uto-Aztecan language family. Tongva-speaking communities occupied an extensive area that included the Los Angeles Basin and portions of present-day San Bernardino and Orange counties, as well as Santa Catalina, San Clemente, and other southern Channel Islands (Kroeber 1925). Regional dialects included forms historically identified as Gabrieliño in the Los Angeles Basin and Fernandeño in the San Fernando Valley, along with dialects associated with island communities (Bean and Smith, 1978). Archaeological and linguistic evidence has been used to propose that Takic-speaking populations entered coastal southern California from the southern San Joaquin Valley or adjacent interior regions approximately 3,500 years ago, although the timing and nature of this movement remain subjects of archaeological discussion (Sutton, 2009).

Tongva communities followed a semi-sedentary settlement pattern centered on permanent villages near reliable inland water sources, coastal estuaries, and other productive resource areas. Houses generally consisted of circular frameworks of wooden poles covered with tule mats or thatching made from tule, carrizo, grasses, or ferns (McCawley, 1996). Other community structures included earth-covered

sweathouses heated by fire and open-air ceremonial enclosures known as yovaar, which were constructed from wooden posts and woven brush or willow (Kroeber, 1925).

Tongva subsistence practices incorporated a broad range of seasonally available terrestrial and marine resources. Plant foods included acorns, seeds, buckwheat, berries, fruits, roots, and greens, while deer, rabbits, birds, and other animals were hunted individually or communally. Smaller groups periodically occupied temporary camps to gather and process resources away from permanent villages. Coastal and estuarine camps provided access to shellfish, fish, marine mammals, and waterfowl (Hudson, 1971).

Tongva maintained extensive maritime and trading networks. Plank canoes, commonly known as ti'aat, enabled travel between the mainland and offshore islands, particularly Santa Catalina and San Clemente islands. These vessels were constructed from fitted wooden planks sewn or lashed together and sealed with asphaltum. Marine and island resources included fish, sea otter pelts, sea lions, harbor seals, seabirds, shellfish, shell beads, and steatite. Many of these materials, particularly shell beads and steatite objects, circulated through exchange networks connecting coastal and island communities with inland populations (Bean and Smith 1978; Kroeber 1925). Tongva material culture also included curved throwing sticks used for rabbit hunting, known as makana, as well as turtle-shell rattles, wooden clapper sticks, cane knives, baskets, stone tools, and ceremonial objects (Kroeber, 1925).

Tongva society was organized around kinship groups residing in politically and economically independent villages. Communities generally included extended families connected through patrilineal relationships, although marriage typically occurred outside the immediate lineage or village. Each village was led by a chief whose position was commonly inherited through the male line. Shamans directed religious and healing practices, while appointed individuals supervised communal hunting, fishing, and other specialized activities (Bean and Smith, 1978; Heizer, 1968). Mortuary practices included both cremation and inhumation, with inhumation reportedly more common among some offshore island communities (Bean and Smith 1978; Kroeber 1925, as cited in Sutton, 2009).

Spanish colonization profoundly disrupted Tongva communities beginning in the late eighteenth century. By approximately 1800, many Tongva had been forcibly incorporated into the mission system, while others moved to neighboring Indigenous communities or more distant areas. Introduced diseases, violence, forced labor, displacement, and poor conditions at the missions resulted in substantial population loss and the disruption of traditional settlement, subsistence, and social systems. Native people from surrounding Serrano, Luiseño, Cahuilla, and other communities were also relocated to the missions, creating new multiethnic communities as Indigenous populations declined and reorganized under colonial rule (Bean and Smith, 1978; Dice, 2011).

5.2.2. Serrano

The Serrano are a Takic-speaking people whose language belongs to the Uto-Aztecan language family. Archaeological and linguistic models have proposed that their ancestors entered southern California from the Great Basin approximately 1,500 years ago, although the timing and character of this movement remain subjects of scholarly discussion (Kroeber, 1925). Traditionally documented Serrano territory extended from Mount San Antonio in the San Gabriel Mountains eastward to San Gorgonio Mountain in the San Bernardino Mountains, north into portions of the Mojave Desert, and south to the margins of the San Bernardino Valley. Many Serrano settlements were located within the foothills and forest-transition zones of the San Bernardino Mountains, although communities also occupied parts of the San Bernardino Valley and Mojave Desert. Access to dependable water was a principal factor influencing the location, distribution, and permanence of settlements.

The Serrano language belongs to the Serran division of the Takic branch of the Uto-Aztecan language family. Languages and dialects assigned to this division include Serrano, Kitanemuk, Vanyume, and Tataviam (Mithun, 2006; Sutton, 2009). The Kitanemuk, whose traditional territory lay northwest of the

Serrano, spoke a closely related Serran language. The name "Serrano," derived from the Spanish term for "mountaineer" or "highlander," was applied to Native communities associated with the San Bernardino Mountains (Kroeber, 1925). The Vanyume occupied settlements along the Mojave River and in adjoining portions of the Mojave Desert. Historical sources sometimes referred to them as "Desert Serrano," and their language is generally interpreted as a Serrano dialect or a closely related Serran language (Mithun, 2006). The Vanyume also maintained cultural and economic relationships with other Indigenous communities throughout the Mojave Desert.

Serrano subsistence practices incorporated a broad range of seasonally available plant and animal resources. Important plant foods included acorns, grass seeds, bulbs, tubers, berries, piñon nuts, yucca, mesquite beans, cactus fruits, and chia seeds. Animals hunted included deer, bighorn sheep, pronghorn, rabbits, rodents, and birds such as quail. Because reliable water was essential for drinking, food preparation, and resource availability, permanent villages were generally established near springs, streams, or other dependable water sources (Bean and Smith, 1978).

Hunting equipment included bows and arrows, traps, snares, nets, and curved throwing sticks. Food-processing and cooking implements included manos and metates, mortars and pestles, ceramic vessels, baskets, horn and bone spoons, earth ovens, and heated stones. Other tools and personal items included fire drills, stone pipes, awls, arrow straighteners, yucca-fiber clothing, and carrying bags. Musical and ceremonial instruments included rasps, rattles, whistles, and bull-roarers (Bean et al. 1981; Bean and Smith, 1978; Bean and Vane, 2002).

Traditional houses were generally circular, domed structures constructed from willow frames and covered with tule or other thatching. A central hearth provided heat and served domestic functions. Ramadas were typically rectangular shade structures consisting of wooden posts, crossbeams, and thatched roofs. Other community structures included granaries, semi-subterranean sweathouses, and ceremonial houses known as kika. The kika served as a center for religious activities and, in some cases, as the residence of ceremonial or lineage leaders. Sweathouses were commonly constructed near streams, pools, or other water sources.

Seasonal changes strongly influenced Serrano subsistence and settlement activities. During winter, communities relied heavily on stored acorns, mesquite beans, and piñon nuts, supplemented by available greens and game. Spring provided cacti, agave, fresh greens, and animal resources, while seeds and fruits became increasingly available during summer. Acorns, mesquite beans, and piñon nuts were gathered and stored during the fall, when communal rabbit drives and other group hunting activities were also conducted (Bean et al., 1981; Bean and Smith, 1978; Bean and Vane, 2002).

Serrano society was organized primarily through patrilineal kinship groups. Individuals were affiliated with one of two exogamous moieties: Tukum, associated with the wildcat, or Wahilyam, associated with the coyote. These moieties structured marriage relationships, as individuals were generally required to marry outside their own moiety. Serrano communities consisted of locally organized clans or village groups connected through kinship, marriage, ceremonial obligations, and exchange relationships (Kroeber, 1925). Mortuary practices included both cremation and inhumation, although practices varied according to community, time period, and local tradition (Bean and Smith, 1978; Strong, 1929, as cited in Sutton, 2009).

Sustained colonial intrusion into Serrano territory increased during the early nineteenth century. In 1819, Spanish missionaries established the San Bernardino asistencia near present-day Redlands as an outpost of Mission San Gabriel. The mission system contributed to the forced relocation, labor, religious conversion, and displacement of many Serrano people. Other Serrano communities remained in the mountains and areas northeast of San Gorgonio Pass, where they retained and continued important elements of their cultural traditions. Serrano descendants continue to maintain their cultural identities,

governments, and connections to ancestral lands. Contemporary Serrano communities include the San Manuel Band of Mission Indians and Serrano descendants associated with the Morongo Band of Mission Indians (Archer, 2018; Bean and Smith, 1978; Blumel et al., 2015; Yorck and Freedman, 2017).

5.3. Historic Background

5.3.1. Spanish Period (1542 to 1821)

The first documented European exploration of the Alta California coast occurred in 1542, when Spanish navigator Juan Rodríguez Cabrillo sailed north under the authority of the viceroy of New Spain. Cabrillo and his crew visited San Diego Bay, Santa Catalina Island, San Pedro Bay, and the northern Channel Islands while searching for a navigable route through or around North America. In 1579, English privateer Francis Drake landed along the northern California coast, possibly at present-day Drake's Bay or Bodega Bay, where his expedition encountered Coast Miwok people. Sebastián Vizcaíno conducted another Spanish coastal expedition in 1602, traveling as far north as Monterey and identifying the bay as a favorable location for a harbor (Castillo, 1978). Vizcaíno also applied the name San Diego to the bay, which began appearing on European maps by 1624 (Gudde, 1998).

Spanish colonization of Alta California began in 1769 with an overland expedition led by Captain Gaspar de Portolá. Portolá and Franciscan missionary Junípero Serra traveled north from San Diego toward Monterey to identify locations for missions, military presidios, and civilian settlements. Between 1769 and 1823, the Franciscans established 21 missions throughout Alta California. These institutions were intended to extend Spanish colonial authority and convert Indigenous populations to Catholicism, while presidios and pueblos provided military and civilian support.

Mission San Diego de Alcalá was founded in 1769 within the traditional territory of the Kumeyaay, who were historically referred to by the Spanish as Diegueño. Mission San Gabriel Arcángel was founded in 1771 within Tongva territory east of present-day Los Angeles, while Mission San Fernando Rey de España was established in 1797 in the San Fernando Valley. Mission San Juan Capistrano was founded along San Juan Creek in 1776 within the traditional territory of the Acjachemen, historically called Juaneño. Mission San Luis Rey de Francia was established along the San Luis Rey River in 1798 within Luiseño territory. The vicinity of the Project area fell primarily within the colonial sphere of Mission San Gabriel. Farther west, missions were established within Chumash territory at San Buenaventura in 1782 and Santa Barbara in 1786 (Castillo, 1978).

Spanish exploration of the southern California interior increased during the 1770s. In August 1771, Captain Pedro Fages and a small group of soldiers departed the San Diego Presidio in search of military deserters. After abandoning the search near present-day Julian, the party continued north on an exploratory journey toward Cajon Pass and the Mojave Desert. During this expedition, Fages crossed the Santa Ana River east of the Project area, becoming one of the earliest documented Europeans to travel through the inland region (Harshman, 1992; Hudson, 1978; Lerch et al., 2006).

Several missions established inland outposts known as asistencias or estancias. In 1819, Mission San Gabriel established the San Bernardino mission outpost near present-day Redlands in the southern portion of Serrano territory (Bean and Smith, 1978b). Mission San Luis Rey established the San Antonio de Pala asistencia in Luiseño territory along the upper San Luis Rey River in 1810 (Pourade, 1961). Mission economies depended heavily on agriculture and livestock ranching, particularly the production of cattle hides and tallow for maritime trade. Mission San Luis Rey maintained large ranching operations in the Temecula and San Jacinto valleys (Gunther, 1984). The Spanish colonial system also included military presidios at San Diego and Santa Barbara and the civilian pueblo of Los Angeles.

5.3.2. Mexican Period (1821 to 1848)

The Mexican Period began in 1821, when Mexico achieved independence from Spain and Alta California became a Mexican province. During the 1830s, the Mexican government secularized the missions and redistributed large portions of former mission lands through private land grants. These grants, known as ranchos, were awarded primarily to Mexican citizens and former military personnel and were generally used for livestock ranching and agriculture (Robinson, 1948).

Rancho owners sometimes resided in established communities such as San Diego, San Juan Capistrano, or Los Angeles, while others constructed adobe residences on their properties. The rancho system transformed much of coastal and inland southern California into large private cattle ranches. Although secularization was officially intended to distribute mission lands in part to Indigenous residents, most property passed into the hands of politically connected private landowners, further displacing Native communities from their ancestral lands.

The Mexican Period ended following the Mexican-American War and the signing of the Treaty of Guadalupe Hidalgo in 1848. Under the treaty, Alta California was transferred to the United States and initially administered as the Territory of California.

5.3.3. American Period (1848 to the Present)

The discovery of gold in 1848 and the subsequent Gold Rush brought a rapid influx of settlers into California, contributing to its admission to the Union in 1850. Although many Mexican land grants were eventually recognized by United States courts, claimants were required to undergo lengthy and costly confirmation proceedings. Confirmed properties were surveyed by the U.S. Surveyor General, and their final boundaries were frequently more restricted than those described in the original grants.

Floods and droughts during the 1860s caused substantial livestock losses and weakened the rancho economy. At the same time, landowners faced new property taxes and mounting legal and surveying expenses. Many Californio ranchers borrowed money at high interest rates from newly arrived Anglo-American lenders. Foreclosures, court costs, and land sales consequently transferred much of the former rancho land to Anglo-American ownership (Cleland, 1941).

5.3.4. City of San Bernardino

The City of San Bernardino occupies a portion of Rancho San Bernardino, a Mexican-era land grant awarded in 1842 to José del Carmen Lugo, his brothers José María and Vicente Lugo, and their brother-in-law Diego Sepúlveda (Aviña, 1976). In 1851, the Lugo family sold part of the rancho to approximately 500 Mormon settlers from Salt Lake City, who established the community of San Bernardino. Most of these settlers returned to Utah approximately five years later (California Genealogy, 2008). San Bernardino County was created from a portion of Los Angeles County in 1853, with San Bernardino designated as the county seat (Gudde, 1969:280). The community was incorporated as a town in 1868 (California Genealogy, 2008).

San Bernardino remained a relatively small agricultural community until railroad construction stimulated substantial growth during the late nineteenth century. The Southern Pacific Railroad extended its line eastward from Los Angeles to Colton in 1875 but bypassed San Bernardino after the community declined to provide the requested subsidy (Dumke, 1944; Mullaly and Petty, 2002). The railroad subsequently reached Yuma in 1877 and established a transcontinental connection in western Texas in 1881 (Robertson, 1998).

More substantial development followed the arrival of the California Southern Railroad, a subsidiary of the Atchison, Topeka and Santa Fe Railway (AT&SF). Constructed northward from National City and San Diego, the railroad reached Colton in 1882 and San Bernardino in 1883. Its extension to Barstow was completed

in 1885, connecting San Bernardino with the AT&SF transcontinental system (Bryant, 1974). The AT&SF completed a direct route between San Bernardino and Los Angeles in 1887. Competition between the AT&SF and Southern Pacific produced a fare war that temporarily reduced transcontinental passenger fares to $1.00 in March 1887, encouraging substantial migration to southern California (Bryant, 1974). The resulting real estate boom led to the subdivision of numerous new tracts and additions, while assessed property values in San Bernardino doubled between 1885 and 1887 (Dumke, 1944). San Bernardino was incorporated as a city in 1886 (California Genealogy, 2008).

Like many southern California communities, San Bernardino experienced economic decline during the Great Depression. The local economy subsequently expanded during World War II as the region became an important center for military logistics and defense activities. San Bernardino's inland location and its connections to regional highway, railroad, and telephone networks made it suitable for military operations and contributed to its selection as a headquarters for the Western Defense Command. The U.S. Army established the San Bernardino Engineer Depot, commonly known as Camp Ono, near Shandin Hills northwest of the city. The San Bernardino Army Air Depot, later renamed Norton Air Force Base, was developed along the north side of the Santa Ana River between San Bernardino and Redlands (Belden, 1963). Norton Air Force Base remained an important component of the regional economy after World War II and continued operating until its closure in 1994.

6. BACKGROUND RESEARCH: METHODS AND RESULTS

6.1. Methods

A cultural resources records search was conducted by staff at the SCCIC at California State University, Fullerton, California, on July 6, 2026, and included a search of the APE and a surrounding 0.25-mile buffer area. All applicable historic topographic maps, photographs, and determinations of eligibility were also consulted.

6.2. Results

The record search results indicated that eight (8) previously prepared reports fell within the record search buffer, with one (1) covering a portion of the APE. The recorded studies are identified in Table 1 below.

Table 1. Previous Cultural Resource Studies Conducted within 0.25 miles of the APE

Report #	Authors	Year	Report Title	APE
SB-01355	Lerch, Michael	1983	Archaeological Survey Report for the Proposed Kendall Drive Street Improvement Project, City of San Bernardino, California	No
SB-01821	Peak & Associates, INC	1988	Cultural Resource Survey and Clearance for an AT&T Fiberoptic Communication Cable Re-Route from San Bernardino Northwest to San Bernardino Nation Forest Boundary	No
SB-02437	Jertberg, Patricia	1991	Cultural Resource Assessment of Tentative Tract 14735/ 34.1 Acres City of San Bernardino, San Bernardino County, California	No
SB-06291	Smith, F; Harper, C; Makeda, L; Dietler, J; Chasteen, C	2008	Cultural Resource Technical Report: sbX E Street Corridor BRT Project, Cities of San Bernardino and Loma Linda, San Bernardino County, California	No

SB-06291B	Chasteen, Carrie	2008	Determination of Effects Report sbX E Street Corridor Bus Rapid Transit (BRT) Project, Cities of Loma Linda and San Bernardino San Bernardino County	No
SB-06446	Chasteen, Carrie	2008	Determinations of Effect Report: sbX E Street Corridor Bus Rapid Transit (BRT) Project, Cities of Loma Linda and San Bernardino, San Bernardino County, California.	No
SB-06447	Chasteen, Carrie	2009	Addendum Cultural Resources Technical Report: sbX E Street Corridor BRT Project, Cities of San Bernardino and Loma Linda, San Bernardino County, California	No
SB-06994	**Sanka, Jennifer**	**2011**	**Cultural Resources Assessment: San Bernardino Redevelopment Project Area Merger —Area B Project, City of San Bernardino, San Bernardino County, California.**	**Yes**
SB-07959	Hatheway, Roger	1998	Determination of Eligibility for 50 Buildings in the City of San Bernadino	No

Studies within the Study Area are shown in Bold.

Additionally, the record search identified two (2) previously recorded resources within the 0.25-mile records search buffer, neither of which are mapped within the APE (Table 2).

Table 2. Cultural Resources Previously Recorded within 0.25 miles of the APE

Primary No.	Age	Description	Recording Events	In APE	Previous NRHP Evaluation
P-36-031700	H	Isolate-Glass	2015 (Blumel, W	No	Ineligible
P-36-031704	H	Little Mountain Dam	2015 (Blumel, W)	No	Ineligible

6.3. Native American Heritage Commission Sacred Lands File Search

On April 30, 2026, Aspen requested that the NAHC complete a search of its SLF to determine if resources significant to Native Americans have been recorded within 0.5-miles of the Project APE. On May 5, 2026, Aspen received a response from the NAHC stating that the results of the search of its SLF were positive (Attachment 1). The NAHC also suggested contacting specific tribes and provided an additional contact list of Native American tribal governments that might have information regarding cultural resources in the project area. The District is responsible for all outreach and tribal consultation.

7. RESEARCH DESIGN

Purpose and Regulatory Framework

The purpose of this research design is to establish an analytical framework for identifying, evaluating, and interpreting cultural resources that may be affected by the Proposed Project. The research design is intended to guide archival research, consultation, field investigation, resource documentation, significance evaluations, and assessment of Project effects in accordance with CEQA and, if the Project constitutes a federal undertaking, Section 106 of the NHPA.

Under CEQA, cultural resources may include buildings, structures, objects, sites, districts, archaeological deposits, cultural landscapes, tribal cultural resources, and other resources that may qualify as historical resources or unique archaeological resources. CEQA requires consideration of whether a project would cause a substantial adverse change in the significance of a historical resource, unique archaeological resource, or tribal cultural resource. Relevant requirements include PRC Sections 21074, 21083.2, and 21084.1; State CEQA Guidelines Section 15064.5; and the cultural and tribal cultural resources questions in Appendix G.

Section 106 of the NHPA applies when a project is carried out, funded, licensed, permitted, or approved by a federal agency and meets the definition of an "undertaking." Section 106 requires the responsible federal agency to consider the effects of the undertaking on properties listed in or eligible for listing in the NRHP, referred to as "historic properties," and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The Section 106 process is implemented through 36 CFR Part 800 and generally consists of initiating consultation, identifying and evaluating historic properties within the APE, assessing effects, and resolving adverse effects through consultation and mitigation. The goal is to identify opportunities to avoid, minimize, or mitigate adverse effects on historic properties. (ACHP; 36 CFR Part 800).

Although a single cultural resources investigation may support compliance with both CEQA and Section 106, the terminology, eligibility standards, consultation procedures, and effects findings required under the two processes are not interchangeable. Accordingly, the investigation will clearly distinguish between:

- Historical resources, unique archaeological resources, and tribal cultural resources considered under CEQA; and
- Historic properties listed in or eligible for listing in the NRHP and considered under Section 106.

The CEQA Project site and the Section 106 APE are synonymous and are collectively referred to as the APE for consistency.

The following research themes and questions will guide the investigation. The applicability of each question will depend on the type, age, condition, cultural context, and potential significance of the resources identified.

Precontact and Indigenous Land Use

Research concerning precontact and Indigenous resources will address the manner in which people used, understood, and adapted to the local environment over time. Relevant questions may include:

- What periods of human occupation are represented within the Project site or APE?
- Do identified materials contribute to refinement of the regional cultural chronology?
- What activities occurred at the resource, and was its use residential, temporary, ceremonial, or associated with resource procurement, processing, travel, trade, or other activities?

- How did settlement and land-use patterns relate to water sources, landforms, plant communities, animal resources, travel corridors, or other features of the natural and cultural landscape?
- What can recovered materials indicate regarding subsistence practices, food processing, seasonal mobility, or the duration and intensity of occupation?
- Do artifact materials, manufacturing techniques, or source materials provide information regarding technology, exchange networks, population movement, or interaction between cultural groups?
- Does the resource contribute to a larger site complex, archaeological district, cultural landscape, or pattern of Indigenous land use?
- Does the property possess religious or cultural significance to an Indian tribe or California Native American tribe?
- Does the resource retain culturally significant associations or values identified through tribal consultation?

Archaeological interpretation is not intended to define or limit the cultural significance of a resource to a California Native American tribe. Information concerning tribal cultural values, traditional practices, sacred places, cultural landscapes, and resource associations will be developed through appropriate government-to-government consultation and handled in accordance with applicable confidentiality requirements.

Historic-Period Archaeology

Research concerning historic-period archaeological resources will examine the relationship between material remains and documented patterns of settlement, transportation, agriculture, ranching, mining, industry, commerce, infrastructure development, or other locally relevant activities. Research questions may include:

- What historic activities or occupations are represented by the resource?
- Can the resource be associated with particular individuals, families, communities, businesses, cultural groups, or historical events?
- Does the resource provide information regarding household organization, consumer behavior, ethnicity, socioeconomic status, labor, gender, immigration, or community development?
- How did transportation systems, public utilities, extractive activities, agriculture, or industrial development influence the use of the Project area?
- Does the archaeological deposit contain information that is not adequately represented in documentary records?
- Does the resource represent an important or uncommon example of a particular historic activity, property type, or pattern of development?
- Does the resource contribute to an archaeological district, historic district, or broader cultural landscape?
- Does the resource retain intact deposits, spatial relationships, features, or datable materials necessary to address significant research questions?

Historic-period archaeological deposits will be evaluated based on their integrity, association with an important historical context, and ability to provide information relevant to specific and answerable research questions. Evaluation will not rely solely on the presence or absence of artifacts. The

investigation will consider the deposit's horizontal and vertical integrity, chronological resolution, feature associations, depositional history, and relationship to available documentary sources.

Historic-period archaeological resources may also qualify under criteria other than their information potential. For example, a resource may possess significant associations with an important event, development pattern, individual, community, or traditional cultural practice even if its archaeological data potential is limited.

Built Environment Resources

Buildings, structures, objects, districts, and cultural landscapes will be considered within appropriate historic contexts. Research will address:

- Is the resource associated with events or development patterns important to local, regional, state, or national history?
- Is the resource associated with a person who made demonstrably important contributions to history?
- Does the resource embody distinctive characteristics of a type, period, construction method, engineering practice, architectural style, or master designer or builder?
- Does the resource possess high artistic values or represent a significant and distinguishable entity?
- Does the resource form part of a historic district, cultural landscape, transportation system, utility system, or related group of properties?
- Does the resource have the potential to provide important information regarding historic construction, engineering, design, or land use?
- Does the resource retain sufficient integrity to convey its identified historical significance?

Integrity will be assessed through consideration of location, design, setting, materials, workmanship, feeling, and association. Alterations, additions, relocation, deterioration, replacement materials, and changes to the surrounding setting will be considered when determining whether a resource continues to convey its identified historical associations. The relative importance of each aspect of integrity will depend on the applicable eligibility criterion and the nature of the resource's significance.

Methods and Data Requirements

The research questions will be addressed through an appropriate combination of records searches, archival and historical research, review of maps and aerial photographs, tribal and consulting-party information, oral history, pedestrian survey, archaeological inventory, architectural reconnaissance, resource documentation, and analysis of identified cultural materials.

Identified resources will be documented on appropriate California Department of Parks and Recreation forms or other agency-approved forms. Documentation will identify the applicable historic context, character-defining features, contributing and noncontributing elements, integrity considerations, eligibility recommendations, and supporting evidence. Previously evaluated properties may be reconsidered when prior documentation is incomplete, the property has changed, new information has become available, or the passage of time has altered the applicable historic context.

Evaluation and Assessment of Effects

Evaluations will consider the CRHR criteria, NRHP criteria, applicable local-register criteria, and the provisions of CEQA governing historical resources, unique archaeological resources, and tribal cultural resources. For Section 106 purposes, NRHP eligibility recommendations will be submitted to the federal

agency for consultation with the SHPO or THPO and other consulting parties, as appropriate. The federal agency remains responsible for making Section 106 findings and determinations.

A resource's ability to address the research questions presented above will depend on whether it retains adequate integrity, contains interpretable cultural deposits or features, and can provide information beyond that already available from existing studies and documentary sources. If an archaeological resource cannot address important research questions because it lacks integrity, sufficient data, or a meaningful association with an identified historic or cultural context, it may have limited potential to qualify under CRHR Criterion 4 or NRHP Criterion D. Such a conclusion will not preclude consideration of the resource under the other CRHR or NRHP criteria or recognition of cultural values identified through tribal consultation.

Conversely, a resource that contains intact deposits, identifiable activity areas, datable materials, uncommon features, or information capable of addressing gaps in regional knowledge may warrant formal evaluation and additional management consideration. Resources that possess important historical, architectural, engineering, cultural, or tribal associations may also warrant evaluation regardless of their archaeological information potential.

For CEQA, the analysis will determine whether the Project could cause a substantial adverse change in the significance of a historical resource, unique archaeological resource, or tribal cultural resource. For Section 106, the analysis will apply the Criteria of Adverse Effect in 36 CFR Section 800.5 to historic properties within the APE. Section 106 findings may include "no historic properties affected," "no adverse effect," or "adverse effect," depending on the results of identification, evaluation, consultation, and effects assessment (36 CFR Section 800.5).

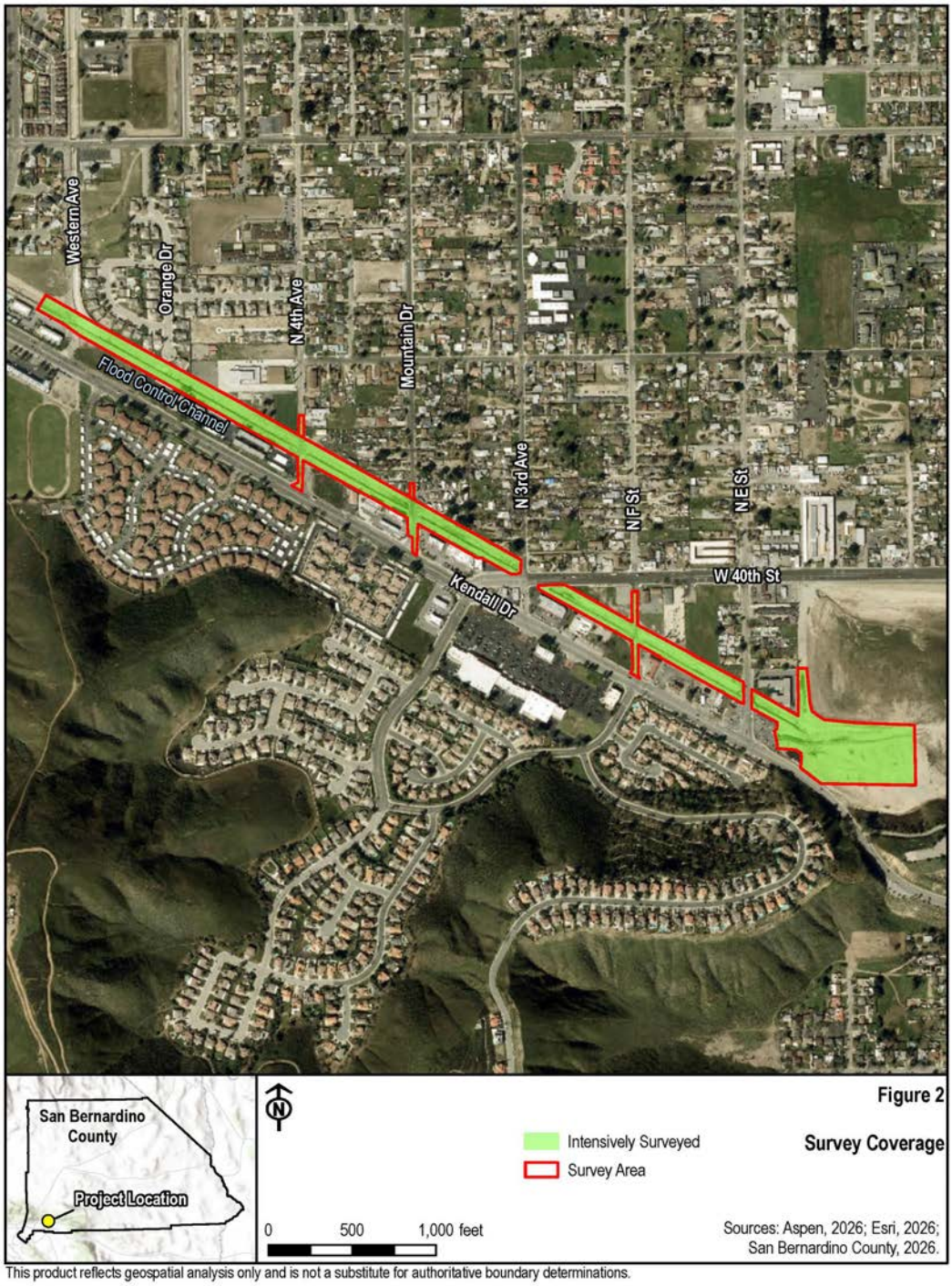
If significant resources or historic properties may be affected, avoidance will be considered first, where feasible. If avoidance is not feasible, measures to minimize or mitigate effects may be developed. Under CEQA, mitigation must be capable of reducing a significant impact and must satisfy applicable CEQA requirements. Under Section 106, adverse effects will be addressed through consultation among the federal agency, SHPO or THPO, Indian tribes, and other consulting parties and may be resolved through a memorandum of agreement, programmatic agreement, or other applicable compliance document. Completion of one process will not automatically satisfy the other unless the documentation, consultation, findings, and commitments fulfill the requirements of both.

8. SURVEY METHODS AND RESULTS

8.1. Methods

On July 13, 2026, Aspen Cultural Resources Specialist, Jenna Hollenbeck, B.A., surveyed the Proposed Project APE under the direction of Apsen's Principal Investigator, Lauren DeOliveira, and Aspen's Architectural Historian, Roger Hatheway. This included the North San Bernardino Channel (formerly known as Devil Creek Channel) north of Kendall Drive, from Western Avenue to Little Mountain Basin (approximately 1 mile) as shown in Figure 2 below. Transects varied according to ground surface but were no more than 15 meters and no less than 5 meters apart. The ground surfaces surveyed were inspected for elements of precontact and historic uses.

Figure 2. Survey Coverage Map



8.2. Results and Evaluations

8.2.1. Archaeological Survey Results

The archaeological survey did not identify any precontact or historic era archaeological resources within the APE.

8.2.2. Built Environment Survey Results

The built environment survey was also conducted by Jenna Hollenbeck on July 13, 2026, under the direction of Roger Hatheway, Aspen's Architectural Historian and built environment specialist. Select photographs were taken of the APE and surrounding environment.

Historical research and record search information has identified the Little Mountain Dam (P-36-031704) as a 45+ year old historic-age resource, previously determined with SHPO concurrence to not qualify as eligible to the CRHR or NRHP. A summary of this evaluation is provided below. The Little Mountain Dam includes both the Little Mountain Basin, and North San Bernardino Channel as features and a DPR 523 site record update was prepared to include the entire surveyed area (Attachment 3).

8.2.2.1. Evaluation of Little Mountain Dam

This resource was previously evaluated in 2015 as ineligible for both the CRHR and NRHP. Below is a summary of that evaluation. This resource consists of a flood control basin (Little Mountain Basin, P-36-031704) consisting of an earth dam, levees, an inlet channel (North San Bernardino Channel), a concrete spillway, and an outflow riser. For the purposes of this evaluation the basin and channel were resurveyed.

No significant historic events are known to be directly associated with Little Mountain Dam. Although periodic flooding contributed to the development of flood-control infrastructure in the San Bernardino Valley, these events were regional in scope and were not uniquely associated with the dam. The 1938 flood provided the final impetus for establishing the San Bernardino County Flood Control District; however, efforts to create a flood-control district had begun several decades earlier. Flood-control facilities throughout the valley generally reflect incremental and reactive improvements undertaken after flood events or in response to increasing water-conservation needs. Accordingly, Little Mountain Dam does not appear eligible for listing in the NRHP under Criterion A or the CRHR under Criterion 1.

No historically significant individuals are known to be directly associated with Little Mountain Dam. The facility was constructed by the San Bernardino County Flood Control District, a public agency whose development and operations are not closely associated with any specific person of recognized historical significance. Accordingly, Little Mountain Dam does not appear eligible for listing in the NRHP under Criterion B or the CRHR under Criterion 2.

San Bernardino County Flood Control District facilities throughout the San Bernardino Valley reflect varied construction periods, materials, methods, and facility types rather than a unified master plan. These facilities generally resulted from incremental improvements undertaken in response to periodic flooding and evolving water-conservation needs. Little Mountain Dam does not embody the distinctive characteristics of a type, period, or method of construction, nor does it represent the work of a master planner, architect, or engineer. Accordingly, Little Mountain Dam does not appear eligible for listing in the NRHP under Criterion C or the CRHR under Criterion 3.

Little Mountain Dam does not possess historical or engineering significance and has been adequately documented through the current investigation. The facility is unlikely to yield additional information important to understanding history or engineering. Accordingly, Little Mountain Dam does not appear eligible for listing in the NRHP under Criterion D or the CRHR under Criterion 4.

Aspen concurs with the previous assessment that Little Mountain Dam does not meet the criteria for listing in the NRHP or CRHR, therefore, this resource is not considered a historic property (Section 106) or a historical resource (CEQA).

9. SUMMARY AND RECOMMENDATIONS

The main goal of this investigation was to analyze if the Proposed Project would cause a significant adverse effect to any historical resources and historic properties. To this end, Aspen requested an NAHC SLF search, archaeological literature reviews and record searches, and completed an intensive archaeological and built environment field survey in support of the Proposed Project.

The SCCIC record search and literature review revealed eight (8) reports were previously prepared and two (2) sites were previously recorded within the 0.25-mile records search buffer of the Project APE. No cultural resources were identified by the SCCIC within the Project APE.

The NAHC completed a search of its SLF to determine if resources significant to Native Americans have been recorded within 0.25 miles of the Project APE. On May 5, 2026, Aspen received a response from the NAHC stating that the results of the SLF were positive. The NAHC also suggested contacting specific tribes and provided an additional contact list of Native American tribal governments that might have information regarding cultural resources in the project area. Tribal outreach and consultation remain the responsibility of the San Bernardino County Flood Control District.

No archaeological resources were identified during the field survey.

One built environment resource was identified, the Little Mountain Dam (P-36-031704), because features of this resource are located within the APE. The Little Mountain Dam has previously been determined by USACE with SHPO concurrence to not qualify as eligible to the NRHP or CRHR.

Therefore, implementation of the Proposed Project is not expected to result in a significant adverse effect, impact, change, or material impairment to any NRHP eligible cultural resources. Aspen's recommended finding of effect is no Historic Properties would be affected for Section 106 and no impacts to known historical resources, unique archaeological resources, or human remains for CEQA.

As with any project that involves ground disturbing activities, there is a possibility that inadvertent discoveries of cultural resources could be made. In the unlikely event cultural materials not identified or discussed herein are encountered during construction of the Project, Aspen recommends the following:

1. **Inadvertent Discovery of Cultural Resources.** A professional archaeologist meeting the Secretary of Interior qualifications should be contacted to identify and evaluate previously unidentified cultural resources discovered during construction activities. Upon inadvertent discovery of a potential resource, avoidance measures will be implemented by construction crews. These should include halting construction work within 100 feet of the find and directing construction away from the discovery until the archaeologist assesses the significance of the resource. The archaeologist will consult with the appropriate responsible public agency regarding necessary plans for treatment of the find(s), and for the evaluation and mitigation of impacts should the resource be significant/eligible to the NRHP or CRHR.
2. **Inadvertent Discovery of Human Remains.** In the event that human remains, or potential human remains are discovered, construction activities within 100-feet of the find shall be immediately halted. The construction Project Manager shall immediately notify the appropriate responsible public agency and the San Bernardino County Coroner. The San Bernardino County Coroner will make a determination as to the origin of the remains and, if determined to be of Native American origin, will contact the Native American Heritage Commission (NAHC) by telephone within 24 hours. If the remains are not of Native American origin, the County Coroner will make a determination as to the

disposition of the remains. Once contacted by the County Coroner, the NAHC shall immediately identify and notify the Most Likely Descendant (MLD). The MLD has 48 hours to make recommendations to the landowner for treatment or disposition of the human remains. If the descendant does not make recommendations within 48 hours, the appropriate responsible public agency shall reinter the remains in an area of the property secure from further disturbance. If the responsible public agency does not accept the descendant's recommendations, the appropriate responsible public agency or the descendant may request mediation by the NAHC. Construction may continue once compliance with all relevant sections of the California Health and Safety Code have been addressed and authorization to proceed is issued by the San Bernardino County Coroner and the responsible public agency.

10. REFERENCES

Aviña, R. H. (1976).

Spanish and Mexican land grants in California. Arno Press.

Bean, L. J., Smith, C. R., Vane, S. B., Lerch, M., & Young, J. (1981).

Native American places in the San Bernardino National Forest, San Bernardino and Riverside Counties, California (Vols. 1–2). Cultural Systems Research, Inc.

Bean, L. J., & Smith, C. R. (1978a).

Gabrielino. In R. F. Heizer (Ed.), Handbook of North American Indians: Vol. 8. California (pp. 538–549). Smithsonian Institution.

Bean, L. J., & Smith, C. R. (1978b).

Serrano. In R. F. Heizer (Ed.), Handbook of North American Indians: Vol. 8. California (pp. 570–574). Smithsonian Institution.

Bean, L. J., & Vane, S. B. (2002).

The Native Americans of Joshua Tree National Park: An ethnographic overview and assessment study. Cultural Systems Research, Inc. National Park Service

Bryant, K. L., Jr. (1974).

History of the Atchison, Topeka and Santa Fe Railway. Macmillan.

Byrd, B. F., & Raab, L. M. (2007).

Prehistory of the Southern Bight: Models for a new millennium. In T. L. Jones and K. A. Klar (Eds.), California prehistory: Colonization, culture, and complexity (pp. 215–228). AltaMira Press. https://doi.org/10.5040/9798881809232.ch-14

Castillo, E. D. (1978).

The impact of Euro-American exploration and settlement. In R. F. Heizer (Ed.), Handbook of North American Indians: Vol. 8. California (pp. 99–127). Smithsonian Institution.

City of San Bernardino. (2005).

City of San Bernardino general plan: Historical and archaeological resources. https://cdnsm5-hosted.civiclive.com/UserFiles/Servers/Server_17442462/File/Government/Department/Community%20%26%20Economic%20Development/Planning/Complete%20General%20Plan%20Compressed.pdf

Chartkoff, J. L., & Chartkoff, K. K. (1984).

The archaeology of California. Stanford University Press.

Cleland, R. G. (1941).

The cattle on a thousand hills: Southern California, 1850–1870. Huntington Library.

Dibblee, T. W., Jr. (1991).

Geologic map of the San Fernando and Van Nuys (north half) quadrangles, Los Angeles County, California (H. E. Ehrenspeck, Ed.; Dibblee Foundation Map DF-33; Scale 1:24,000). Dibblee Geological Foundation. https://ngmdb.usgs.gov/Prodesc/proddesc_217.htm

Dumke, G. S. (1944).

The boom of the eighties in Southern California. Huntington Library.

Dutcher, L. C., & Garrett, A. A. (1963).

Geologic and hydrologic features of the San Bernardino area, California—With special reference to underflow across the San Jacinto fault (U.S. Geological Survey Water-Supply Paper 1419). U.S. Government Printing Office. https://pubs.usgs.gov/wsp/1419/report.pdf

Gudde, E. G. (1969).

California place names: The origin and etymology of current geographical names (3rd ed.). University of California Press.

Gudde, E. G. (1998).

California place names: The origin and etymology of current geographical names (W. Bright, Rev.; 4th ed.). University of California Press.

Gunther, J. D. (1984).

Riverside County, California, place names: Their origins and their stories. Rubidoux Printing Company.

Heizer, R. F. (Ed.). (1968).

The Indians of Los Angeles County: Hugo Reid's letters of 1852 (Southwest Museum Papers No. 21). Southwest Museum.

Heizer, R. F. (Ed.). (1978).

Handbook of North American Indians: Vol. 8. California. Smithsonian Institution.

Hudson, T. (1971).

Proto-Gabrielino patterns of territorial organization in south coastal California. Pacific Coast Archaeological Society Quarterly, 7(2), 49–76.

Johnson, J. R., Stafford, T. W., Jr., Ajie, H. O., & Morris, D. P. (2002).

Arlington Springs revisited. In D. R. Browne, K. L. Mitchell, and H. W. Chaney (Eds.), Proceedings of the Fifth California Islands Symposium (pp. 541–545). Santa Barbara Museum of Natural History.

Jorgensen, L. (1982).

San Fernando Valley: Past and present. Pacific Rim Research.

Keller, J. S., & McCarthy, D. F. (1989).

Data recovery at the Cole Canyon Site (CA-RIV-1139), Riverside County, California. Pacific Coast Archaeological Society Quarterly, 25(1), 1–89.

Kroeber, A. L. (1925).

Handbook of the Indians of California (Bureau of American Ethnology Bulletin 78). U.S. Government Printing Office.

McCawley, W. (1996).

The first Angelinos: The Gabrielino Indians of Los Angeles. Malki Museum Press and Ballena Press.

Meighan, C. W. (1954).

A late complex in Southern California prehistory. Southwestern Journal of Anthropology, 10(2), 215–227.

Meltzer, D. J., Grayson, D. K., Ardila, G., Barker, A. W., Dincauze, D. F., Haynes, C. V., Mena, F., Núñez, L., & Stanford, D. J. (1997).

On the Pleistocene antiquity of Monte Verde, southern Chile. American Antiquity, 62(4), 659–663. https://doi.org/10.2307/281884

Mithun, M. (1999).

The languages of Native North America. Cambridge University Press.

Moratto, M. J. (1984).

California archaeology. Academic Press.

Morton, D. M., & Miller, F. K. (2003).

Preliminary geologic map of the San Bernardino 30′ × 60′ quadrangle, California (U.S. Geological Survey Open-File Report 03-293). U.S. Geological Survey. https://doi.org/10.3133/ofr03293

Mullaly, L., & Petty, B. (2002).

The Southern Pacific in Los Angeles, 1873–1996. Golden West Books.

National Oceanic and Atmospheric Administration. (2021).

U.S. climate normals 1991–2020. National Centers for Environmental Information. https://www.ncei.noaa.gov/access/us-climate-normals/

Pourade, R. F. (1961).

Time of the bells, 1769–1835 (The history of San Diego, Vol. 2). Union-Tribune Publishing Company. https://sandiegohistory.org/archives/books/bells/

Robertson, D. B. (1998).

Encyclopedia of western railroad history: Vol. 4. California. Caxton Printers.

Robinson, W. W. (1948).

Land in California: The story of mission lands, ranchos, squatters, mining claims, railroad grants, land scrip, and homesteads. University of California Press.

San Bernardino County. (2020).

San Bernardino Countywide Plan: County policy plan. https://countywideplan.sbcounty.gov/resources/document-download/

San Bernardino County. (2025).

County policy plan. https://countywideplan.sbcounty.gov/wp-content/uploads/sites/125/2026/01/CWP_PolicyPlan_HardCopy_MainText_Tables_2025_December.pdf

San Bernardino County. (2026).

San Bernardino County Code of Ordinances, Title 8, Chapter 82.12: Cultural Resources Preservation (CP) Overlay. American Legal Publishing. https://codelibrary.amlegal.com/codes/sanbernardino/latest/sanberncty_ca/0-0-0-168285

ertsonSchoenherr, A. A. (1992).

A natural history of California. University of California Press.

Strong, W. D. (1929).

Aboriginal society in Southern California. University of California Publications in American Archaeology and Ethnology, 26, 1–358.

Sutton, M. Q. (2009).

People and language: Defining the Takic expansion into Southern California. Pacific Coast Archaeological Society Quarterly, 41(2–3), 31–93.

Wallace, W. J. (1955).

A suggested chronology for Southern California coastal archaeology. Southwestern Journal of Anthropology, 11(3), 214–230. https://doi.org/10.1086/soutjanth.11.3.3629021

Warren, C. N. (1968).

Cultural tradition and ecological adaptation on the Southern California coast. In C. Irwin-Williams (Ed.), Archaic prehistory in the western United States (Eastern New Mexico University Contributions in Anthropology, Vol. 1, No. 3, pp. 1–15). Eastern New Mexico University

Attachment 1

NAHC RESULTS

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Isaac Bojorquez
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Pauma-Yuima Band of Luiseño Indians

COMMISSIONER
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COMMISSIONER
Vacant

EXECUTIVE SECRETARY
Andrew Alejandre
Paskenta Band of Nomlaki Indians

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

May 4, 2026

Michael Hoke
Aspen Environmental Group

Via Email to: Mhoke@aspen.eg

Re: San Bernardino Channel Project, San Bernardino County

To Whom It May Concern:

As requested, a 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 positive. Please contact the tribes on the attached list for more information. Be aware that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, an 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 that are traditionally and culturally affiliated with the project's geographic area. Please contact all of the listed tribes as they may have information about sacred sites within the project area that is not listed with the NAHC.

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 inform 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) 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 joshua.nowakowski@nahc.ca.gov

Sincerely,

Joshua Nowakowski

Joshua Nowakowski
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
5/1/2026

County	Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
San Bernardino	Agua Caliente Band of Cahuilla Indians	F	Lacy Padilla, Director of Historic Preservation/THPO	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	(760) 699-6919	ACBCI-THPO@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	1/11/2024
	Cahuilla Band of Indians	F	BobbyRay Esparza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	6/28/2023
	Cahuilla Band of Indians	F	Erica Schenk, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 590-0942	(951) 763-2808	chair@cahuilla-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	2/1/2024
	Cahuilla Band of Indians	F	Anthony Madrigal, Tribal Historic Preservation Officer	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		anthonymad2002@gmail.com	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	6/28/2023
	Fort Yuma Quechan Indian Tribe	F	Jonathan Koteen, President	P.O.Box 1899 Yuma, AZ, 85365	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	10/29/2025
	Fort Yuma Quechan Indian Tribe	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85365	(760) 919-3631		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	10/29/2025
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	12/4/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino/Tongva Nation	N	Sandonne Goad, Chairperson	13191 Crossroads Parkway North, Suite 375 City of Industry, CA, 91746	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	11/6/2025
	Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	1/28/2026
	Gabrielino-Tongva Tribe	N	Linda Candelaria, Chairperson	73465 Royal Palm Dr. #1 Palm Desert, CA, 92260	(626) 676-1184		gabrielinotongva1@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	1/28/2026
	Morongo Band of Mission Indians	F	Lena Broderick, Executive Assistant to Tribal Chairman	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110		lbroderick@morongo-nsn.gov	Cahuilla Serrano	Imperial,Kern,Los Angeles,Orange,Riverside,San Bernardino,San Diego,Ventura	11/21/2025

Native American Heritage Commission
Native American Contact List
San Bernardino County
5/1/2026

Morongo Band of Mission Indians	F	Bernadette Ann Brierty, Tribal Historic Preservation Officer	12700 Pumarra Road Banning, CA, 92220	(951) 663-2842		abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Kern,Los Angeles,Orange,Riverside,San Bernardino,San Diego,Ventura	11/21/2025
Morongo Band of Mission Indians	F	Charles Martin, MBMI Chairman	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110		chairman@morongo-nsn.gov	Cahuilla Serrano	Imperial,Kern,Los Angeles,Orange,Riverside,San Bernardino,San Diego,Ventura	11/21/2025
Santa Rosa Band of Cahuilla Indians	F	Steven Estrada, Tribal Chairman	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	sestrada@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	4/8/2024
Santa Rosa Band of Cahuilla Indians	F	Mercedes Estrada, Cultural Director	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	mestrada@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	5/21/2025
Santa Rosa Band of Cahuilla Indians	F	Vanessa Minott, Tribal Administrator	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	vminott@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	4/8/2024
Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(909) 578-2598		serranonation1@gmail.com	Serrano	Kern,Los Angeles,Riverside,San Bernardino	10/10/2023
Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(253) 370-0167		serranonation1@gmail.com	Serrano	Kern,Los Angeles,Riverside,San Bernardino	10/10/2023
Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Yuhaaviatam of San Manuel Nation	F	Alexandra McCleary, Director of Cultural Resources	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054		alexandra.mccleary@sanmanuel-nsn.gov	Serrano	Kern,Los Angeles,Riverside,San Bernardino	7/22/2025

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 San Bernardino Channel Project, San Bernardino County.

Record: PROJ-2026-002359
Report Type: List of Tribes
Counties: San Bernardino
NAHC Group: All

Attachment 2

REPRESENTATIVE PHOTOGRAPHS



Photo 1: Facing SE, overview taken from Little Mountain Dr.



Photo 2: Facing E, overview of channel accessed via Western Ave.


Photo 3: Facing NW, overview of channel accessed via Western Ave.


Photo 4: Facing SE, Newmark Groundwater Contamination Superfund Site Extraction Well no. 6.



Photo 5: Facing E, overview taken from N. 4th Ave.



Photo 6: Facing W, overview taken from N. 4th Ave.



Photo 7: Facing W, overview taken from Western Ave.



Photo 8: Facing W, overview taken from Mountain Dr.



Photo 9: Facing E, overview taken from Mountain Dr.



Photo 10: Facing NW, overview taken from 3rd Ave.



Photo 11: Facing W, overview taken from N. F St.



Photo 12: Facing E, overview taken from N. F St.



Photo 13: Facing NW, overview taken from H St.



Photo 14: Facing E, overview taken from overpass on H St.



Photo 15: Facing NW, overview taken from overpass on H St.



Photo 16: Facing NE, overview of Little Mountain Basin, accessed via German Auto Haus.



Photo 17: Facing W, overview of access point from H St.



Photo 18: Facing E, overview of access point from H St.



Photo 19: Facing E, overview taken from N. F St.



Photo 20: Facing W, overview taken from N. F St.

Appendix E

Noise Calculations

Noise Calculation, Construction Equipment & Stationary Source Noise

Project: North San Bernardino Channel Project

Model Description: Composite Noise Level Calc, Various Distances, No Shielding
Model Approach and Cite: General Assesessment: FTA, 2018: Transit Noise and Vibration Impact Assessment Guidelines. Section 7.1
Levels and Use Factors: FHWA, 2006: Roadway Construction Noise Model, User's Guide. Table 1 (Actual measured Lmax).

		Refc (ft) 32.81					
Construction Phase	**Equipment**	**Lmax @ Refc**	**Acoustic Use Factor**	**Refc Leq(h)**	**Recept @ (ft)**	**Item @ Recept Leq (dBA)**	**Composite @ Recept Leq (dBA)**
Clearing and Grubbing						Composite >>>>>>>>>>>>>>>	87
	Generator	81	50	78	15	85	3.0E+08
	Pickup Truck	75	40	71	45	68	6.7E+06
	Pickup Truck	75	40	71	45	68	6.7E+06
	Pickup Truck	75	40	71	45	68	6.7E+06
	Water Pump	81	50	78	45	75	3.3E+07
	Water Pump	81	50	78	45	75	3.3E+07
	Water Truck	80	50	77	45	74	2.7E+07
	Water Truck	80	50	77	45	74	2.7E+07
	Backhoe or Loader	79	40	75	45	72	1.7E+07
	Excavator	81	40	77	45	74	2.7E+07
Grading and Excavation						Composite >>>>>>>>>>>>>>>	89
	Pickup Truck	75	40	71	45	68	6.7E+06
	Pickup Truck	75	40	71	45	68	6.7E+06
	Pickup Truck	75	40	71	45	68	6.7E+06
	Water Truck	80	50	77	45	74	2.7E+07
	Water Truck	80	50	77	45	74	2.7E+07
	Dump Truck	76	40	72	45	69	8.5E+06
	Dump Truck	76	40	72	45	69	8.5E+06
	Grader	85	40	81	15	88	6.1E+08
	Excavator	81	40	77	45	74	2.7E+07
	Skidsteer	79	40	75	45	72	1.7E+07
	Front End Loader	80	40	76	45	73	2.1E+07
	Compactor	83	20	76	45	73	2.1E+07
	Backhoe or Loader	79	40	75	45	72	1.7E+07
	Backhoe or Loader	79	40	75	45	72	1.7E+07
Structural						Composite >>>>>>>>>>>>>>>	90
	Crane	81	20	74	45	71	1.3E+07
	Water Truck	80	50	77	45	74	2.7E+07
	Water Truck	80	50	77	45	74	2.7E+07
	All Other Equipment > 5 HP (Telehandler)	85	50	82	15	89	7.6E+08

	Generator	81	50	78	45	75	3.3E+07
	Grinder	85	40	81	45	78	6.7E+07
	Air Compressor	80	40	76	45	73	2.1E+07
	Concrete Saw	90	20	83	45	80	1.1E+08
	Skidsteer	79	40	75	45	72	1.7E+07
	Front End Loader	80	40	76	45	73	2.1E+07
	All Other Equipment > 5 HP (Street Sweeper)	80	30	75	45	72	1.6E+07
Road Work						Composite >>>>>>>>>>>>>>>	94
	Air Compressor	80	40	76	50	72	1.7E+07
	Concrete Saw	90	20	83	10	93	2.2E+09
	All Other Equipment > 5 HP (Street Sweeper)	80	30	75	50	71	1.3E+07
	Grinder	85	40	81	50	77	5.4E+07
	All Other Equipment > 5 HP (AC Dike Machine)	85	50	82	50	78	6.8E+07
	Paver	85	50	82	50	78	6.8E+07
	Roller	85	20	78	50	74	2.7E+07

Vibration Source Levels for Construction Equipment Greenbark 30 BESS Project

Project Number: XXXXXX

Model Approach and Cite: FTA, 2018: Table 7-4 and Eq. 7-2, 7-3.
Caltrans, 2020 = "Distinctly Perceptible" over 0.24 in/sec

Vibration Assessment, Individual Source

Reference Source (at 25 ft): PPV 0.644 in/sec , Pile Driver (impact, typical)
Reference Source (at 25 ft): Lv 104 VdB, Pile Driver (impact, typical)

	D (ft) =	ppv(eq) =	Damage Criterion (over 0.5 in/sec)	Riv Co 2015: annoying to people in buildings (over 0.2 in/sec)	Lv(D) =	Human Perceptibilty (over 65 Vdb)	Human Annoyance (over 80 VdB)
(ref)	25	0.644 in/sec	Yes	Yes	104.0 VdB	Yes	Yes
At 50 feet	50	0.228 in/sec	No	Yes	95.0 VdB	Yes	Yes
At 100 feet	100	0.081 in/sec	No	No	85.9 VdB	Yes	Yes
At 160 feet	160	0.040 in/sec	No	No	79.8 VdB	Yes	No
At 200 feet	200	0.028 in/sec	No	No	76.9 VdB	Yes	No
At 600 feet	600	0.005 in/sec	No	No	62.6 VdB	No	No

Vibration Assessment, Individual Source

Reference Source (at 25 ft): PPV 0.210 in/sec , Vibratory Roller (compactor)
Reference Source (at 25 ft): Lv 94 VdB, Vibratory Roller (compactor)

	D (ft) =	ppv(eq) =	Damage Criterion (over 0.5 in/sec)	Riv Co 2015: annoying to people in buildings (over 0.2 in/sec)	Lv(D) =	Human Perceptibilty (over 65 Vdb)	Human Annoyance (over 80 VdB)
(ref)	25	0.210 in/sec	No	Yes	94.0 VdB	Yes	Yes
At 50 feet	50	0.074 in/sec	No	No	85.0 VdB	Yes	Yes
At 100 feet	100	0.026 in/sec	No	No	75.9 VdB	Yes	No
At 200 feet	200	0.009 in/sec	No	No	66.9 VdB	Yes	No
At 600 feet	600	0.002 in/sec	No	No	52.6 VdB	No	No

Vibration Assessment, Individual Source

Reference Source (at 25 ft): PPV 0.089 in/sec , Large Bulldozer
Reference Source (at 25 ft): Lv 87 VdB, Large Bulldozer

	D (ft) =	ppv(eq) =	Damage Criterion (over 0.5 in/sec)	Riv Co 2015: annoying to people in buildings (over 0.2 in/sec)	Lv(D) =	Human Perceptibilty (over 65 Vdb)	Human Annoyance (over 80 VdB)
(ref)	25	0.089 in/sec	No	No	87.0 VdB	Yes	Yes
At 50 feet	50	0.031 in/sec	No	No	78.0 VdB	Yes	No
At 100 feet	100	0.011 in/sec	No	No	68.9 VdB	Yes	No

At 200 feet	200	0.004	in/sec	No	No	59.9	VdB	No	No
At 600 feet	600	0.001	in/sec	No	No	45.6	VdB	No	No

Vibration Assessment, Individual Source

Reference Source (at 25 ft): PPV 0.076 in/sec , Loaded Trucks

Reference Source (at 25 ft): Lv 86 VdB, Loaded Trucks

	D (ft) =	ppv(eq) =		Damage Criterion (over 0.5 in/sec)	Riv Co 2015: annoying to people in buildings (over 0.2 in/sec)	Lv(D) =		Human Perceptibilty (over 65 Vdb)	Human Annoyance (over 80 VdB)
(ref)	25	0.076	in/sec	No	No	86.0	VdB	Yes	Yes
At 50 feet	50	0.027	in/sec	No	No	77.0	VdB	Yes	No
At 100 feet	100	0.010	in/sec	No	No	67.9	VdB	Yes	No
At 200 feet	200	0.003	in/sec	No	No	58.9	VdB	No	No
At 600 feet	600	0.001	in/sec	No	No	44.6	VdB	No	No